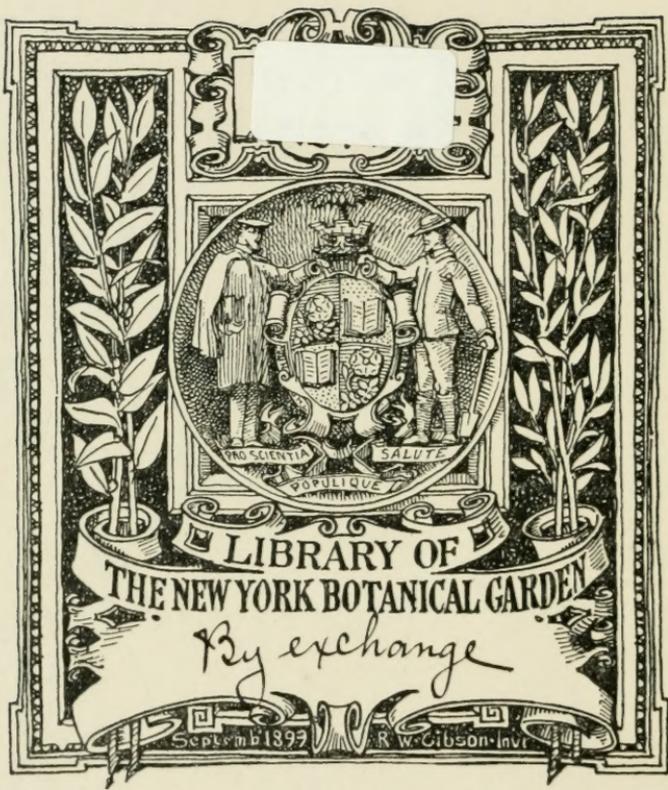


ANNUAL REPORT
OF THE
NEBRASKA
State Horticultural Society

1913

BY J. R. DUNCAN



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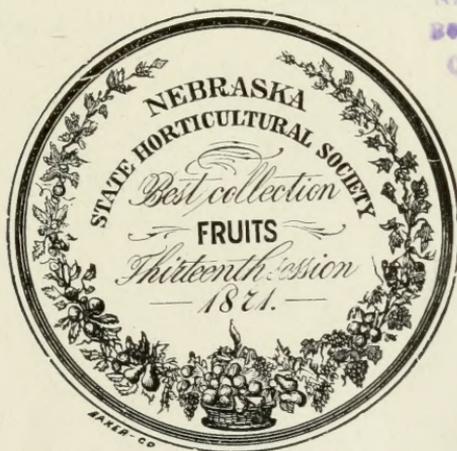
R. W. Gibson Invt

FORTY-FOURTH ANNUAL REPORT
OF THE
NEBRASKA
State Horticultural Society

Containing all the Proceedings of the Annual Meeting held at the Lindell
Hotel, Lincoln, January 21, 22 and 23, 1913.

By J. R. DUNCAN, Secretary
LINCOLN, NEBRASKA

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LINCOLN, NEB.
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1913

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1913

THE FORTY-FOURTH ANNUAL

REPORT

NEBRASKA

State Horticultural Society

Jacob North & Company
Printers and Binders
Lincoln, Neb.



LETTER OF TRANSMITTAL.

To His Excellency, John H. Morehead, Governor of Nebraska:

Sir—In compliance with legal requisition, the annual report of the Nebraska State Horticultural Society for the year 1913, with accompanying papers, is respectfully submitted.

J. R. DUNCAN,

Secretary Nebraska State Horticultural Society.

Lincoln, Sept. 1, 1913.

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JUL 26 1915

OFFICERS.

President	A. J. Brown, Geneva
First Vice-President	C. H. Barnard, Table Rock
Second Vice-President.....	L. Henderson, Omaha
Treasurer	Peter Youngers, Geneva
Secretary	C. G. Marshall, Lincoln

DIRECTORS.

J. A. Yager.....	Fremont
L. M. Russell	Lincoln
J. R. Duncan	Peru

STANDING COMMITTEES OF THE SOCIETY.

SYNONYMS.

G. A. Marshall, Arlington,
Val Keyser, Fairbury,
Ray W. Hesseltine, Peru.

PUBLICITY.

E. M. Pollard, G. A. Marshall, C. H. Barnard.

FORESTRY.

W. A. Harrison, York,
Peter Youngers, Geneva,
C. G. Marshall, Lincoln,
G. A. Marshall, Arlington.

ORNAMENTAL GARDENING.

W. H. Dunman, Lincoln.

FLORICULTURE.

C. H. Green, Fremont.

LEGISLATION.

Peter Youngers, Geneva,
G. A. Marshall, Arlington,
C. H. Barnard, Table Rock.

MEMBERSHIP.

J. A. Yager, Fremont.

MEMBERSHIP 1913.

HONORARY LIFE MEMBERS.

Beach, Prof. S. A.....	Ames, Iowa
Brackett, G. B.....	Washington, D. C.
Druner, Prof. L.	Lincoln
Burnett, Prof. E. A.	Lincoln
Campbell, G. W.	Delaware, Ohio
*Crouse, Lorenzo	Fort Calhoun
Earle, P.	Postoffice unknown
Garfield, C. W.	Grand Rapids, Mich.
Greene, Wesley	Des Moines, Iowa
Hansen, Prof. N. E.....	Brookings, S. D.
VanDeman, H. E.	3630 13th St., N. W., Washington, D. C.
VanHouton, George	Lenox, Iowa

ACTIVE LIFE MEMBERS.

Adams, W. R.	Omaha
Albert, U. G.	Normal
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Aldrich, Carl	Johnson
Alexander, A. A.....	Postoffice unknown
Alexander, G. W.	Julian, Nebr.
Allen, George L.....	Spicer, Oregon
Anderson, A. N.	Lincoln
Atkinson, J. E.....	Pawnee City
Backes, H. J.	Humphrey
Banks, E. H.....	Postoffice unknown
Barnard, C. H.	Table Rock
Bessey, Charles E.....	Lincoln
Bentz, P. J.	Llewellyn
Blessing, David S.....	4 Court St., Harrisburg, Pa.
Bliss, D. C.....	Minden
Blystone, W. J.	33d and Dudley Sts., Lincoln
Bowers, W. B.....	Postoffice unknown
Boyd, Chas. J.	Ainsworth

*Deceased.

Brown, A. J.	Geneva
Brown, Frank P.	Florence
Brown, Guy A.	Geneva
Bruning, W. H.	Cedar Bluffs
Camp, Charles B.	Cheney
Card, F. W.	Sylvania, Pa.
Carpenter, G. J.	Provo, Utah
Chapin, H. A.	Lincoln
Chapin, L. C.	Lincoln
Chowins, Charles E.	Lincoln
Christ, J. W.	Box 761, Lincoln
Christy, G. S.	Johnson
Christy, S. W.	Glendora, Cal.
Colvin, W. E.	Postoffice unknown
Coppoc, J. L.	Chambers
Corbin, E. E.	Grand Island
Courtright, W. J.	Fremont
Crawford, William	Postoffice unknown
Cross, F. B.	Lincoln
Damrow, Charles F.	Postoffice unknown
Davey, R. H.	Omaha
Davidson, J. R.	Aurora
Davidson, W. E.	Holdrege
Davies, William	Brownville
Davis, W. H.	Fullerton
Davis, Roy A.	Gibbon
DeFrance, C. Q.	Postoffice unknown
Deweber, H. N.	Pawnee City
Dillon, J. W.	Greeley, Colo.
Dole, E. W.	Beatrice
Dovel, O. P.	Auburn
Dugan, John	34 So. Logan Ave., Denver, Colo.
Duncan, J. R.	Peru
Dunkin, J. M.	Ravenna
Dunlap, J. P.	Dwight
Dunlap, N. C.	Address unknown
Dunman, W. H.	Lincoln
Eckley, Walter	Tekamah
Edinborough, Philip	Lincoln
Emerson, Prof. R. A.	Lincoln
Erfling, E. C.	1150 Sherman Ave., Omaha
Ernst, C. J.	1418 So. 10th St., Omaha
Ernst, William	Tecumseh
Field, B. E.	Fremont
Field, R. B.	Fremont
Floth, Paul	Omaha

Fox, B. C.	Lincoln
Fredenburg, B.	Manitou, Colo.
Frey, C. E.	Lincoln
Frey, C. H.	Lincoln
Frey, H. H.	Lincoln
Frey, Irvin	Lincoln
Frey, J. B.	Lincoln
Gage, J. A.	Beatrice
Gaiser, A.	Alliance
Galbraith, G. B.	Fairbury
Ganson, L. E.	Kearney
Good, E. E.	Peru
Green, C. H.	Fremont
Green, C. H. Jr.	Fremont
Green, Jos. N.	Fremont
Grennell, E. N.	Ft. Calhoun
Guerney, C. W.	Yankton, S. D.
Hadkinson, J. H.	Postoffice unknown
Haney, Chas.	639 No. 14th St., Lincoln
Harris, J. F.	Aurora
Harris, W. R.	Pomona City, Fla.
Harrison, C. S.	York
Harrison, Harry S.	York
Harrison, W. A.	York
Hartley, E. T.	Lincoln
Heald, Prof. F. D.	University of Pennsylvania, Philadelphia, Pa.
Heath, H. E.	Arno, Tex.
Helin, J. F.	1612 Farnam St., Omaha
Henderson, Lewis	Omaha
Hess, Jacob	Omaha
Hesseltine, Ray W.	Peru
Hesser, W. J.	Pasadena, Cal.
Hogg, J. A.	Shelton
Hornung, Ernest	Raymond
Hornung, G. J.	College View
Howe, H. R.	Auburn
Hurlburt, C. M.	Fairbury
Jackson, T. C.	Purdum
Jessup, J. G.	Clay Center
Kaar, Theodore	910 So. 13th St., Lincoln
Keyser, Val	Fairbury
Koopman, W. J.	Blair
Kretsinger, E. O.	Beatrice
Kuska, Val	Lincoln
Langdon, J. N.	Seward
Leonard, I. N.	Postoffice unknown

Loughry, James	Geneva
Lundeen, N P.	Alliance
Mackley, W. H.	Table Rock
Maiben, Ben	Palmyra
Marshall, A. C.	Arlington
Marshall, C. C.	Arlington
Marshall, C. G.	Nebraska City
Marshall, G. A.	Arlington
Marshall, H. W.	Arlington
Martin, Arnold	DuBois
Martin, F. R.	4622 Boulevard Ave., Omaha
Masters, J. W.	University Place
McComb, H. A.	McCook
McIntosh, H. F.	Alda
Meek, James	Talmage
Meek, John	Hamburg
Mellor, W. R.	Lincoln
Mergen, Philip	Omaha
Meyers, M. E.	Broken Bow
Moberg, F. O.	Omaha
Mohler, Wm.	Springer, N. M
Morsch, C. H.	Greeley Center
Mosher, D. C.	Eugene, Ore.
Mosher, P. C.	Wilber
Mott, Bert	Hastings
Murphey, P A.	Exeter
Nation, J. W.	Fremont
Neff, J. G.	Davey
Nemechek, Paul	Humboldt
Nownes, Charles	Papillion
Packwood, J M.	1345 A St., Lincoln
Parker, C. P.	Brock
Paulson, Paul	Omaha
Payne, Mrs. G. H.	Omaha
Pearson, James	Denton
Perin, S. W.	Lincoln
Perry, T. H.	Elk Creek
Peters, R. C.	4822 Cass St., Omaha
Peterson, Frank	811 First St. E., Calgary, Alberta, Can.
Peterson, John	Postoffice unknown
Pollard, E. M.	Nehawka
Pollard, Isaac	Nehawka
Randall, J. C.	Hamburg, Iowa
Reed, Mrs. J. H.	Blue Springs
Reed, M. H.	Postoffice unknown
Riley, Alfred	Greeley, Colo.

Roberts, E. A.	Albion
Rosenbaum, H. J.	Kennard
Russell, D. L.	Lincoln
Russell, J. D.	Lincoln
Russell, J. M.	Lincoln
Russell, L. M.	Lincoln
Sandoz, Jules	Spale
Saunders, Charles L.	211 So. 18th St., Omaha
Schamp, L. D.	Lincoln
Schumacher, A.	York
Shroyer, J. O.	Humboldt
Slayton, L. W.	Salem
Slayton, Geo. A.	192 Hillsdale St., Hillsdale, Mich.
Smith, E. E.	Lincoln
Smith, E. H.	York
Smith, H. L.	Geneva
Smith, O. F.	Blackfoot, Idaho
Stahl, J. L.	Puyallup, Wash.
Stenger, Albert	Columbus
Stephens, E. F.	Crete
Stevens, Frank G.	Nampa, Idaho
Stevenson, J. W.	North Bend
Stouffer, B. R.	Bellevue
Strand, G. A.	Minden
Swan, J. T.	Auburn
Swezey, Prof. G. D.	Lincoln
Tanahill, Wm.	Postoffice unknown
Taylor, F. W.	Address unknown
Tester, Harry S.	Blackfoot, Idaho
Tiffany, M. D.	Lincoln
Titus, G. N.	Nemaha
VanMetre, C. M.	Valentine
Walker, J. W.	Crete
Ward, James	Greeley
Warren, G. F.	Harvard
Watt, James	R. F. D. No. 5, Lincoln
Welch, G. L.	Fremont
Wileman, J. C.	Barada
Wheeler, D. H.	Omaha
Williams, Ed.	Grand Island
Williams, John	Tecumseh
Williams, L. O.	University Place
Williams, O. A.	Neligh
Williams, Theodore	Benson
Wilson, A. T.	Arcadia
Wilson, W. H.	Postoffice unknown

Woods, A. F.	Exp. Station, Minneapolis, Minn.
Wurtzel, John I.	Albion
Yager, J. A.	Fremont
Youngers, Peter	Geneva

HONORARY ANNUAL MEMBERS.

Héss, J. P.	Council Bluffs, Iowa
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ANNUAL MEMBERS.

Aldrich Geo. E.	Fairmont
Amm, L. L.	Plainview
Anderson, Henry	Elgin
Anderson, Roy C.	North Bend
Andreason, Geo.	Fremont
Auld, J. W.	Red Cloud
Backes, John J.	Humphrey
Barrett, J. W.	1313 So. 33d St., Omaha
Barrett, G. W.	Brunswick
Bates, Frank	Pauline
Boyle, V. G.	Table Rock
Beck, Prof. C. F.	Peru
Bennett, John N.	Crete
Billerbeck, A. G.	Humphrey
Blodgett, R. E.	Beatrice
Bohoc, Frank	Huntley
Bridenthal, L.	Wymore
Brown, Myron J.	Osceola
Burton, Eugene B.	Ford
Campbell, H. B.	Clay Center
Caldwell, A. W.	Elgin
Chase, Fred G.	Mason City
Christensen, Julius	Minden
Chambers, R. T.	Bennett
Claussen, A. E.	Beatrice
Coupe, J. F.	Walthill
Craig, J. S.	Leigh
Compton, O.	1736 Cherry St., Lincoln
Cross, Alex W.	Crawford
Cunningham, P. G.	Columbus
Delano, F. E.	Westerville
Dickinson, Chas.	Lincoln
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Dunmire	Lowell
Emerson, Geo.	Monroe

Ethell, D. S.	Ceresco
Faherty, P. J.	Greeley
Farrington, G.	Bancroft
Feddersen, Lauritz	Dannebrog
Fleming, C. G.	Phillips
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Funk, Louis	Havelock
Hastings, J. W.	Decatur
Havlicek, C. W.	Crete
Hersch, Henry	Nebraska City
Helm, C. A.	York
Hofmann, F. W.	Lincoln
Howard, R. F.	Univ. of Wis., Madison, Wis
Hubbard, F. W.	Alexandria
Huffman, J. R.	Auburn
Hughes, John W.	Hebron
Isaacs, C. W.	Falls City
Jenkins, M. B.	Downs, Kan.
Johnson, J. Alfred.	Ericson
Johnson, John P.	Newman Grove
Killy, W. L.	1030 So. 28th St., Omaha
Koupal, Frank	Ord
Knapp, F. S.	Omaha
Koenig, E. L.	Milford
Lasch, A. A.	1801 Sewell St., Lincoln
Laukota, James	Friend
Lawson, J. W.	York
Lee, C. M.	Falls City
Lueshen, John	Wisner
McIntosh, E. L.	Meadow Grove
Magee, Wayland W.	Bennington
Marshall, Roy E.	Lincoln
Marzolf C. G.	Kearney
Martin, Wade R.	Fremont
Matzner, Julius	Gresham
Mead, H. C.	Cozad
Melius, John M.	Cozad
Merrick, H. C.	Adams
Miles, F. C.	Lincoln
Moore, Wm.	Brownville
Moseley, I. W.	1626 E St., Lincoln
Mulligan, J. T.	Greeley
Neeley, Wm.	Nebraska City
Newell, C. E.	Elgin
Nields, C. A.	Florence
Olson, Niels	Leigh

Patrick, C. B.	Lincoln
Peterson, John C.	Plattsmouth
Pfaender, Max	Mandan, N. D.
Podlesak, Frank L.	Geneva
Powell, Allen L.	Sterling
Refshauge, J. J.	Marquette
Ress, Rev. Joseph	Steinauer
Richards, C. L.	Hebron
Ritchey	4704 No. 24th St., Omaha
Rollman, Albert A.	Madison
Roman, I. M.	3860 Davenport, Omaha
Sackett, L. L.	Tamora
Salter, G. B.	Norfolk
Sanders, G. E. N.	Brownville
Schrum, Jacob	Brayton
Saiser, Chas. B.	Ewing
Sherwood, Robt. W., Jr.	Plattsmouth
Shubert, L. W.	Shubert
Sheldon, Amsdel	Avoca
Sieber, Frank J.	Ohiowa
Singers, S. M.	500 West 7th St., York
Smith, N. L. D.	Red Cloud
Sprague, C. I.	Belgrade
Stauser, John B.	Red Cloud
Stires, A. R.	Fairbury
Swanson, H. G.	Ong
Thompson, H. S.	Kearney
Trotter, H. E.	Spalding
Troop, R. A.	Plattsmouth
Tulleys, P. A.	Bloomfield
Vogel, P. G.	Florence
Waldeck, W. H.	Salem
Walvoord, J. C.	Holland
Weitzel, F. M.	Albion
Welden, C. R.	Lincoln
Wendel, Chas.	Orchard
Wheeldon, Fred	Brownville
Whittaker, T. R.	Brownville
Williams, Frank	Tecumseh
Wundt, Karl R.	Boise, Idaho
Young, Andrew, Jr.	Craig
Zentner, H. P.	Brayton

CONSTITUTION.

ARTICLE I—Name.—This association shall be known as the Nebraska State Horticultural Society.

ARTICLE II—Object.—This society shall have for its object the promotion of pomology, arboriculture, floriculture, and gardening.

ARTICLE III—Membership.—The membership of this society shall consist of four classes, viz., active, associate, annual honorary, and life honorary. The active membership shall consist of persons practically engaged in fruit culture, forestry, floriculture, or gardening, who shall be admitted to life membership on the payment of a fee of \$5 at one time; to associate membership by the payment of a fee of \$1 annually. The honorary members shall consist of such persons as may be elected at any meeting of the society by a two-thirds vote of the members present, and shall have all the privileges and benefits of the society, except those of voting and holding office, which privileges shall belong exclusively to active members and to associate members who have been members of the society for twelve months and who shall have paid their second annual dues.

ARTICLE IV—Officers.—The officers of this society shall be a president, first and second vice-presidents, secretary, treasurer, and board of directors of seven members, said board consisting of the officers enumerated in this article, excepting a secretary, and three additional members. The officers, with the exception of the secretary, shall be elected by ballot at the annual meeting of the society in January. The secretary shall be elected by the executive board. The term of office of these officers, with the exception of directors, shall be for a period of one year, commencing on the first day of June following. One director shall be elected at the January meeting, 1906, for one year, one for two years, and one for three years, and afterwards every year, one director to serve three years.

ARTICLE V—Duties of President.—It shall be the duty of the president to preside at all meetings of the society, appoint all committees not otherwise provided for, countersign all orders drawn on the treasurer by the secretary; in conjunction with the secretary he shall arrange all programs for the meetings of the society, and perform such other duties as the society or board of directors may require.

ARTICLE VI—Duties of Vice-President.—The vice-presidents shall superintend all exhibits of the society, and in case of vacancy in the office of president at any meeting of the society or board of directors, shall perform all the functions of that office in the order of their rank.

ARTICLE VII—Duties of Secretary.—The secretary shall keep an accurate record of the proceedings of all meetings of the society and

board of directors, draw all warrants on the treasurer, and keep an accurate record of the same as countersigned by the president, prepare for publication and edit all reports of the society requiring publication by the statutes of the state; in conjunction with the president prepare all programs and make all other necessary arrangements for all meetings of the society.

ARTICLE VIII—Duties of Treasurer.—The treasurer shall be the custodian of all moneys belonging to the society, and shall pay from such funds all warrants drawn on him by the secretary and countersigned by the president.

ARTICLE IX—Duties of the Board of Directors.—The board of directors shall have general management of all the affairs of the society, for which no specific directors are otherwise provided in the constitution and by-laws.

ARTICLE X—Bonds of Officers.—The president and secretary shall each give a bond in the sum of \$5,000 and the treasurer in the sum of \$12,000 for the proper performance of his duties, which bond must be approved by the board of directors.

ARTICLE XI—Salaries of Officers.—The president, vice-president, treasurer, and members of the board of directors shall receive such per diem per day for their services in attendance upon the meetings of the society as the society or board of directors may from time to time determine. The board of directors shall pay the secretary an annual salary of \$1,900 if they deem best, in consideration of his keeping an open office and giving his whole time to the work, spending at least eight hours a day in his office. It shall be his duty to put out each year a creditable annual report, issue monthly bulletins to each member, prepare articles at least once a month for the leading papers, doing also his utmost to secure new members. This to be done with the advice and direction of the executive board.

ARTICLE XII—Reports of Officers.—The president, secretary and treasurer shall each present an annual report in writing at the January meeting of all the business matters pertaining to their respective offices during the annual term expiring at that time.

ARTICLE XIII—Meetings.—The society shall hold two or more meetings each year. The annual meeting shall be held in Lincoln on the third Tuesday in January as provided by statute, and the other meetings shall be held at the same time and place as the annual exhibition of the Nebraska State Board of Agriculture.

ARTICLE XIV—By-Laws.—By-laws not in conflict with the provisions of this constitution may be enacted by the society at any regular meeting.

ARTICLE XV—Amendments.—The constitution may be amended at January meetings of the society by a two-thirds vote of the members present, such amendments having been presented in writing and read before the society at a session preceding the one in which the vote is taken.

BY-LAWS.

1. All the officers of this society shall be elected at the January meeting, except the secretary, who shall be elected by the Board of Directors.

2. All officers of this society shall assume the duties of their respective offices on the first day of June following their election, and continue in office for the period of one year, or until their successors are elected and qualified.

3. The amount allowed the secretary for express, postage and stationery shall not exceed \$150 per annum, and it shall be the duty of the board of directors to employ a competent stenographer to report the proceedings of the meetings of the society, whose fee shall be paid by the society.

4. The first business of the society shall be on each morning the reading of the minutes of the previous day's proceedings, and submitting the same to the approval of the meeting.

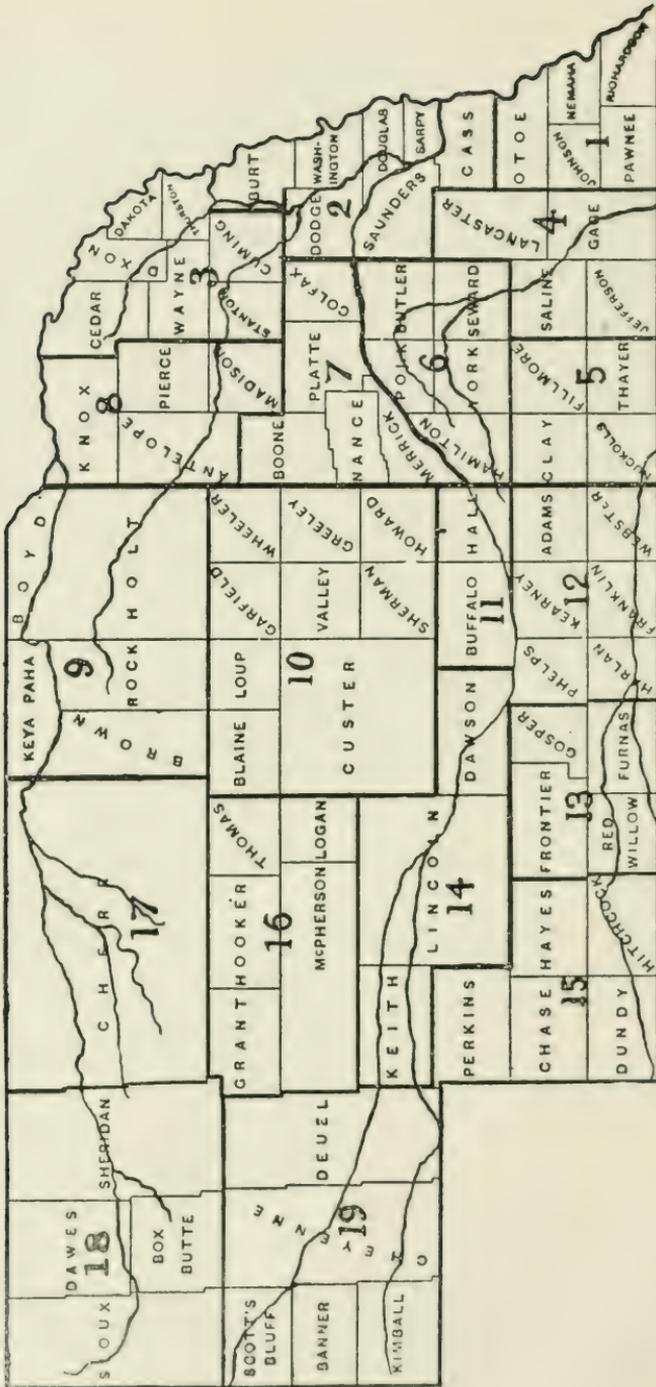
5. There shall be appointed by the board of directors nineteen district directors, one from each horticultural district in the state.

Also a standing committee of three on synonyms.

Also a standing committee of one on each of the following:

Meteorology in its relation to Horticulture, Entomology, Ornithology, Geology, Forestry, Vegetable Culture and Ornamental Gardening.

6. These by-laws may be amended at any general meeting of the society by a majority of the members present.



HORTICULTURAL DISTRICTS OF THE STATE.

REPORT OF COMMITTEE ON REDISTRICTING THE STATE.

We, your committee to whom was referred the matter of redistricting the state and revision of the list of fruits and ornamentals recommended for general planting in Nebraska, beg to submit the following report:

For District No. 1, comprising Richardson, Nemaha, Otoe, Johnson, and Pawnee counties, we recommend the following for general planting:

APPLES: Summer—Duchess, Cooper's Early White, Cole's Quince, Early Harvest, and Sweet June. For second choice we recommend Red Astrachan. Autumn—Wealthy, Maiden's Blush, Fameuse, Dyer, and Warfield. Winter—Grimes' Golden, Winesap, Jonathan, Gano, Ben Davis, Salome, N. W. Greening, Missouri Pippin, and Virginia Beauty.

BLACKBERRIES: Snyder and Early Harvest.

CHERRIES: Early Richmond, Montmorency, and English Morello.

CRAB-APPLES: Whitney No. 20, Hyslop, and Siberian.

CURRENTS: Red Dutch, Victoria and White Grape.

GOOSEBERRIES: Downing, Houghton, Industry, and Red Jacket.

GRAPES: Concord, Worden, Moore's Early, Niagara, Moore's Diamond, and Woodruff Red.

PEACHES: Alexander, Early Rivers, Triumph, Hale's Early, Russell, Champion, Crosby, Hill's Chili, Heath Cling, Salway and Wright.

PEARS: Kieffer, Bartlett, Sheldon and Seckel.

PLUMS: American—Forest Garden, Wild Goose, and Weyant. Japanese—Abundance and Burbank.

RASPBERRIES: Cumberland, Kansas, Gregg, Nemaha, Turner (Red), and Cardinal (Purple).

STRAWBERRIES: Senator Dunlap, Splendid, Bederwood, Crescent, Gandy, and August Luther.

For District No. 2, comprising Cass, Sarpy, Douglas, Washington, Burt, Dodge, and Saunders counties, we recommend the following for general planting:

APPLES: Summer—Duchess, Yellow Transparent, Cole's Quince, Dyer, Sweet June, Red Astrachan, Red June, Chenango, Strawberry, Early Pennock, Early Harvest, American Summer Pearmain, Benoni, and Summer Hagloe. Autumn—Wealthy, Utter's Red, Maiden's Blush, Ramsdell Sweet, Fulton Strawberry, Flora Belle, Plumb's Cider, Fameuse, Warfield, Porter, Fulton and McMahon's White. Winter—Ben Davis, Gano, Winesap, Windsor, Jonathan, Grimes' Golden, Janet, N. W. Greening, Salome, Ingram, Black Twig, and Isham Sweet. For second choice we recommend Missouri Pippin and Iowa Blush.

APRICOTS: Alexis, Budd, and Moorpark.

BLACKBERRIES: Snyder.

CHERRIES: Early Richmond, Montmorency, English Morello, and Dyehouse.

CRAB-APPLES: Whitney No. 20, Hyslop, Florence, and Martha.

CURRENTS: Victoria, Cherry, White Grape, Fay's Prolific, and North Star.

GOOSEBERRIES: Downing, Houghton, and Champion.

GRAPES: Concord, Worden, Moore's Early, Agawam, Brighton, Pocklington, Moore's Diamond, and Woodruff Red.

PEACHES: Alexander, Early Rivers, Triumph, Russell, Champion Bokara, and Wright for general planting in Cass and Sarpy counties, and for trial in balance of district.

PEARS: Kieffer, Flemish Beauty, Sheldon, Duchess, and L. B. De Jersey.

PLUMS: American—Wild Goose, Wyant, Wolf, Stoddard, Hawkeye, DeSoto, Forest Garden. European—Lombard, Shipper's Pride, Green Gage, Shrop, and Damson. For trial, Japanese—Burbank, Abundance, and Wickson.

RASPBERRIES: Nemaha, Kansas, Palmer, and Cumberland.

STRAWBERRIES: Senator Dunlap, Splendid, Bederwood, Crescent, Sample and Warfield.

For District No. 3 comprising Stanton, Thurston, Wayne, Dakota, Dixon, and Cedar counties, we recommend the following for general planting.

APPLES: Summer—Yellow Transparent, Duchess, Cooper's Early choice, Red Astrachan and Sweet June. For trial, Summer Hagloe. Autumn—Wealthy, Utter's Red, Flora Belle, Fameuse, and Ramsdell Sweet. For second choice, Maiden's Blush and Plumb's Cider. For trial, Warfield and McMahon's White. Winter—First choice for entire district, N. W. Greening, Salome, and Janet. First choice for south half of district, Ben Davis, Gano, and Winesap. Second choice for entire district, Iowa Blush and Missouri Pippin. For trial, Windsor.

BLACKBERRIES: Snyder.

CHERRIES: Early Richmond, Montmorency, and English Morello. For trial, Terry, Baldwin, and Ostheim.

CRAB-APPLES: Whitney No. 20, Hyslop, Florence, and Martha.

CURRENTS: Victoria, White Grape, Cherry, and Fay's Prolific.

GOOSEBERRIES: Downing, Houghton, and Champion.

GRAPES: Concord, Worden, Moore's Early, and Pocklington. For trial, Brighton, Agawam, and Moore's Diamond.

PEACHES: Alexander, Triumph, Champion, Bokara, and Wright for trial only.

PEARS: Kieffer, Flemish Beauty, Sheldon, Duchess, and L. B. De Jersey for trial only.

PLUMS: American—Wyant, Wolf, Wild Goose, Forest Garden, and

DeSoto. European—Lombard, Shipper's Pride, and Green Gage. First choice for south half of district, Wild Goose. For trial in entire district, Japanese—Burbank and Abundance.

RASPBERRIES: Nemaha, Kansas, Palmer, Columbia, and Cumberland.

STRAWBERRIES: Senator Dunlap, Splendid, Bederwood, Crescent, Sample, and Warfield.

For District No. 4, comprising Gage, Jefferson, Saline, and Lancaster counties, we recommend the following for general planting:

APPLES: Summer—Yellow Transparent, Duchess, Cooper's Early White, Early Harvest, Red June, and Sweet June. Autumn—Wealthy, Maiden's Blush, Fameuse, and Utter's Red. Winter—Ben Davis, Gano, Winesap, Jonathan, Grimes' Golden, Missouri Pippin, and N. W. Greening.

BLACKERRIES: Snyder and Early Harvest.

CHERRIES: Early Richmond, Montmorency, and English Morello.

CRAB-APPLES: Whitney No. 20, Hyslop, Florence, Martha, Red and Yellow Siberian.

CURRANTS: Red Dutch, Victoria, and White Grape.

GOOSEERRIES: Downey, Houghton, and Industry.

GRAPES: Concord, Worden, Moore's Early, and Niagara.

PEACHES: Alexander, Early Rivers, Triumph, Hale's Early, Russell, Champion, Crosby, Hill's Chili, Heath's Cling, Salway, and Wright.

PEARS: Duchess, Flemish Beauty, and Seckel.

PLUMS: American—Wyant, Hawkeye, Wild Goose, and Forest Garden. Japanese—Burbank.

RASPBERRIES: Kansas, Palmer, Gregg, and Turner.

STRAWBERRIES: Senator Dunlap, Splendid, Bederwood, Crescent, and Gandy.

For District No. 5, comprising Thayer, Nuckolls, Fillmore, and Clay counties, we recommend the following for general planting:

APPLES: Summer—Duchess, Cooper's Early White, Cole's Quince, Early Harvest, Red June, and Sweet June. Autumn—Maiden's Blush, Wealthy, Fameuse, Dyer, and Warfield. Winter—Ben Davis, Gano, Winesap, Jonathan, Grimes' Golden, Janet, and Missouri Pippin.

BLACKBERRIES: Snyder.

CHERRIES: Early Richmond, Montmorency, English Morello, and Dyehouse.

CRAB-APPLES: Whitney No. 20, Hyslop, Florence, and Martha.

CURRANTS: Cherry, LaVersailles, Victoria, Prince Albert, London Market, Red Dutch, and White Grape.

DEWBERRIES: Lucretia.

JUNEBERRIES: Dwarf.

GOOSEBERRIES: Downing and Houghton.

GRAPES: Concord, Worden, Moore's Early, Duchess, Agawam, and Brighton.

PEACHES: Amsden, Alexander, Hale's Early, Early Rivers, Russell,

Cooledge, Champion, Triumph, Heath, C'ling, Wright, Smock, and Hill's Chili.

PEARS: Flemish Beauty and Bartlett.

PLUMS: American—Wild Goose, Minor, Forest Garden, Wolf, Wyant, DeSoto, and Hawkeye. European—Lombard.

RASPBERRIES: Kansas, Palmer, and Nemaha.

STRAWBERRIES: Senator Dunlap, Clyde, Bederwood, Crescent, and Warfield.

For District No. 6, comprising Seward, Butler, Polk, York, and Hamilton counties, we recommend the following for general planting:

APPLES: Summer—Yellow Transparent, Early Harvest, Cooper's Early White, Red June, Duchess, Summer Queen, and Sweet June. Autumn—Wealthy, Maiden's Blush, Utter's Red, Patton's Greening, Wolf River, Peerless and Snow. Winter—Winesap, Missouri Pippin, Ben Davis, N. W. Greening, Janet, Salome, Walbridge, Ingram, M. B. Twig, Gano, Jonathan, Iowa Blush, Grimes' Golden, York Imperial, Minkler, and Rome Beauty.

APRICOTS: Russian.

ASPARAGUS: Conover's Colossal and Palmetto.

BLACKBERRIES: Snyder.

CHERRIES: Early Richmond, Dyehouse, Large Montmorency, English Morello, and Ostheim.

CRAB-APPLES: Whitney No. 20, Florence, Martha, Golden Beauty, Hyslop, and Transcendent.

CURRENTS: Victoria, Cherry, Versailles, and White Grape.

DEWBERRIES: Lucretia.

JUNEBERRIES: Dwarf.

GOOSEBERRIES: Downing and Pearl.

GRAPES: Concord, Worden, Moore's Early, Elvira, Niagara, Wyoming Red and Pocklington.

PEACHES: Alexander, Early Rivers, Triumph, Hale's Early, Russell, Champion, Crosby, Hill's Chili, Wright and Bokara.

PEARS: Flemish Beauty, Seckel, Duchess, and Lincoln.

PLUMS: American—Wyant, Wolf, Weaver, DeSoto, Forest Garden, Stoddard, Cheney, and Hawkeye. European—Lombard, German Prune, and Tagge. Japanese—Burbank and Wickson.

RASPBERRIES: Cumberland, Kansas, Gregg, and Ohio.

RHUBARB: Linnaeus and Victoria.

STRAWBERRIES: Senator Dunlap, Warfield, Sample, Aroma, and Haverland.

For District No. 7, comprising Colfax, Platte, Boone, Nance, and Merrick counties, we recommend the following for general planting:

APPLES: Summer—Yellow Transparent and Duchess. For second choice, Sweet June. For trial, Summer Hagloe. Autumn—Wealthy, Utter's Red, Ramsdell Sweet. For second choice, Plumb's Cider, Flora Belle, Fameuse, and Maiden's Blush. For trial, Warfield. Winter—Ben

HORTICULTURAL DISTRICT

and, Large Montmorency, English Morello, Davis, Gano, Winesap, Janet, Blush, and Missouri Pippin. Key No. 20, Florence, Martha, Golden Beauty, APRICOTS: Fully a

BLACKBERRIES: Gria, Cherry, Versailles, and White Grape. localities. Snyder, and Lucretia.

CERRIES: Ear Dwarf. trial, Dyehouse, Balis: Downing and Houghton.

CRAB-APPLES: Concord, Worden, Moore's Early, Elvira, Niagara, and CURRANTS: GOOSEBERRY: Alexander, Triumph, Russell, Bokara, Hill's Chili, GRAPES: right.

second choice For trial only, Flemish Beauty, Seckel, Duchess, and Lin- PEACH

Wright forS: American—Wyant, Wolf, Weaver, DeSoto, Forest Garden, PEACH, Cheney, and Hawkeye. Japanese—Burbank and Wickson. DeJers (SPBERRIES: Cumberland, Kansas, Gregg and Ohio.

PHUBARB: Linnaeus and Victoria. EuroSTRAWBERRIES: Senator Duniap, Sample, Warfield, Aroma, Haveseand, and Crescent.

For District No. 11, comprising Hall and Buffalo counties, we recommend the following for general planting:

APPLES: Summer—Yellow Transparent, Early Harvest, Cooper's Early White, Red June, Duchess, and Sweet June. Autumn—Wealthy, Maiden's Blush, Utter's Red, Patton's Greening, Wolf River, and Snow. Winter—Winesap, Missouri Pippin, Ben Davis, N. W. Greening, Janet, Salome, Walbridge, M. B. Twig, Gano, Jonathan, Iowa Blush, Grimes' Golden and York Imperial.

APRICOTS: Russian varieties.

ASPARAGUS: Conover's Colossal and Palmetto.

BLACKBERRIES: Snyder.

CERRIES: Early Richmond, Large Montmorency, English Morello, Baldwin, Dyehouse, and Ostheim.

CRAB-APPLES: Whitney, No. 20, Florence, Martha, Golden Beauty, and Hyslop.

CURRANTS: Victoria, Cherry, Versailles, and White Grape.

DEWBERRIES: Lucretia.

JUNEBERRIES: Dwarf.

GOOSEBERRIES: Downing and Houghton.

GRAPES: Concord, Worden, Moore's Early, Elvira, Niagara, Wyoming Red, and Pocklington.

PEACHES: Alexander, Early Rivers, Triumph, Hale's Early, Russell, Champion, Crosby, Hill's Chili, Wright, and Bokara.

PEARS: For trial only, Flemish Beauty, Seckel, Duchess, and Lincoln.

PLUMS: American—Wolf, Weaver, DeSoto, Forest Garden, Stod-

HORTICULTURAL SOCIETY

Cooledge, Champion, Triumph, Heath Ch.

Chili.

as first choice for entire district.

PEARS: Flemish Beauty and Bartlett. Forest Garden, and Stoddard.

PLUMS: American—Wild Goose, Minor, Goose. For trial in entire Wyant, DeSoto, and Hawkeye. European—Lombard Green Gage.

RASPBERRIES: Kansas, Palmer, and Nemaha. For trial in bal-

STRAWBERRIES: Senator Dunlap, Clyde, Bederland, and Columbia. and Warfield.

For District No. 6, comprising Seward, Butler, Polk, Warfield, Bederwood, and Lincoln counties, we recommend the following for general planting:

APPLES: Summer—Yellow Transparent, Early Har Paha, Brown, and Early White, Red June, Duchess, Summer Queen, and Sweet planting: Autumn—Wealthy, Maiden's Blush, Utter's Red, Patton's Gree, and Summer River, Peerless and Snow. Winter—Winesap, Missouri Pie, Utter's Red Davis, N. W. Greening, Janet, Salome, Walbridge, Ingram, M. Rome, N. W. Gano, Jonathan, Iowa Blush, Grimes' Golden, York Imperial, M. Davis. and Rome Beauty.

APRICOTS: Russian.

Ohio, and

ASPARAGUS: Conover's Colossal and Palmetto.

BLACKBERRIES: Snyder.

Ohio.

CHERRIES: Early Richmond, Dychouse, Large Montmorency, Eng. and Irish Morello, and Ostheim.

CRAB-APPLES: Whitney No. 20, Florence, Martha, Golden Beauty, Hyslop, and Transcendent.

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CURRENTS: Victoria, Cherry, Versailles, and White Grape.

DEWBERRIES: Lucretia.

JUNE BERRIES: Dwarf.

GOOSEBERRIES: Downing and Pearl.

GRAPES: Concord, Worden, Moore's Early, Elvira, Niagara, Wyoming Red and Pocklington.

PEACHES: Alexander, Early Rivers, Triumph, Hale's Early, Russell, Champion, Crosby, Hill's Chili, Wright and Bokara.

PEARS: Flemish Beauty, Seckel, Duchess, and Lincoln.

PLUMS: American—Wyant, Wolf, Weaver, DeSoto, Forest Garden, Stoddard, Cheney, and Hawkeye. European—Lombard, German Prune, and Tagge. Japanese—Burbank and Wickson.

RASPBERRIES: Cumberland, Kansas, Gregg, and Ohio.

RHUBARB: Linnaeus and Victoria.

STRAWBERRIES: Senator Dunlap, Warfield, Sample, Aroma, and Haverland.

For District No. 7, comprising Colfax, Platte, Boone, Nance, and Merrick counties, we recommend the following for general planting:

APPLES: Summer—Yellow Transparent and Duchess. For second choice, Sweet June. For trial, Summer Hagloe. Autumn—Wealthy, Utter's Red, Ramsdell Sweet. For second choice, Plumb's Cider, Flora Belle, Fameuse, and Maiden's Blush. For trial, Warfield. Winter—Ben

CHERRIES: Early Richmond, Large Montmorency, English Morello, Baldwin, Dyehouse, and Ostheim.

CRAB-APPLES: Whitney No. 20, Florence, Martha, Golden Beauty, and Hyslop.

CURRENTS: Victoria, Cherry, Versailles, and White Grape.

DEWBERRIES: Lucretia.

JUNE-BERRIES: Dwarf.

GOOSEBERRIES: Downing and Houghton.

GRAPES: Concord, Worden, Moore's Early, Elvira, Niagara, and Wyoming Red.

PEACHES: Alexander, Triumph, Russell, Bokara, Hill's Chili, Crosby, and Wright.

PEARS: For trial only, Flemish Beauty, Seckel, Duchess, and Lincoln.

PLUMS: American—Wyant, Wolf, Weaver, DeSoto, Forest Garden, Stoddard, Cheney, and Hawkeye. Japanese—Burbank and Wickson.

RASPBERRIES: Cumberland, Kansas, Gregg and Ohio.

RHUBARB: Linnaeus and Victoria.

STRAWBERRIES: Senator Duniap, Sample, Warfield, Aroma, Haverland, and Crescent.

For District No. 11, comprising Hall and Buffalo counties, we recommend the following for general planting:

APPLES: Summer—Yellow Transparent, Early Harvest, Cooper's Early White, Red June, Duchess, and Sweet June. Autumn—Wealthy, Maiden's Blush, Utter's Red, Patton's Greening, Wolf River, and Snow. Winter—Winesap, Missouri Pippin, Ben Davis, N. W. Greening, Janet, Salome, Walbridge, M. B. Twig, Gano, Jonathan, Iowa Blush, Grimes' Golden and York Imperial.

APRICOTS: Russian varieties.

ASPARAGUS: Conover's Colossal and Palmetto.

BLACKBERRIES: Snyder.

CHERRIES: Early Richmond, Large Montmorency, English Morello, Baldwin, Dyehouse, and Ostheim.

CRAB-APPLES: Whitney, No. 20, Florence, Martha, Golden Beauty, and Hyslop.

CURRENTS: Victoria, Cherry, Versailles, and White Grape.

DEWBERRIES: Lucretia.

JUNE-BERRIES: Dwarf.

GOOSEBERRIES: Downing and Houghton.

GRAPES: Concord, Worden, Moore's Early, Elvira, Niagara, Wyoming Red, and Pocklington.

PEACHES: Alexander, Early Rivers, Triumph, Hale's Early, Russell, Champion, Crosby, Hill's Chili, Wright, and Bokara.

PEARS: For trial only, Flemish Beauty, Seckel, Duchess, and Lincoln.

PLUMS: American—Wolf, Weaver, DeSoto, Forest Garden, Stod-

dard, Cheney, and Hawkeye. European—Lombard, German Prune. Japanese—Burbank and Wickson.

RASPBERRIES: Cumberland and Kansas.

RHUBARB: Linnaeus and Victoria.

STRAWBERRIES: Senator Dunlap, Sample, Warfield, Aroma, Hav-
erland and Bederwood.

For District No. 12, comprising Adams, Webster, Franklin, Kearney, Phelps and Harlan counties, we recommend the following for general planting:

APPLES: Summer—Yellow Transparent, Early Harvest, Cooper's Early White, and Duchess. Autumn—Wealthy, Utter's Red, and Plumb's Cider. Winter—Winesap, Missouri Pippin, Ben Davis, N. W. Greening, Salome, Gano, Jonathan, Iowa Blush, Grimes' Golden, and Janet.

APRICOTS: Russian.

ASPARAGUS: Conover's Colossal and Palmetto.

BLACKBERRIES: Snyder.

CHERRIES: Early Richmond, Large Montmorency, English Morello, Baldwin, Dyehouse, and Ostheim.

CRAB-APPLES: Whitney No. 20, Florence, and Martha.

CURRENTS: Victoria, Cherry, Versailles, White Grape, White Dutch, and Fay's Prolific.

DEWBERRIES: Lucretia.

JUNEBERRIES: Dwarf.

GOOSEBERRIES: Downing and Houghton.

GRAPES: Concord, Worden, Moore's Early, Elvira, Niagara, Wyoming Red, and Pocklington.

PEACHES: Alexander, Early Rivers, Triumph, Hale's Early, Champion, Crosby, Hill's Chili, Wright, and Cooledge.

PEARS: For trial only; Flemish Beauty, Seckel, and Kieffer.

PLUMS: American—Wyant, Wolf, Weaver, DeSoto, Forest Garden, Stoddard, Cheney, Hawkeye, Wild Goose, Robinson, and Pottawattamie. Japanese—Burbank and Wickson.

RASPBERRIES: Cumberland and Kansas.

STRAWBERRIES: Senator Dunlap, Sample, Warfield, Aroma, Hav-
erland, and Crescent.

For District No. 13, comprising Furnas, Gosper, Frontier, and Red Willow counties, we recommend the following for general planting:

APPLES: Summer—Duchess and Cooper's Early White. Autumn—Wealthy and Maiden's Blush. Winter—Winesap, Missouri Pippin, Janet, Ben Davis, and Gano.

APRICOTS: Russian.

CHERRIES: Early Richmond, Dyehouse, Large Montmorency, and English Morello.

CRAB-APPLES: Whitney and Florence.

CURRENTS: Victoria, Cherry, Versailles, and White Grape.

GOOSEBERRIES: Downing and Houghton.

GRAPES: Concord and Elvira.

PEACHES: Alexander, Early Rivers, Hale's Early, Triumph, Russell, Champion, Hill's Chili, and Wright.

PEARS: For trial only, Seckel, Sheldon, and Flemish Beauty.

PLUMS: American—Forest Garden, Hawkeye, and Minor. Japanese—Burbank.

STRAWBERRIES: Bederwood, Warfield, Crescent, and Senator Dunlap.

For District No. 14, comprising Dawson, Lincoln, and Keith counties we recommend the following for general planting.

APPLES: Summer—Duchess, Early Harvest, and Yellow Transparent. Autumn—Wealthy and Utter's Red. Winter—Ben Davis, Winesap, Janet, Missouri Pippin, and Jonathan.

BLACKBERRIES: Snyder.

CHERRIES: Early Richmond, English Morello, and Montmorency.

CRAB-APPLES: Whitney No. 20, Hyslop, Florence, and Martha.

CURRANTS: Red Dutch, Victoria, and White Grape.

GOOSEBERRIES: Downing and Houghton.

GRAPES: Moore's Early, Worden, Elvira and Concord.

PEACHES: Alexander, Early Rivers, Champion, Crosby, and Wright.

PLUMS: American—Wyant, DeSoto, Forest Garden, and Hawkeye. European—Lombard.

RASPBERRIES: Cumberland and Kansas.

STRAWBERRIES: Senator Dunlap, August Luther, Splendid, Bederwood, and Crescent.

For District No. 15, comprising Hitchcock, Hayes, Perkins, Chase and Dundy counties, we recommend the following:

APPLES: Summer—Duchess and Yellow Transparent. Autumn—Wealthy, Utter's Red, and Fameuse. Winter—N. W. Greening, Ben Davis, Gano, Janet, and Winesap.

ASPARAGUS: Conover's Colossal.

CHERRIES: Early Richmond, Montmorency, English Morello, and Dyehouse.

CRAB-APPLES: Whitney, Hyslop, Florence, and Martha.

CURRANTS: Red Dutch, Victoria, Cherry, and White Grape.

GOOSEBERRIES: Downing and Houghton.

GRAPES: Moore's Early, Worden, Elvira, and Concord.

PEACHES: Alexander, Early Rivers, Russell, Hill's Chili, and Wright.

PLUMS: American—Forest Garden, Hawkeye, Wolfe, and DeSoto. RHUBARB—Linnaeus.

STRAWBERRIES: Bederwood, Warfield, Crescent, and Senator Dunlap.

For District No. 16, comprising Logan, Thomas, Hooker, McPherson, and Grant counties, we recommend the following for general planting:

APPLES: Summer—Duchess. Autumn—Wealthy. Winter—Walbridge, Iowa Blush, and N. W. Greening.

CHERRIES: Early Richmond and Montmorency.

CRAB-APPLES: Whitney, Hyslop, Florence, and Martha.

CURRANTS: White Grape, Victoria, and Cherry.

GOOSEBERRIES: Houghton.

GRAPES: Concord.

PLUMS: American—Stoddard, Cheney, DeSoto, Forest Garden, Wolf, and Wyant.

For District No. 17, Cherry county, we recommend the following for general planting on dry land with good care:

APPLES: Summer—Duchess. Autumn—Wealthy. Any varieties recommended for Districts 3, 8, or 9, will do well in most places in District 17.

CHERRIES: Early Richmond, Montmorency, English Morello, and Dyehouse. For trial, Early Morello and Terry.

CRAB-APPLES: Whitney No. 20, General Grant, and Virginia.

CURRANTS: White Grape, Victoria, and London Market.

GOOSEBERRIES: Houghton.

PEACHES: Alexander and Wright.

PLUMS: American—Wyant, Stoddard, Cheney, and Hamer.

STRAWBERRIES: Crescent, Bederwood, and Warfield.

For District No. 18, comprising Box Butte, Dawes, Sioux, and Sheridan counties, we recommend the following:

APPLES: Summer—Duchess and Wealthy, with good care. Any varieties recommended for Districts 3, 8, and 9, will do well in most places for District 18, under irrigation.

CHERRIES: Early Richmond, English Morello, Montmorency, Dyehouse, and Terry.

CRAB-APPLES: Whitney No. 20, Hyslop, Florence, Martha, and Transcendent.

CURRANTS: Victoria, White, Grape, White Dutch, and Red Dutch.

GOOSEBERRIES: Houghton.

PEACHES: Alexander and Wright.

PLUMS: American—Wyant, Stoddard, Cheney, and Hamer. European—Lombard and Shipper's Pride.

RASPBERRIES: Cumberland and Kansas.

STRAWBERRIES: Senator Dunlap, Sample, Warfield, Bederwood, Splendid, and Crescent.

For District No. 19, comprising Deuel, Cheyenne, Scott's Bluff, Banner, and Kimball counties, we recommend the following for general planting:

APPLES: Summer—Duchess, Yellow Transparent, and Cooper's Early White. Autumn—Wealthy. Winter—Ben Davis, Gano, Janet, Grimes' Golden, Iowa Blush, and N. W. Greening.

CHERRIES: Early Richmond, Montmorency, and English Morello.

CRAB-APPLES: Whitney No. 20, Hyslop, Florence and Martha.

CURRANTS: Red Dutch, Victoria, and White Grape.

GOOSEBERRIES: Downing, Houghton, and Smith's Improved.

GRAPES: Concord and Moore's Early.

PEARS: Flemish Beauty, Bartlett, and Kieffer.

PLUMS: American—Forest Garden, Wolf, Pottawattamie, DeSoto, Cheney and Stoddard.

RASPBERRIES: Cumberland and Kansas.

STRAWBERRIES: Warteld, Senator Dunlap, Brandywine, Gandy and Crescent.

LIST OF ORNAMENTALS.

INCLUDING TREES, SHRUBS, ROSES, VINES, BULBS, ETC., WHICH
APPLIES TO THE ENTIRE STATE EXCEPT WHERE
OTHERWISE SPECIFIED.

Hardy Shrubs.

Snowball.	Golden Leaf (Aurea).
Hydrangea Paniculata Grandiflora.	High Bush Cranberry.
Syringa, all kinds.	Altheas.
Weigelia, Variegated and Rosea.	Caragana.
Flowering Almond.	Moss Acacia.
Lilac, all kinds.	Yucca Filamentosa.
Spireas as follows:	Forsythia.
Van Houtii.	Purple Berberry.
Arguta.	Golden Leaf Alder.
Thunbergii.	Tamarix Amaurensis.
Collosa Alba and Ruberea.	Dogwood.
Anthony Waterer.	Wahoo.
Bumalda.	Rosa Rugosa.
Billardii.	Bechtol Flowering Crab.
Prunifolia.	

Bulbs and Tubers.

Peonies.	Dahlias.
Tulips.	Gladioli.
Lilies	Tuberoses.

Perennials.

Phlox.	Iris.
Oriental Poppy.	Larkspur.
Columbine.	Foxglove.
Gaillardia.	Cannas.
Bleeding Heart.	Caladium.
Golden Glow.	

Climbers.

American Ivy (Ampelopsis Quinquifolia).	Trumpet Vine.
Honeysuckles.	Clematis.
Wistaria.	Bitter Sweet.

Climbing Roses.

Crimson Rambler.
 White Rambler.
 Wichuriana Creeper.

Prairie Queen
 Baltimore Belle.

June Roses.

Harrison's Yellow.
 Persian Yellow.

Madam Plantier.

Moss Roses.

Luxembourg.
 Crested Moss.

Glory of Mosses.
 White Moss.

Hybrid Perpetual Roses.

Alfred Colomb.
 Anne De Diesbach.
 Margaret Dickson.
 Baron De Bonstetten.
 Mabel Morrison.
 Prince Camille de Rohu.
 Tom Wood.
 Marshall P. Wilder.
 Coquette Des Alps.

General Jacqueminot.
 John Hopper.
 Ulrich Bruner.
 Paul Neyron.
 Magna Charta.
 Madame Chas. Wood.
 Fisher Holmes.
 Jules Margotten.
 Mrs. John Lang.

Weeping Trees.

Thurlow Weeping Willow.
 Teas Weeping Mulberry.

Camperdown Weeping Elm.
 Cut Leaf Weeping Birch.

Ornamental Shade Trees.

Hackberry.
 Sycamore (S. E. part).
 Carolina Poplar.
 European Mt. Ash.
 Black Walnut.
 Butternut.
 Ash.
 Soft Maple.
 Elm.

Russian Mulberry.
 Catalpa Speciosa (S. E. part).
 American Linden.
 White Birch.
 Horse Chestnut (S. E. part).
 Sweet Chestnut (S. E. part).
 Russian Olive
 Oaks.
 Hard Maple (extreme east)

Ornamental Hedge.

Berberry.
 Japan Quince.
 Spirea.

California Privet.
 Tamarix.

Common Hedge.

Osage Orange.
 Honey Locust.

Russian Mulberry.

Forest Trees.

Elm.
 Ash.
 Soft Maple.
 Catalpa Speciosa.
 Walnut.

Honey Locust.
 Russian Mulberry.
 Osage Orange.
 Box Elder.

Evergreens.

Black Hills Spruce.
 Pungens.
 Englemon Spruce.
 Douglas Spruce.
 Concolor.

Ponderosa Pine.
 Austrian Pine.
 Scotch Pine
 White Pine (extreme east).
 Balsam Fir.

Respectfully submitted,

G. A. MARSHALL, Chairman,
 G. A. STRAND,
 A. J. BROWN,
 C. H. BARNARD,
 W. G. SWAN,
 G. N. TITUS,
 E. F. STEPHENS,
 H. S. HARRISON,
 W. F. JENKINS,

Committee.

PROCEEDINGS

Proceedings of the Forty-fourth Annual Meeting of the Nebraska State Horticultural Society, held at the Lindell Hotel, January 21, 22, 23, 1913.

ANNUAL MEETING

Lincoln, Nebr., Jan. 21st, 2 o'clock p.m.

The forty-fourth annual meeting of the Nebraska State Horticultural Society commenced in the banquet room of the Lindell Hotel, and the following proceedings were had and done.

PRESIDENT'S ADDRESS.

A. J. Brown, Geneva.

Our secretary, in preparing the program for this meeting, without regard for my wishes or your feelings, arranged for a president's address, and I told him that if the society would bear it, I thought I could, so I will give you what little I have to say.

It is with great pleasure that I greet you at this, the opening session of the forty-fourth annual meeting of the Nebraska State Horticultural Society, and I wish you all happiness and prosperity in this year of grace, 1913.

It is a good thing to pause at times in our activities and look back over the way which we have traveled and note the progress we have made and see if we cannot make the past shed light over our way in the future.

The work of this society has been along two principal lines. First, determining the hardiness and value of all fruit, forest and ornamental trees; also all shrubs, vines and plants, by thorough tests in all parts of the state, and furnishing information to planters as to the sorts best adapted to their locality.

And second, advertising the state by exhibiting its horticultural products at the various fairs and expositions and distributing the publications of the society, such as the annual report published by the state and the bulletins and paper published by the society.

We today are most interested in the first line of work, and it is to this that I wish to call your attention.

As this meeting is devoted principally to the apple, my reference to the recommended lists of the society will apply to the apple lists only, unless otherwise stated. The first recommended list of the society was published in 1877, and consisted of twelve varieties, eight of which are still retained in the list. These eight varieties are Red June, Cooper's Early White, Red Astrachan, Maiden's Blush, Fameuse, Genet, Ben

Davis and Winesap. In 1879 six more varieties were added, only one of which (Duchess) is still retained.

In 1886, recognizing that hardiness and fruitfulness is very largely a question of location, the society divided the state into three districts, Northern, Middle and Southern, and recommended a separate list for each district, in all forty-three varieties were recommended, nearly one-half of which have since been discarded as not worth planting in Nebraska.

Later the state was divided into nine districts, and in 1905 into nineteen, with a list of forty-eight varieties, thus furnishing a list that has been tested in every part of the state, and a list of varieties that are best adapted to each locality.

Thus was built up our recommended list, which I think needs some revision; a few should be dropped, and a few others added. This list, however, is the latest knowledge of the adaptability of the different varieties of apples to the several fruit districts of the state and it is intended as a guide to planters, particularly those starting in Nebraska. It is an epitome of the experiences of the fruit growers of all parts of the state, covering a period of nearly one-half a century. I refer back to this work to show you that this kind of work, in order to be reliable, must of necessity require years of patient painstaking labor and investigation, and therefore, we must not be discouraged if we do not at first meet with the measure of success we hoped for in the line of work we are now entering upon.

The society has also a general list of all other kinds of fruits; also of forest and ornamental trees, shrubs and plants, which rests on the same basis of experience as the apple list, and serves the same purpose as a guide to planters.

Not only has this society collected information about the varieties, but it has secured a vast fund of information about cultural methods on the different soils of the state, methods of planting, of cultivation, of fertilizing, of pruning, or cross pollination and spraying; in fact, in everything pertaining to orchard management, which information, like varieties, is based on actual experiences and is always available to the orchardist. It is hardly worth while for me to go into detail in these matters, as they will be fully brought out in the papers and discussions later on.

This has been the principal work of the society in the past and has resulted in good to the planters of the state which is hard to estimate.

The first planters made very many mistakes from lack of proper knowledge of adaptability of varieties and many worthless sorts were planted, but most of these earlier planted trees are gone. The present day planter has all of this information at his command, and can avoid these earlier mistakes. The secretary will send this information to any one applying. While we have been learning what varieties to plant in the several parts of the state we have discovered some other important

facts. The principal one, the one that concerns us most, is that the best apples of the country are grown in the Missouri River Valley. That there is a country lying on both sides of the Missouri river about 290 miles in width that, given proper care, the orchards produce as many and as good apples as are grown anywhere on earth. These apples are just as large, equally as good in quality (flavor), better colored, and keep longer than the famous eastern grown New York apples; and while they are not quite as large, they have as good color, a better quality (flavor) and keep longer than the apples grown in the inter-mountain states. And this brings us to another line of the work this society has planned for the next decade; namely to demonstrate to the fruit growers of the state that they do not have to leave Nebraska to get into the best apple growing section of the country and to the fruit consuming public that Nebraska apples are among the best, if not the best grown.

In pursuance of this plan, the apple show was held at the state farm last winter in connection with our annual meeting and was a surprise to all interested in it. During the following two months we held five horticultural institutes, one at each of the following places: Blair, Peru, Plattsmouth, and Beatrice. These institutes were very largely attended and a lively interest maintained throughout. We are endeavoring to make arrangements for another series this winter.

Following this same plan of work, the desirability of a larger and better show, a better demonstration, this winter of what can be done in apple culture, was discussed at length at the state fair meeting and at the state board meeting following the fair. After a full discussion of the subject by the board, and with as many members as possible, it was decided to hold another demonstration this winter. It seemed to your board that the time was ripe to show to the people of Nebraska, if we were ever going to, what can be done by intelligent, progressive orchard management. The exhibit at the auditorium is the result and speaks for itself.

I trust what we have done will meet your approval and this line of work continue until we have convinced every orchard owner in Nebraska that nothing but thoroughly progressive management in the orchard pays. Keep up with the procession.

The year just closed has been one of average prosperity to the good people of our great state and the horticulturist in a general way has had his share of this prosperity. The state, as a whole, had a fair crop of all kinds of fruit, except peaches and in a few sections apples, while the southeast quarter of the state had in many places a record crop. This crop was marketed at prices hardly satisfactory to the producers. The marketing of this crop has taught us several lessons, among which the most important to my mind is the need of closer cooperation on the part of growers in handling and marketing their fruit. As proof of this note the prices that you sold for and the price the same apples are sold for on the market today. An apple growers' associa-

tion ought to give the growers better prices without increasing the cost to the consumer.

There seems to be an increasing demand for apples packed in bushel boxes, and in order that the fruit growers may be prepared to meet this demand, we secured an expert packer to demonstrate during the state fair, the different methods of packing used by the western growers with whom we have to compete. We have also at the auditorium this winter a packer who will be glad to give any one all needed information.

One has only to look over the fruit on the markets to see that we need to establish a better system of grading and to maintain that grade when once established. Make your marketing mean just what they say. Our experience last winter proves that there is a demand as well as a need for horticultural institute work. To secure results these institutes must be held separate from Farmers' institutes, and only speakers of practical experience along the lines they talk on be sent. I believe this society should make an effort to continue this work started a year ago.

In my judgment the time has come when our recommended list should be **revised**. **Some varieties** are worthy of a more extended planting than is indicated in the present list; a few should be added, and some cut out entirely.

I recommend that a committee be appointed for this work, this committee to report at the next annual meeting, January, 1914.

FORESTRY.

A few years ago there was organized in this state a park and forestry association which took over the forestry work of this society. This forestry association has been allowed to die and its membership roll and records are reported lost by our committee on forestry.

This is a matter in which we are all deeply interested, and I believe concerns the state more vitally than any other line of horticultural work, and I recommend that our committee on forestry be instructed to confer with the forester of the State University in an effort to revive the old, or to organize another, State Forestry Association.

Nebraska is the only state in the union that has not horticultural inspection law and consequently has no legally authorized horticultural inspector. The Department of Entomology of the University has voluntarily acted in that capacity when necessary.

Last summer Congress passed a Federal horticultural inspection and quarantine law, making necessary a certificate of inspection on all shipments of horticultural goods entering into interstate commerce, naming the legally authorized state inspector as the officer to issue such certificate. This inspector is also charged with a large part of the detail work of enforcing the law. This law creates a Federal Horticultural board, and gives them power to quarantine any state, or section

of country, that refuses or neglects to comply with the requirements of the law relative to the destructive insects and diseases regarded as injurious to the horticultural interests of the nation. Also to prevent shipment of any sort of horticultural products from the state or district so quarantined. As before stated this state has no horticultural inspection law and consequently does not have the power to enforce a compliance with the requirements of the federal law. I believe the time has come when the interest of horticulture demands that Nebraska shall have a sane and practical horticultural inspection law, and to this end a committee from this society has prepared a bill which has been introduced into the legislature. A copy of this bill will be held here for your inspection and you will be asked to approve or disapprove of the measure.

The work of this society has been well done in the past and I have faith to believe it will be as well or better done in the future. We must not be discouraged if we do not progress as rapidly as we think we ought. Remember that it has required forty years to learn the best varieties to plant.

Our membership is changing constantly, the young grow old and the old pass to their rest, but the same spirit of good fellowship, sacrifice and service continues as the years come and go.

The Chairman: The next thing appearing on our program is the paper on the growing of the Apple Tree, by George A. Marshall, of Arlington.

GROWING THE APPLE TREE.

George A. Marshall, Arlington.

The tree, when received from the nursery, should be of fair size, and in a healthy, vigorous condition, not over three years old, not forked, but with a **central body**, and side branches of not over one year's growth. It is well to grout the roots in a thin mud mortar, as soon as received. Then after the orchard ground has been well prepared the trees should be planted three or four inches deeper than they stood in the nursery, leaning them very slightly to the 1 o'clock sun, placing the largest and lowest limbs on that side. They should not be allowed to suffer by any means, but urged and coaxed on to start growing just as quickly as possible. If the soil and weather are dry at time of planting, they should be mulched and then watered. It must be remembered that a tree well started is half grown.

Cultivation should be begun in the orchard immediately after the trees are planted. Cultivated crops can be profitably grown in the orchard the first few years. When the trees have grown too large for this crop to be profitable, the cultivation should still be kept up with more or less vigor, according to location, and to the annual rainfall, etc.; in other words, the trees should have sufficient moisture and care

to allow them to make a healthy, ripe growth. They should not be trimmed at all the first year further than to shorten in the side limbs about one-half of the past season's growth, the leader or center being left a little longer, so it can continue to retain its leadership. The second year, the real pruning can begin by removing the superfluous limbs, leaving only those which are to remain during the life of the tree. In doing this, it should be remembered that three or four side limbs and the leader are sufficient and that these side limbs should be well distributed on all sides of the body and not closer than five or six inches to each other. Unless one has in mind the size these limbs will attain when fully grown, they are apt to make the dangerous mistake of leaving them too close together, and in this case, they will become crowded when four or five or six inches in diameter and the result will likely be disastrous.

Now this seems like a simple thing, but it is one of the greatest things in training an apple tree. I know we made a mistake and I see it all over the country, in leaving two to three times too many limbs. They look nice, that is true, when the tree is little, but when the tree gets grown, you will see they are actually pushing each other. Most of the trees are ruined by crowding down, and the limbs being out of proportion, they finally break down, and rot in the center of the tree.

It is very important that each limb shall have sufficient room at the base to develop naturally, that it may unite firmly to the body with as much shoulder as possible, and as it is natural for the given variety to develop. This will largely eliminate the splitting down later. This well done, the balance is easier. Simply run through the trees about once a year, cutting out forks and limbs that cross and rub and thinning out the thick places by removing the most undesirable limbs. It must be remembered that wounds on young trees heal much more rapidly than on old ones.

Never try to train a tree in a way that is unnatural to the variety. You will find that a life-long fight, somewhat discouraging and very hard on the tree. Simply help nature by trimming the tree in accordance with the way it desires to grow.

While there are several minor things that have to be looked after from time to time such as preventing injury from rabbits, mice, gophers, etc., etc., yet the planting, cultivating and pruning are the three main things to be well carried out, and if this is done success is almost certain.

A tree can be grown into bearing as cheaply and with as much certainty here in Nebraska as any place I know of.

DISCUSSION.

The Chairman: These papers are intended for discussion after they are read, and if there is any one here who would like to ask Mr.

Marshall any questions, or has any ideas they would like to advance along this line, there is an opportunity given now for you to question Mr. Marshall, or say what you wish to say.

Mr. Dickinson: I would like to ask Mr. Marshall what year of the trees' growth he would cut back that center head, if at all?

A. What year of the growth?

Q. Yes, sir?

A. Well, if the tree has been allowed to limb out in the nursery, I would trim it back when the tree is planted, and of course that would be the previous year's growth. If you do not do that the head will not be symmetrical. Now if the growth is all through, you might not have to trim that tree at all. But if you had quite a vigorous growth in the nursery, the previous year, you would be compelled to cut those side branches back, and get them started, and in that case you will have to cut the leader back a little bit to keep it along with the rest of the tree.

Q. I notice in your paper that you let the leader grow the second year?

A. No, sir, you misunderstood that. I leave it a little longer so as to maintain its leadership.

The Chairman: Is there any one else that has any questions they would like to ask?

A Member: I would like to ask the gentleman, how it would do to cut this leader off entirely?

A. Why, the tree would be without a leader, that is all.

Mr. C. G. Marshall: Wouldn't that make a tree that would be apt to split down a great deal worse than one that has a leader?

A. Yes, sir. I think that is the idea in having a leader. One that the limb would branch off from, and you will not have a tree from which the limbs are so apt to split off.

Mr. Yeager: I think Mr. Marshall stated that he recommended the three year old tree. Now we know that trees of the various varieties are not the same size at the same age. My observation is that we are coming more and more to planting younger trees. That, of course, is where the large orchardists are planting, and it seems they are planting younger trees, and some are even planting yearlings. But in the average home, or farm orchard, it seems they are planting two or three year old trees. But still I think that the day is coming when they will plant younger trees; perhaps not yearlings, because of commercial reasons, but the two and three year old tree. Don't you think, Mr. Marshall, that the young tree is more certain to grow than the older one?

A. Up to three years, any age under that. I believe that a tree up to three years old can be planted with perfect safety, but if you want the tree limbed out, you must have it three years old, or a two limb top at least with a vigorous growth, at least the second year. And then letting it grow two years after that. But the idea in that is that when you limb that tree you must have enough of length to the body so that you can

spread those limbs out. If when you come to limb it, it is short, and down to the ground, you can not have space enough to distribute the limbs on. They will go on and get established, and the third year you will have a result of what they call a whorl of limbs, all coming out at one place, and that is what you must avoid. You want them spread up and down the body. They want to be scattered. You must have 18 inches, at least, to grow these limbs on. You must know how to limb a tree in the orchard. Of course the young tree will grow easily, and if you are planting a large plantation it is a cheaper tree to buy, and it is an easier tree to plant.

Mr. Benz: I would like to ask the speaker if he has any experience in regard to fertilizer, for the tree at the time of planting. I notice a large nursery firm advocates a solution of nitrate of soda as an inducement to growth. I would like to ask if it has been tried?

A. I never had any experience in that line. An old gentleman made a remark that answers that question in Nebraska. He said that a fifteen-cent boy with a twenty-cent machine, could manufacture more fertilizer in twenty minutes than has ever been used in the state of Nebraska. We tried it once however in a nursery, and I guess Mr. Brown had some of the same experience. We tried four tons of it at our place, and we got four or five different mixtures and took the advice of the expert Swift's man. We took his advice as far as his knowledge went with our experiment, and we used the bone meal, and blood mixture, and we could tell where we were as long as the stakes lasted, but afterwards they broke down, and we did not know where they were. Of course it might have helped some, but we gave it up as a bad job. I have found, however, in sprouting a tree, that if you have land that would be good corn land, all you must have for trees is moisture.

The Chairman: About the last thing before we close this session, there will be a question box opened. The question box is open now for questions, and any person who has a question that he would like to have discussed at this meeting, will please hand it to the secretary, and it will be put in the box and answered, or discussed before the meeting is over. This paper has been quite amply discussed and we will listen to one by Roy E. Marshall, on the "Influence of Cultural Methods on the Growth of Apple Trees."

INFLUENCE OF CULTURAL METHODS ON THE GROWTH OF
APPLE TREES.

Roy E. Marshall, Lincoln.

I realize that a paper is very monotonous, when you have to sit for quite a while and listen to it, but since we have been requested to cut these talks down as much as possible, it is about the only way we can treat them so if you will bear with me a few minutes we will get at it right away. (Reads paper as follows):

The influence of different cultural methods upon the growth of apple trees is a subject which would require data for several consecutive years before any definite conclusions could be drawn, so what little I have to present in this paper must be considered as merely suggestive, as it represents the results of only the past season.

During the past few years a great deal of interest has been shown in the different methods of orchard culture. Experiment stations working along this line almost unanimously recommend clean cultivation during the fore part of the season followed by a cover crop sown sometime during the latter part of July or first part of August.

A number of different cultural plats were started at the Nebraska station in the spring of 1901, when the present orchard was set. Comparisons of the trees in the different plats have been in favor of the cultivated and straw mulched plats. These plats have not only seemed to make the best growth from year to year, but they have retained the soil and fertility better than some of the other plats.

In the plat in which clean cultivation has been practised during the entire season, the trees have made a good growth but the soil has eroded badly. It was necessary to place dikes made by placing foot boards on edge, at right angles to the gentle slope, and now we find the surface roots, of the trees are exposed. At the lower end of this plat, tons of soil have accumulated during the past few years, showing the immense amount of soil that may be carried away under this system of culture in a few years. Another bad feature of this plat is that the late cultivations have kept the trees in a thrifty growing condition rather late and early freezes have killed them back in a few cases.

Where the cover crop is sown sometime during the latter part of July, both of these difficulties are overcome. The cover crop takes up the moisture at this time and the wood is hardened before freezing weather is apt to appear.

This cover crop growth standing on the ground over winter holds the leaves and snow on the land and thus alternate freezing and thawing is lessened to quite an extent. When the growth of the past season is worked into the soil, it adds some fertilizer and keeps the soil from washing so badly, if the orchard is located on a side hill or much of a slope.

The straw mulch will retain more moisture in the soil than any of the methods where cultivation is practised, and thus it tends to produce quite a vigorous growth each year, but the branches continue growth too late in the fall as under the clean cultivation and are apt to be hurt by early freezes. The trees grown under such conditions are not encouraged to root very deep as there is an abundance of moisture just underneath this mulch. Young trees grown with such a mulch are more subject to injuries from rodents, and insects and diseases are more prevalent. It is almost impossible to use orchard heaters where the straw mulch is used on account of the danger of fire.

In another plat the weeds have been allowed to grow. They are usually mowed three or four times during the season, and left lying on the ground. The trees in this plat are not as large as those in the other plats. About the only advantages of this method of orchard management are that there is less work and the fruit grown under such conditions is usually of a higher degree of color.

During the past summer the foliage of the cultivated and especially of the trees of the straw mulched plat, as it is located beside the weed plat, seemed to have a darker green color than did that of the trees of the weed plat. The season was a rather dry one and this difference of color was accounted for by the assumption that the straw mulch had plenty of moisture which had accumulated previous to the dry part of the season and was being retained by this mulch.

This difference of the appearance of the foliage led us to wondering how much difference there was in the growth made by the different plats during the season, so it was decided to take measurements of the trees from different plats for comparison. As the Ben Davis trees outnumbered the other varieties, three representative trees of this variety were selected from each plat, from which measurements were made of the past season's growth.

From each of these three trees, representative branches from the main trunk of the tree were selected. Two of these were always located on opposite sides of the tree, and one from the central portion of the tree extending upward. Thus we were able to get at the average length of branches produced by each tree.

In order to get a fair comparison between the trees of the different plats, all branches of three-tenths of an inch or more were measured to the tenth of an inch. This included everything grown during the past season except mere buds. For this reason the average length of the branches of the different plats will run very low. However the longer twigs at the outer ends of the branches varied in about the same proportions as the average length of twigs do.

From a total of 2905 measurements taken from the trees of the clean culture plat, an average length of 2.6 inches was obtained. In the plat where this cultivation was discontinued in July, and a cover crop of millet sown, 1,683 measurements were taken which gave an average of 1.9

inches. This difference of .7 of an inch is accounted for by the fact that the cover crop checked the growth of the trees when sown, and the wood was hardened up, while the clean cultivation kept the twigs from that plat growing quite late in the fall. These twigs were not injured by freezes as the cold weather held off quite late last fall, allowing the previous season's growth ample time to mature.

From 1,873 measurements taken from the trees of the weed plat, an average length of 1.7 inches was obtained. This, as expected, gave the shortest growth, which is accounted for by the fact that the weeds draw heavily upon the soil moisture during the entire season and as last season was a rather dry one, the effect was more noticeable. During seasons of plenty of rain, there might not be a very noticeable difference between this plat and the others.

One thousand, seven hundred fifty-nine measurements were made in the straw mulch plat, which gave an average of 2.2 inches. This plat would naturally be expected to show the largest growth during the past season owing to the value of a mulch of this kind in retaining soil moisture, but the average length of the branches of this plat are .4 of an inch shorter than those of the clean cultivation plat. We are at a loss as to how to account for as much difference. It is apparent that it must be due to some factors other than soil moisture. However, we must remember that there are a number of purposes served by cultivation of the soil, such as:

1. Improving the physical condition of the soil.
2. Promoting better soil drainage.
3. Helps the soil to appropriate any fertilizer which may be used.
4. Releasing new plant food in the soil.

Then it conserves the soil moisture and keeps down the weeds but these are also accomplished by the use of the straw mulch to a greater or less extent. It might be stated here that the cultivation practiced in the clean culture plat was very good. A fine soil mulch was kept on the surface throughout the whole season, which would conserve a great deal of the moisture, but from previous work in the horticultural as well as the soils departments at the experiment station, we are convinced that the straw mulch was more efficient in conserving this moisture.

Three sod plats consisting of alfalfa, clover and mixed grasses, respectively, have given comparatively the same results as regards the tree development since the plats were started. Last spring a division was made cutting each of these plats in halves. One-half was plowed early in the spring, and the other half was allowed to continue as before. The object of this was to see what results cultivation for two or three years would have upon orchards that have been in sod for a number of years.

Visual comparisons of these plats last summer, showed that the foliage in the cultivated plats had a richer dark green color and was larger than that in the part remaining in sod, which showed they were making a more vigorous growth. The writer had intended to make

similar measurements from the past season's growth of these plats for comparison also, but owing to the lack of time and the cold weather of late, they have not been measured, but will be very soon.

However we have compared the trees in these plats, and find there is quite a noticeable difference in the growth the trees made last year in favor of the cultivated area. This would indicate that many of our old orchards in the state, which are now growing in stiff grass sods or weeds, would be induced to throw out quite a vigorous growth and in this way help to rejuvenate them, if they were plowed up and cultivated for two or three seasons. In fact I know of several instances where such has been the case, and the results have not only been an increased vigorousness in the trees themselves, but larger yields of fruit have resulted. In talking with some of these men, who by the way are mostly those who have been leasing orchards, I find that they intend to keep their orchards under cultivation.

As was stated at the beginning of this paper, no definite conclusions are to be obtained from this work, as it should cover a period of several years. However they would indicate that in order to obtain the largest growth of new wood each year, that clean cultivation, i. e. cultivation every ten days to two weeks, throughout the entire growing season, or a straw mulch should be used. The former may be used for only a short series of years, as the erosion of the soil and the lack of organic matter added would soon be showing up very strongly against this method of culture. Then there is the danger of the wood not becoming mature by the time weather, that would injure the late growth, would set in.

The straw mulch is objectionable as it does not encourage deep rooting, is a breeding place for insects and diseases and then there is the danger of fire if orchard heaters are used.

While the clean cultivation followed by a cover crop does not seem to send out as much new wood each year, we must remember that what new wood is produced is fully matured, thus eliminating any loss due to the early freezing of the twigs. The trees in this plat seem to be as thrifty and have made as great a total growth in the series of years since the culture plats were started as any of the plats. Alternate freezing and thawing is also lessened as the cover crop holds a carpet of leaves and snow on the ground better than any of the other methods.

In conclusion, I would recommend that the clean cultivation with the cover crop sown in July be used wherever possible, and especially where the same method of culture is to be practiced year after year. Orchards in sod or weeds should receive a thorough cultivation for two or three years to put the trees in a more vigorous growing condition, but do not continue too long, as serious losses of soil by surface runoff are sure to follow as soon as the vegetation consisting of roots and growth above ground are thoroughly decayed.

DISCUSSION.

The Chairman: This paper is open for discussion the same as the other, and this applies to all papers that are read, without any further announcement. Any one who has any questions they would like to ask the reader of the paper is at liberty to do so immediately following the reading.

A Member: I would like to ask what crops seem to give the best results?

A. Millet and cane seem to be used mostly in this section. I do not know of any case outside of the state, but millet is already used and all right provided you do not sow it too early so that the frost kills it before seed matures.

Mr. Christy: Isn't it a fact that where an orchard is cultivated and kept up thoroughly, that it won't come into bearing early?

No response.

The Chairman: If there is no further discussion on this paper, we will listen to a paper by Mr. Harrison of York, on "The Mission of the Nurseryman."

THE MISSION OF THE NURSERYMAN.

By C. S. Harrison.

Ours is the most ancient and honorable of all the callings. Our first parents were put in the Garden of Eden "to dress it and keep it." All went well till they got to stealing apples, when they lost their place. The moral of this is, the nurseryman must be honest.

What wonders have been accomplished by our horticulturists! They found bleak and wind-swept prairies, and they have transformed them. Groves, orchards and windbreaks have testified to their enterprise and persistence.

There is something in the business, however, besides chasing the dollar. The nurseryman should be a teacher. Too often he lets Tom, Dick and Harry carry on his business and he does not raise what they do not call for. The average man does not know much about floriculture and horticulture. He needs information. The horticulturist should give it. He should himself be the kite and not the mere tail of the kite. New things of great merit come out, but you cannot get him to touch them. It is his business to make a call. That is what he is for. He has no right to degrade his calling by keeping everlastingly in the ruts. We have passed the pioneer stage and now comes the period of home adornment. Our slogan should be "Beauty is Wealth"; raise a lot of it and be rich.

The average farmer knows little of the beautiful things which embellish the home. He needs information, and you should give it. It is the province of the horticultural and agricultural papers to enter on a campaign of publicity and give wide information to these things. It is

easy to understand the value of beauty. You build a house like a barn and nobody wants it. Make a poem in architecture and everybody wants it. I saw a beautiful team of chestnut horses at Bennington, Vermont, which cost \$40,000. Of course \$39,000 was for beauty and style. Perhaps for \$300 you could have gotten a team of plugs which could go as far in a day as they could. Your Shorthorns, beautiful and symmetrical in form as if laid out with square and compass, are worth ten times as much as scrubs of the same weight.

A farm, beautifully adorned with an ideal front yard, is worth far more than one the yard of which is a hospital for sick pigs and disabled machinery.

Horticulture is in a transition state. Nurserymen find themselves stocked up with millions of apple trees they can not sell. The great Stark company have dissolved, and one of the members is going into ornamentals on a large scale. Sooner or later you must come to it. The country is being flooded with attractive and beautifully illustrated literature, and millions of dollars are going east that you ought to have if you would wake up to your possibilities.

You people of the northern states do not realize your condition. There are compensations for your long, cold winter. Spring comes and the whole land awakes to a beauty unknown elsewhere. California can not compare with Minnesota in the beauty and fragrance of her flowers. Peonies can not grow there, and what marvelous displays they give you at your summer meetings. We must hammer along the lines of the development of our perennials. I repeat, if there are no calls, then make them.

A few years ago we had a splendid lot of peonies. No call for them. They are the old, ill-smelling "pinys" our grandmothers raised. Your speaker was the first to publish a peony manual, the first in any language. The first edition cost \$75. A man in Minneapolis borrowed a copy and bought \$150 worth of peonies. A lady in Topeka read one and bought \$25 worth. We were just closing business in the fall when an order came for \$200 worth. The first edition went and we issued another. We raise a good many but this year we had to buy about \$1,500 worth. One year we purchased \$1,600 worth besides what we could raise. You must enter on a campaign of publicity.

Here is the coming flower, the iris. You speak of it and you are met with the objection, "Oh, it is nothing but the flag which grew in the swamp down east." People know nothing about this resplendent flower, named from the goddess Iris, the rainbow personified. She took all the prismatic tints of the rainbow and wove them in garments of splendor for her child.

I have been to California, the land of flowers, to Rochester, the garden of America. I have visited the estates of the rich in the east, and have been in the finest parks in the land, but I never saw anywhere so

much beauty, splendor and loveliness as people saw in our iris garden with its 180 varieties.

They are the finest drouth resisters we have. Last season we had but six inches of rain in five months. It was awful. Dry with hot winds blowing like the blast of death, but we did not lose an iris. Last winter will long be remembered for its terrible cold and fearful storms, yet not an iris died, though unprotected. By careful selection they will bloom nearly two months. They are ideal flowers for the town and farm. They are cheap. You can get some fine sorts for from two to five cents. They multiply about ten in two years. I get letters from nurserymen "they are fine, but there is no call for them." Then make a call; it is your business. There is more money in them than anything else you can handle.

A few years ago we stocked up on them and how they have multiplied. We tried to sell—no call. We then published the iris manual and now we sell about 25,000 a year. Yet they multiply so fast we must scramble to keep out of their way. When you see a thing of known merit then push it.

We want publicity. It is time for our editors to help along. Too often you send in an article on home adornment or give them a description of some worthy flower and the article comes back to you—"no call for it." Plenty of room for the barn-yard, but no space for the front yard.

On other things our editors are all right. Take the hen. How they have magnified and glorified her and made a queen of her. Take up any agricultural paper and column follows column. There is a line upon iteration and reiteration. Direction following direction till the wonder is the poor hen gets a chance to lay an egg. But she does and the more she lays the higher the price. And the proud rooster from early morn till dewy eve sounds the praises of his harem. And the editor turns in and crows to beat the rooster and then cackles to beat the hen. What tons upon tons of literature that hen gets! What a pity that just a little of the attention and affection given her could not be transferred to these queens of loveliness, the peony, the iris, the phlox and the columbine.

Our editors have added millions of dollars to our dairy interests by showing the difference between poor and good cows. Two farmers live side by side. One keeps twenty cows; the other has only eight but he sells more milk and butter than the other. The queens of the dairy have come to the front. They and their progeny bring fabulous prices because they are worth it.

We need the same attention the cattle receive. It will pay. Millions of dollars are held in abeyance.

Besides our ornamental shrubs and perennials there are two which are going to push their way to the front. They are the Japanese and Chinese tree lilacs. They are trees. They bloom in June. I like the Chinese the best. There is one in front of my house, sixteen years

old from seed, which is seven inches through a foot from the ground and 20 feet tall. It was flooded with a great mass of snowy white, honey scented flowers. Thousands of seedlings are now being offered at \$5 per hundred, but the reply comes "no call for them."

The nurseryman should keep along the advancing wave which is surely coming. He should help the wave along. He should buy and plant hardy things of real merit and get acquainted with them and have his agents understand them also. He should insist that papers that carry his ads should enter on a campaign of publicity and give the front yard as good a show as they give the barnyard. He should not wait for others to spend thousands, giving information and he follow and reap the harvest for which they are sowing.

The Chairman: It is all right Brother Harrison, line upon line, and precept upon precept, and we will heed it later on. The next paper is upon the subject of "Orcharding in Fillmore County," by R. A. Burns, of Geneva.

ORCHARDING IN FILLMORE COUNTY.

R. A. Burns, Geneva.

Mr. President, Members and Friends:

My experience with orcharding in Fillmore county, or anywhere else for that matter, having been quite short, I shall confine myself to an account of the orchard with which I am directly connected, and not try to describe general conditions over the county, as my subject would seem to call for.

Our soil is of a loess formation, underlaid at a depth of from two to three feet with a clay subsoil approaching hardpan in consistency. This, by many, is not considered ideal for apple growing on account of neither moisture nor roots being able to penetrate it readily, and they are doubtless right. However, we have been able to get some fairly good results, and take it as it comes, with no present intention of moving. Our own orchard was planted in the years 1886 and 1887, and covers twenty and a half acres, exclusive of the windbreak which I am glad to say is ample.

There are about 922 living trees planted 32 feet apart each way, and consist in the main of the following varieties, Ben Davis, Winesap, Gano, Genet, Missouri Pippin, Jonathan, G. G. Pippin, Wealthy and Cole's Quince. There are also two rows of experimental varieties which contain a large variety of crabs and summer apples.

Cultivation has been neglected for several years, with the result that part of it was quite heavily sodded with blue grass, but this has now been turned under with a plow and will be kept cultivated with a cutaway disc or similar machine. We anticipate that this will work an inconvenience in one way, to counter-balance the good it may do, in that it will be impossible to move the spraying machine about so soon after a

rain as it was formerly; however, we have no doubt as to the benefit of cultivation. Nor have we any doubt as to the benefits of spraying, so we employ that agency for the discomfiture of the worms. As it may be of interest to some, and as I see no regular paper on this subject, in our program, I will give an account of the methods we have used and the cost of spraying.

A power sprayer of some kind in these days' is, of course, a necessity, and we use one having a three-horse-power gasoline motor, which works very satisfactorily and will maintain a pressure of 200 to 225 pounds on three working nozzles. It is equipped with an elevated platform 10 feet from the ground, without which it would be impossible to do satisfactory work in the tops of the trees as they are on an average about twenty-five feet high and many are considerably higher.

In the course of the second and most important spraying, it seems to me that better work can be done, even in lower trees, if more of the spray is directed from above, as most of the blossoms point upward and the insecticide can be thrown more directly into the calyx from above than when working from below or on one side.

In our second spraying last season, we had two men working from the elevated platform and only one on the ground so as to throw more of the spray from above. It nearly drowned the one poor man below, but I think it was of some benefit though I have no figures for comparison.

For spraying material we used lime-sulphur (commercial) diluted at the rate of seven gallons to 250 gallons of water as a fungicide, and lead-arsenate two pounds to fifty gallons of water as the insecticide. There are, of course, several brands of each on the market, all doubtless good, but we found a brand of lead-arsenate last year costing seven cents per pound and using two pounds to fifty gallons of water to give better results than a brand used formerly, costing 22 cents per pound and using one pound to 50 gallons of water, so there is evidently some choice among brands. As complete a record as we could devise of the cost of labor and materials for each spraying was kept and figured up to give totals in each particular.

In getting at the cost of materials we merely set down at the end of each day the number of tank loads of mixture, of 250 gallons each, applied that day, and as we knew the amount of "dope," as the boys call it, placed in each tank, we could easily tell how much was used each day. I might say in passing that it is well to use up all there is in the tank before stopping at night and then rinse it out well with clean water. If this is not done, and say, half a tank is left to run out next morning, it is almost sure to form a deposit on the screen or strainer in the bottom of the tank and give trouble by not letting the liquid through fast enough. This deposit will form anyway, in spite of all you can do, and is difficult to remove. However, we accidentally discovered one day that a little sulphuric acid poured on the strainer will

eat it off almost instantly and leave everything like new. Remove the strainer to do it though, for if the acid gets on the rubber hose anywhere it will make a strainer of that too.

In making the following table of costs a man's wages were reckoned at \$2.00 per day and a team at \$1.00 per day. On account of delay in shipping, lime-sulphur was not used in the third spraying and the amount used in the second spraying was reduced to three gallons per 250 gallons of water. This, of course, reduced the total cost slightly.

Number of Spray. First, May 2d; second, May 13th; third, June 14th; fourth, July 31st. Number of 250 gallon tanks used on first spraying, 10; second spraying, 32½; third spraying, 19½; fourth spraying, 14. Number of gallons of lime-sulphur used first spraying, 70; second spraying, 97½; third and fourth sprayings, none. Pounds of lead-arsenate used first spraying, none; second spraying, 325; third spraying, 195; fourth spraying, 140. Gallons of gasoline used, first spraying, 7½; second spraying, 24½; third spraying, 14; fourth spraying, 10½. Cost of materials used: Lime-sulphate, first spraying, \$11.20; second spraying, \$15.60; none the third or fourth sprayings. Lead-arsenate, none the first spraying, and \$21.93 the second; \$13.16 the third; and \$9.45 the fourth. Cost of gasoline: First spraying, \$1.20; second spraying, \$3.92; third spraying, \$2.24; fourth spraying, \$1.68. Total for materials used:

Number of 250-gallon tanks used altogether.....	77
Amount of lime-sulphate used altogether (gallons).....	167½
Pounds of lead-arsenate used altogether.....	660
Gallons of gasoline used altogether.....	56½
Cost of lead-arsenate for 4 sprayings.....	\$44 54
Cost of lime-sulphate for 4 sprayings.....	42 80
Cost of gasoline for 4 sprayings.....	9 04
Cost of materials used in first spraying.....	12 40
Cost of materials used in second spraying.....	41 45
Cost of materials used in third spraying.....	15 40
Cost of materials used in fourth spraying.....	11 13

Total cost of four sprayings\$80 38

Time used in first spraying	2 days
Time used in second spraying	5 days
Time used in third spraying	3 days
Time used in fourth spraying	2¼ days

Total time used in spraying.....12¼ days

Labor cost first spraying.....	\$14 00
Labor cost second spraying.....	37 50
Labor cost third spraying	21 00
Labor cost fourth spraying	16 87

Total labor cost of four sprayings.....\$ 89 37

Total cost per spraying—

First spraying, total cost	\$ 26 40
Second spraying, total cost	78 95
Third spraying, total cost	36 40
Fourth spraying, total cost.....	28 00

Total\$169 75

Labor cost per tree, .096 cents.

It will be noticed that the number of gallons of mixture applied per tree in the second spraying, eight and eight-tenths, was far in excess of that in either the first, third or fourth spraying, in fact, it was almost half of the entire amount used. This is, of course, in accordance with the generally accepted rule, that the second spraying is the time to do your work, but we believe that it can not be impressed too strongly that skimp the others if you must, or leave them out altogether, but spare no pains to thoroughly cover the trees in the second spraying, and if you are not sure, put on a little more.

As a result of the best we could do in the spraying line, I am glad to say that we practically annihilated the worms in our crop last season.

In harvesting our crop we changed our former method in several particulars and were well pleased with the results in most cases. The most important was in changing from payment by the day for picking, to payment by the bushel. Tickets good for the required number of bushels were given to each man when the wagon came for his apples and these could be cashed in at any time. For use in case a man had finished a tree and moved on before the wagon came, each man was assigned a number and given cards bearing this number, and when he left his apples he placed one of these cards in a conspicuous place among his filled boxes and we were able to credit him with the correct number of bushels and give him the tickets when we came to him.

Of course, this "by the bushel" system required a good man to be on the watch all the time to see that the fruit was not handled too roughly or shaken off the trees, and it was possibly handled with less care than a good man would have used working by the day; however, when we considered the fact that the best a \$2 per day man seemed to be able to do was about 25 bushels per day, costing us 8 cents per bushel, you see, and at four cents per bushel he could get from 60 to 110 bushels per day, we felt able to struggle along with this small disadvantage.

We paid 4 cents per bushel for all varieties practically all the way through, but towards the last the Winesaps being rather small and naturally hard to pick, owing to the shape the trees grow, we began paying five cents per bushel for this variety. Our trees being unusually heavily loaded last year,—the best tree noted having slightly over 40 bushels, and practically every tree of winter varieties, except Winesap, running 15 bushels or better, the men were enabled to make very good wages.

Sacks emptying at the bottom were used to pick in, and though there are objections to them, we believe they are more satisfactory in the long run. Boxes to transport the apples to the grader and then to the cars were used and the low truck solid bottom racks would hold 69 boxes, without piling up. Ladders running to a point at the top and 18 to 20 feet high, seemed to be the popular thing, and though they must be light, with reasonable care they seemed to answer every purpose.

Our summer apples, as well as the Jonathan and Grimes Golden, were sorted by hand to remove those under two inches, for as I mentioned before, we had practically no worms to look after, and very little or no blight of any kind.

The winter varieties, after being loaded in the orchard, were hauled to our home-made non-patented grading machine, for which we at least claim originality, as we never saw or heard of one like it. To construct it, we merely took nine iron rods one-half inch in diameter and six feet long, and slipped over each one a piece of half-inch rubber water hose. This was to lessen the danger of bruising. These were set in an inclined frame the proper angle of which was discovered by experiment, and at a distance of two inches apart, with the idea of letting the apples under two inches fall through, while the larger ones rolled on and into a canvass shoot leading to the boxes again. We found, however, that as most all apples are larger one way than the other, they all seem to roll the narrow side down, it was necessary to reduce the distance between the rods to about one and three-quarter inches, this contingency having been provided for by making the space quite easily adjustable. The upper end of the rods being about five feet from the ground, the man on the load could easily empty the boxes one by one, and as the pile of small ones which dropped through became too large the machine was moved or the apples shoveled away. It was found necessary to have one man stand at the side of the machine to keep the apples down as some would stick, one man to tend the canvas shoot or dump, and one to carry away the full boxes and place them on another wagon. These, with one man to empty the boxes, made four men necessary to keep the machine going, but a load of 69 bushels could be run over in about twenty minutes, so it was quite a saving over hand work and did not seem to bruise the fruit much. Indeed, we hardly see how we could have managed without something of the kind as, owing to an unusually dry season and heavy load on the trees, there was quite a percentage of small apples in our crop.

From the machine the apples were hauled directly to the cars and loaded in loose at so much per hundred weight, which was the method used in disposing of the bulk of our crop. The summer apples, and of course a few of the Jonathan, Grimes Golden, and winter varieties were sold in boxes to fruit dealers and grocerymen over the state, shipments of from five to ten bushels being about the usual order.

Owing to the absence of many other commercial orchards near, we have quite a local demand,—farmers coming from a distance of 20 to 25 miles, saying “my orchard had lots of apples, but they all fell off and what are left are so wormy they are no good.” To these customers we sold almost all of our Jonathan and Grimes Golden, as well as a large number of winter apples, and many bushels of the smaller apples taken out by the grading machine.

When we were finally through, or about through, the receipts, expense and net profits figured up as follows:

RECEIPTS.

From crabs and summer apples.....	\$ 393 80
Fall and winter apples sold locally.....	849 60
Winter apples sold in car lots.....	2,937 29
Culls sold locally	50 00
Miscellaneous sales, cider, etc.....	25 00
Apples on hand and in storage.....	200 00
	<hr/>
Total	\$4,455 69

EXPENSE.

Picking at 4 cents per bushel.....	\$ 416 75
Graders and help	208 30
Spraying	169 75
Boxes	75 00
Incidentals	20 50
	<hr/>
Total	\$ 890 30
Net profit	\$3,565 39
Profit per acre	\$ 173 92

The Chairman: If there is no one wishes to discuss this paper we will listen to one by Prof. J. R. Cooper, of the University of Nebraska, on the subject of “What is being done to control canker.”

WHAT IS BEING DONE TO CONTROL CANKER.

Prof. J. R. Cooper, Department of Horticulture, University of Nebraska.

As it is commonly used, the term “canker” is applied to any diseased condition of the bark or wood of a tree. In order to control any abnormal growth or condition, it is first necessary to find the cause, the manner in which the infection—if such is the case—takes place, and the manner of dissemination. In the present case it is necessary to make a slight distinction between different apple tree cankers.

Named in the order of importance the most destructive cankers in Nebraska are, Illinois or blister canker; bitter rot canker, and black rot canker. In appearance and effect on the trees they are somewhat similar, to the casual observer. Bitter rot and black rot canker, however, seldom ex-

tend deeper than the bark, while the blister canker attacks both bark and heart wood and is the most difficult to control. Because of the fact that the last named disease is much more prevalent than the others, is much more destructive, and that the remedies recommended for it apply equally well to either of the others, only Illinois or blister canker will be discussed.

This canker is easily recognized, even by a casual observer. It does not require close observation to distinguish dead branches of trees that are killed by this fungus. The flow of sap is cut off and the bark dies. Often a branch is killed in a single season and the leaves and apples cling to the twigs for some time. Often the apples hang on all winter. At the base of the limb and often over its entire length may be seen at first blister-like protrusions. As the disease progresses, the tops of these protrusions become more flattened and more nearly resemble nail heads. If a thin layer is cut away with a knife, irregular circular spots of tan surrounded by a dark brown or black ring may be seen. These spots vary in size from 1-16 to 1-4 inch and are scattered all over the diseased surface in most cases, though sometimes few if any are present. Two kinds of spores are produced from these spots which spread the disease. The first set of spores (conidia) are produced in the months of July, August and September. Masses of mycelium form in more or less compact bunches called stroma; from these masses slender stalks arise, sometimes singly and simple, sometimes branched, on the ends of which the spores are formed. This is what causes the blister-like appearance on infected bark. The spores are set free by the cracking of the epidermis covering these masses and are carried by the wind from tree to tree, producing canker wherever the spores lodge in wounds, if conditions are favorable. The following season during the months of April, May, and June another kind of spores are produced from these same stromatic masses. Unlike those of the first season they are formed in sacks (asci), each sack containing eight spores. The sacks are also enclosed, several together in cases (perithecia) which are arranged in a layer throughout the irregular masses. Closing the opening of each perithecium is a plug which prevents the escape of the spores, until it has been sloughed off or disintegrated by the action of the weather or removed by some mechanical means, such as being cut off by pruning tools, the rubbing of limbs together, etc. When freed, the spores cause infection in the same way as the condition of the season before.

Infection may arise through spores lodging either in wounds in the bark, or where branches have been removed by pruning. The cankered trees at the Nebraska station and many orchards over the state were examined, and 80 per cent of the cankers were found surrounding wounds caused by pruning and broken limbs. The remaining 20 per cent were caused by wounds of various kinds. Pickers, in climbing trees for fruit, bruise the bark with their shoes. In cultivating, the trees are often injured by singletrees and machinery striking the limbs. The injury known as "sun scald" often is an open door for infection.

It might be inferred from this that it is a bad practice to prune. It is, where it is done in the careless "slipshod" method I have often observed, of chopping the branches off with an ax, sawing from the top and allowing the bark to peel down, leaving stubs all the way from one-half inch to six inches long, cutting into a cankered tree, then going right ahead to a new tree with the tools all covered with spores and never covering the wounds. If the work is done this way, the trees would be much better off if left unpruned. Careful, judicious pruning must be done and does not injure any tree, but is a means of producing more and better fruit.

It sometimes requires several seasons for the disease to destroy a limb, especially if it is a large one. At first, the diseased area may be comparatively small, but it gradually extends farther and farther up and down the branch, as well as around it. I have observed these cankers extending down one side of a large limb and the trunk to the ground and affecting the roots. A peculiarity of this disease is that only a small area of the bark at the point of infection may be affected but the mycelium goes deep into the heartwood and travels both up and down the limb, coming to the surface again some distance away, especially if the limb is injured at some other point. The progress of the disease is marked by a dark brown discoloration of the fibers. It is this rapid growth in the heartwood which makes it so difficult to control.

The increased loss each year, due to this disease, has shown the necessity of securing some means of controlling or preventing it. The stations of Ohio, Illinois, Iowa, Kansas and Nebraska have perhaps done the most work along this line. The methods used so far have proved beneficial but no specific remedy has been discovered. Professor W. O. Gloyer of Ohio station has performed some interesting experiments in which he shows that branches from which about 20 per cent of the water was driven off were most easily inoculated with the disease, and that a certain amount of oxygen was necessary for development. This was borne out by the fact that in Nebraska at least, trees which have suffered most from winter injury and drouth show the greatest amount of canker, and that infection is oftenest found where stubs have been left in pruning or where a large wound was left uncovered. In either case the amount of water is materially less and oxygen naturally present.

We must consider this depletion of water and the presence of oxygen in looking for a remedy. It is necessary first to remove the portion of bark and wood infected; second, to use some disinfectant to destroy any spores which may be present in the wound made; third, to use some sort of a dressing for the wood which will prevent the loss of sap, and consequently drying out, which will exclude air, and which is cheap enough to not be prohibitive.

All the work done up to the present time has been along this line,

and shows a fair degree of success. In many cases the disease seems to be entirely under control while in other cases it goes on developing beneath the cover. This may be due to one of three causes: First, the cut was not deep enough to remove all infected wood; second, the sterilization was not thorough; or third, the wound was reinfected through the cover not being impervious.

Corrosive sublimate, solutions of copper sulphate, and formaldehyde are perhaps the best disinfectants.

The greatest difficulty is found in securing proper material for the cover. It must be of such a nature that it can readily be applied at the season of the year when pruning is done and must form an impervious layer over the treated surface. It must adhere closely, and not crack or become soft and run off.

White lead has been extensively used, but proves unsatisfactory for large surfaces for the reason that it can not be applied in a large enough quantity to prevent checking of the wood. Of the numerous materials which have been used, perhaps coal tar, gas tar, pitch and asphaltum are most satisfactory. Coal tar contains some volatile substance, which may be absorbed by the trees and may be a possible source of danger to healthy growth. Gas tar has a tendency to be completely absorbed, and for this reason it may be necessary to renew the application in order to secure sufficient covering. Asphaltum, melted and applied hot, is perhaps the best covering for large surfaces though the disadvantage of heating before using is great. For this purpose some kind of portable stove is necessary. At the Nebraska station we use a tinner's gasoline stove. The asphaltum may be melted over a hot fire and kept warm in the orchard by using the small portable stove.

Liquid asphaltum is easily applied, but has the drawback of containing some volatile substance, used as a solvent, which may be absorbed by the wood.

In general practice it is best to remove any diseased limbs entirely unless the canker is young. Sometimes, however, the removal of the limb throws the tree greatly out of balance or, as is often the case, the cankered limb is on the south side, where its removal would expose the trunk and large limbs to direct sunlight. In such cases it is well to try to treat and save the limb unless the disease has progressed too far. In all cases enough wood must be left to support the weight of the limb and enough sound bark to conduct plant food. The canker may extend down a limb and into the trunk. Where this is the case it is best to take out the tree below the ground, unless the tree is healthy and vigorous otherwise. If the tree is strong or of a rare and valuable variety, it may be treated by removing the infected wood of both limb and trunk and treating the wound. At this station, where a large wound is made in the trunk of a tree, we fill it, after disinfecting, with cement reinforced with wire netting, and cover the whole with asphaltum or tar. All wounds should be made as smooth as possible. I find a pruning saw, a small

ax, a 2-inch gouge, and a wood mallet make a handy combination of tools for this work.

As with other diseases, an ounce of prevention is worth a pound of cure. Orchard sanitation is the most important step in preventing this disease. Many men pile the pruned brush about in ditches and leave it to decay. This is intended to prevent erosion, which it does to some extent, but also forms a hotbed for fungous diseases. All such brush should be burned. When spraying, take care to cover the trunk and limbs as well as the foliage. In pruning, make all cuts smooth and cover at once any wound larger than one inch in diameter. Disinfect pruning tools before going to another tree. We simply dip the tools in a pail containing a solution of corrosive sublimate.

Practice these measures of sanitation in your own orchard and persuade your neighbors to do likewise.

Prevention by sanitary methods and the removal and destruction of diseased parts appears to be our only method of controlling blister canker.

DISCUSSION.

Mr. Pollard: The gentleman has given us a very good discussion of this question, and I would like to ask a question or two relative to it. In the first place these orchards you have inspected, where you have found canker, are they orchards that have been sprayed right along, or neglected?

A. Both sprayed and unsprayed.

Q. Well, have you found spores in orchards that have been sprayed right along with sulphate of copper?

A. Yes, sir.

Q. Well, have you found no difference in orchards that have been sprayed with copper and lime sulphur?

A. I can not answer that question because I have made no such comparison.

Q. Well, given an orchard where the canker or spores are on the bark, will a spraying of sulphate of copper arrest that?

A. I see no reason in the world why it should not, if, as you say, the spore is on the bark. I might add, that we spray the whole tree, bark, limbs, and all, as you suggest.

Q. Then why should you find these spores in an orchard that has been sprayed regularly?

A. You will find that they got in before the spraying came. As quick as it gets below the surface, you can spray until you are gray-headed, and never touch it.

Q. Does the lime sulphur serve as a fungicide?

A. Yes, sir, I think so.

Q. The reason I am asking that is you did not mention that as an antidote for canker.

A. I do not believe you can spray a canker with anything and con-

trol it. You must go to work and cut it out. You are not going to spray that canker with anything that is going to penetrate that far and kill the canker unless you kill your tree. Whenever you strike a free spore with this, I think you will kill the spore.

Q. Another thing. This application of asphaltum for wounds caused by pruning. Now I noticed you say that the only method or the best method perhaps was to get your asphaltum in a position so that you could heat it and bring it up to a proper temperature and then you would have to have a fire along all the time?

A. Yes, sir, we carry a gasoline tinner's torch.

Q. Now this last year at home, we did a great deal of pruning, and we used a preparation of this asphaltum and father figured out a method of preparing it for application which was by first heating it and then diluting it with gasoline and next kerosene. It remained liquid-like then, and we could cover a wound with a great deal less trouble.

A. We have got back there to the objection that is made to coal tar, and that is that the kerosene which you put in there to keep that in a liquid condition will be absorbed more or less by the tree, and that is supposed to be injurious to the growing of the tree.

Q. What is the nature of the injury?

A. I cannot tell you just exactly how that is, but it acts on the bark from which the growth goes, both on the wood and on the bark and acts upon it in such a way as to prevent growth of the bark of the tree. That is the objection.

Q. You have had instances of that come under your observation. where you have seen those results?

A. Not when they were as serious as I have had reported. Now as to my own observation itself, it has not amounted to a great deal, but from reports that come in they seem to think that this may amount to a good deal.

Q. Of course this application was more in the nature of protecting the wound from a canker, rather than from the infection itself?

A. Yes, sir.

Q. So your idea would be, it would be better to use a fire of some kind, and put on the asphaltum instead of diluting it?

A. That seems to be the best way so far. If you want to use anything to dilute it, you can use linseed oil.

Q. Will that cut it?

A. Yes, sir, and that being a vegetable oil, it will not hurt the tree.

Q. What is the matter with pine tree tar?

A. That is good, but the objection is that in the summer it cracks.

Q. How is paint?

A. That does not seem to prevent cracking, and checking at all.

Q. Now you speak about using formaldehyde, do you think that will stop the spores if put on at the proper time?

A. Yes, sir.

Q. Of course if it does not get all of them it will only cure what it comes in contact with?

A. Yes, sir.

Q. If you see that the tree is diseased, would you put it on heavily, so that you could saturate it with the formaldehyde?

A. You could not do that. I would cut the fungus all off from there, and I would either bind it or cover it up with something, that would keep it all out.

Q. Do you think that using lime sulphur would disinfect the tools?

A. I do not know whether or not it would, but if it is made strong enough it would. I see no reason why it would not if you use it strong enough. But I would use corrosive sublimate.

Q. I would like to ask if wood alcohol would dilute this asphaltum?

A. I do not know whether or not it would, but I imagine that it would lose a great deal of its proper consistency. I do not know.

Mr. Yeager: I would like to ask you to make a little clearer the distinction between what you are calling sun scald, and canker. You spoke of canker first, and later of sun scald. Are they identical, or is there any difference?

A. You misunderstood me. I did not speak of a treatment for sun scald. What I consider sun scald is merely the bark freezing off sometime during cold weather and destroying its growing power, and consequently it cracks, and you are going to get an infection in there, and set up a canker growth. We have found that a great many times. Sun scald is physical.

Secretary Marshall: I would suggest that you tell them where they can get this asphaltum, to cover these wounds with.

A. I can't give any specific address at the present time, because I do not remember, but you can write to any paving company and get asphaltum, or any one who handles oil can give you the address of where you can get the asphaltum. Now you who want to try it can use liquid asphaltum. It is an asphaltum that is used in a liquid state by mixing in gasoline or kerosene or something like that, and you can buy it in gallon cans, and a brush to put it on, but the theory is that it is injurious to the growth of the tree.

A Member: Don't you think that raw linseed oil in Venetian red, in almost all cases will keep a wound from cracking? That is my experience?

A. On small cuts that is the best thing we can use. But on the bigger cuts it is not so good.

Q. Put it on twice, just like you would paint a building?

A. Yes, sir.

Q. (By the Chairman). Is there any more discussion?

No response.

QUESTION BOX.

The Chairman: This finishes our program for the afternoon excepting the question box, and there have been quite a number of questions handed in to the secretary, and he will read these questions and will ask any one to answer them who can give an answer. They are open for discussion the same as a paper.

The Secretary: Question number one is as follows:

"What is the proper cover crop for an orchard?" That was partly answered a little while ago. Is there any one who has had any experience with this?

Prof. Green. Mr. President, I come from your neighboring state of Iowa, and from the experiment station there, and I have had some experience with this. If you have a soil that is rich in nitrogen you may use buckwheat, millet, or oats. If you have a soil which is defective in nitrogen, use a legume. We have used this year in our experimental orchards, hairy vetch and rape. The hairy vetch is a plant that has the power to take the nitrogen from the soil and store it in its plant tissue. The rape has the power of storing phosphorus in its plant tissue. The rape however, doesn't have the power of taking it from the air as the legume has the power to take nitrogen from the air, so that I think from the conditions here, the rape has the power of making a good cover crop, which is like buckwheat—it gives a quick crop and does not hurt to kill out in the spring. We also like to use oats in some cases. We like vetch, and buckwheat, and have used cowpeas, but do not like them so well. The vetch, buckwheat and rape have suited us best.

The Secretary: Question number two, is as follows: "Give formulas for spraying orchards?"

The Chairman: That will be discussed tomorrow afternoon.

The Secretary: Question number 3 is as follows, "What is the paint best for covering pruning wounds?" I think that question has been answered.

The Secretary: Question number 4, is as follows: "Should cherry trees be pruned?"

A Member: I will state from our locality, and that is all I can answer for, that if you will prune cherry trees it will kill them. That is all I can say, because I have tried it to my sorrow.

Mr. Aldrich: Why do cherry trees just shortly after they get to bearing frequently die out?

Mr. Christy: I have noticed quite often that where these trees do die in that way that there is a hardpan just underneath, that is very shallow, and the root of the trees can not get through it very far, and the roots of the trees are killed out. I think I have some that are 25 years old, and they are still bearing.

Mr. Aldrich: That is all no doubt very true, but is there anything the matter with the stock. By using different stock, or paying more, could we get a more enduring tree.

The Chairman: The cherry stock as we use it here is almost universally imported from France. Either the seed or the roots are imported from France. This produces a dwarf tree and it is always short lived. My experience with cherry trees has been either some injury to the root which is caused by grub worms, or a fungus disease which attacks the root, are responsible for the death of cherry trees. These diseases are or were imported from France a few years ago, and proved very destructive to trees, and killed large numbers of them.

Mr. Benz: I would like to ask the difference between the Mahaleb, and the Mazzard?

S. A. Marshall: We experimented with them in Washington county some years ago, and the Mazzard seemed to be rather tender, and the winters seemed to hurt it. We could not get the trees big enough to tell whether or not they were healthy, and so we gave the Mazzard up as a bad job in this country. I would take the Mahaleb every time.

Q. On account of too much moisture?

A. Because they won't stand winter well. Another thing, which it is very susceptible to, and that is rust. I believe that is the biggest enemy we have. I believe its worst day is over. Of course it revels in wet seasons, and in dry seasons it can't grow. Therefore our cherries seem more healthy in dry seasons. Another thing, and that is, that this injures the dark cherries much worse than it does the light cherries.

The Secretary: Question number 5 is as follows: "Is it advisable to plant an orchard for home use in District No. 19. Namely, Garden county. If so, I would like to know the varieties best adapted to that locality. The best location for an orchard, whether on a north slope. The method of culture the first years; and about a windbreak; the quickest growth and the most advisable."

(Signed).

F. L. BACKENBERG.

Mr. Benz: I have the honor of coming from Garden county, but I am not the man that submitted that question. I would like to hear it answered. We have quite an experimental orchard there. Mr. McCormick has demonstrated a good many things I think the facts that this gentleman wants to know, Cal McCormick of Llewellyn, who is growing apples by the carload, can best answer.

Q. Is it dry farming?

A. Well, sir, he does not irrigate; but may get the benefit of seepage for the reason that his farm is along the ditch, but he does not apply any water to his trees.

Q. How far above the orchard is the ditch?

A. Well, you mean how high?

Q. No, the distance from the orchard to the ditch?

A. In some cases it is half a mile, and the trees farthest from the ditch seem to be doing as well as those nearest the ditch.

Q. I do not think there would be any chance for seepage of the water.

A. I do not think so myself, but that question is raised by a good many people.

Q. Will not the natural formation bring water from below?

A. Well, he is not in the Platte valley, exactly. It is at the confluence of the North Platte and Ash Creek, possibly a couple of miles, and it is considerably higher than the Platte valley, and the depth to water there would be 25 feet, I should think, and the condition as far as the water is concerned, would be perhaps not unlike the conditions which prevailed to a large extent in that western country in the sand hill district.

The Chairman: There is in our recommended list that I spoke of in the commencement of the meeting, a list prepared for District 19, which covers all the knowledge that this society had of that district up to the time of the making of that list in 1905. And since that time there have been a few other facts gleaned, and that is why I recommended a revision of the list. I can not tell you what they are now, but they are to be found in every copy of our report.

The Secretary: Question number 6 is as follows:

Mr. G. A. Marshall in his paper, said to begin the trimming of the young apple tree according to the natural form of each respective variety. Absolutely correct, but, how can the layman, who most needs instruction, know the correct shape which different varieties should be given to comply with this fundamental idea? One can not, generally, visit a lot of perfect specimen orchards; one does not even know where to find them. A few well-made cuts from photographs of perfect and improper specimens, representing a few of the several and most different types, printed in the next issue of our year book, would be an excellent way of instructing those of us who are anxious to learn exactly how the different leading varieties should be correctly trained by pruning.

Respectfully submitted,

C. J. ERNST (A Life Member).

A Member: Mr. Ernst's point is well made, and I think, too, that the experience of Mr. T. E. Snodgrass along the line of how to trim, would be very well taken if it were published.

Mr. G. A. Marshall: That paper of Mr. Snodgrass's was listed in the index, but it is not in the report. It is a valuable paper and was given five or six years ago. It is indexed, but you will go to the index and you will find it, but go to the page and it is not there. The point I want to bring out was this, that you could not trim all the varieties of apples the same. You could not make a Whitney grow as a Winesap. I am sorry for our people in Nebraska, that they do not try to learn more about trees. Now you can go to the well up-to-date farmer and you ask him about his corn and clover and cattle and sheep, and chickens and even his children, and he could tell you their names. But abso-

lutely he doesn't know anything about his orchard. It is there, and that is all he cares. It is a shame to have this printed in a report to a state as old as this, but I guess we will have to do it. Every farmer should know the shape they grow, but if they don't, I guess we should print it. There are a lot of us can't read, so I guess we will have to be shown by picture.

Mr. C. G. Marshall: Mr. Chairman, we have with us Professor Laurenz Green, of Iowa, who is assisting us with the demonstration work, and also taking part in the discussion, and I move you that Professor Green be made an honorary active member of this society.

Seconded. Carried.

Mr. Green: Without taking any more time, Mr. President, I appreciate the honor, and I wish to thank your society.

It now being 5 o'clock p.m., January 21st, the society adjourned until 9:30 a. m., the following morning, January 22, 1913.

9:30 a.m., January 22, 1913.

The society met pursuant to adjournment, and the following proceedings were had and done.

STATE FLORISTS' SOCIETY SESSION.

Irwin F. Frey, Chairman: The meeting will now come to order. The first thing on our program will be the official business meeting of the State Florists' Society. We will take up the minutes of the last meeting and have them read.

Mr. Henderson reads the minutes of the last meeting.

Report accepted.

The Chairman: The next business to come before the meeting will be the election of officers for the ensuing year. The first office to be filled is the office of president.

Mr. Green: Mr. President, I would like to place in nomination the name of Mr. Ed Williams of Grand Island.

No further nominations. Upon motion that the rules be suspended and the secretary be instructed to cast the unanimous ballot of the society for Mr. Williams, the motion was put and carried unanimously.

Mr. Williams: Mr. President, and co-workers: I appreciate the honor. I assure you I have been a worker for the cause and I will endeavor to give you the best there is in me. I thank you.

Mr. Williams: I would like to now in place in nomination the name of Mr. J. W. Lawson, of York, for vice-president.

Mr. Green: I move that the rules be suspended and that Mr. Lawson of York be unanimously elected as vice-president, and the secretary be instructed to cast the vote of the association for Mr. Lawson. Carried.

Mr. Lawson: Mr. Chairman, our next office to be filled is the office of secretary.

A Member: I place the name of Mr. Louis Henderson in nomination for the office of secretary.

Mr. Williams: I move that the name of Mr. Henderson be made the unanimous choice of this meeting, as secretary for this society. Seconded. Carried.

The Chairman: Our next office is the office of treasurer, and we will now receive nominations for this office.

A Member: I know that my friend, Mr. J. E. Atkinson, would like to hold the office for another year, and I place him in nomination.

Mr. Green: I move that the secretary be instructed to cast the entire vote of this association for Mr. Atkinson for treasurer. Seconded. Carried.

Mr. Chairman: Our other officers to be elected at this meeting are the trustees. Are there any nominations for these offices? Our trustees the past year have been Mr. Williams and Mr. Davidson and Mr. Green.

Mr. Green: Two of them have been all right. The other one has not been worth much. I would like to nominate Mr. C. H. Frey, and Mr. Davidson and Mr. Pence. Seconded. Carried.

The Chairman: If there is no other business to come before the meeting we will proceed with our program. Our first paper this morning will be "The winter blooming plants," by Mr. C. H. Frey, of Lincoln.

WINTER BLOOMING PLANTS.

C. H. Frey, Lincoln.

I have not prepared a paper; in the first place, I have not had time, but I will take up a few varieties that are common to all of us and discuss them. I suppose this will be of interest to those that grow for the market.

I will give a few thoughts,—in other words, a few of my ways of growing, and more can be brought out in discussion afterwards, that will be of more interest to all of us.

The first variety I will take up will be the cyclamen. The cyclamen is the most satisfactory of all the winter blooming plants we have. In the first place, to begin with the seed. I think while there are a great many varieties on the market, or in other words, different types, the best is the German strain. Among the other varieties, for instance, take the English varieties, they are beautiful, and have larger flowers, but there are a good many of them that have poor shaped plants, and there are a good many of the colors that are not desirable. By selecting the German strain we can get types almost true to color, and the flowers are large enough for all purposes. The seed should be sown, in order to get good stands for the following winter, about September 1st. or even the middle of August; from then on to the middle of September. Then you have for the winter following, stands from four to six, or seven to

eight inch pots, and these by sowing the seed early, and growing them in a warm place, in the young stage, you get plants that will make specimens for the following winter. Many make a mistake by sowing the cyclamen too late, and then setting them in any old corner to take care of themselves.

There is not any plant that will stand neglect such as the cyclamen. I generally sow the seed in places covered with glass, for three or four weeks, and after the third week, a few of the seedlings begin to show and the glass may be removed, and still kept shaded on the bright sunny day, and then about six weeks later, the plants will be large enough to transplant, to pots or flats, and they will stay there until March or April, and then they should be repotted. I generally use a three-inch pot, and keep them growing. Most of the cyclamens will ruin through the summer, by letting them become hard, and pot bound, and not letting the sun have sway for a few hours. And they will become hard and then it is almost impossible to make a plant out of it. The trying months are through the hot months of the summer, say July and August, and the first part of September. While they require lots of heat in the small stage, they will become well established in a three-inch pot, and they like a cool, shady place, and shade and moisture over the foliage. While it is impossible to grow a cyclamen in some places, like Nebraska, on account of our hot summers, and dry summers, yet we can, by keeping them in a house that is well shaded, or outside by warm shade, grow good plants. I have seen them in Denver, a good many times, and the seeds sown at the same time I have sown mine, and two or three times as large, but out there they have nights that are cool, and thus revive the plants so that they will stand through the day.

Next, we take the primulas. I think the one that is the most important for us is the *Obconica*. I will say that the seed should be sown about this time of year (Jan. 24th), to get good flowers for the following winter. With the cyclamen, I do not mean to say that in fifteen months you could have a good sized plant, but I mean the second winter afterwards if you sow the 15th of September. But the *Obconicas* will be sown this year, and you will have good plants the following winter. The seed of these can be grown very easily in a small house with a temperature of 55 or 60, but later on they need a cool place, and the following winter they require a temperature of 55 degrees, or even 50 to get plants that have good foliage, or even large flowers. You get better shaped plants and two or three or four times as many blossoms.

The Chinese primulas are grown by a great many and are shown to be generally profitable. These can be sown in April and May, and even sown in June, and you will get good formed plants for the following winter. The seed will not all germinate at the same time. There may be a month's difference and by picking out the small plants you will find a number of plants for several months afterwards, that will still keep coming up, and these require about the same temperature as the *Obconica* but they will absolutely refuse to have water on the foliage. And they

must be watered all the time, especially when the plants have four or five inch pots.

There was a new one that came out four or five years ago, the *Malaoides*. It is a beautiful plant and is good for advertising work, on account of the long sprouts and graceful flowers. You can have five or six inch pots for the following winter. They require a dry, cool atmosphere.

Next I will take the begonias, and just mention a couple of types that are grown as winter blooming varieties. One I prefer above all others is the *Cincinnati*. While this is a newer variety, the flowers are so much larger than the old type that there is hardly any comparison, and it will hold its flowers. You will probably all know that every one of the old kind that was sold dropped its flowers about the second day it left the store. The *Cincinnati* will hold its flowers for a week, and I have had *Cincinnati* in the greenhouse for four or five weeks, in a salable condition. It will hold its flowers in the greenhouse, and is a much easier variety to grow. It is propagated from leaf sprouts. It should be done from this time up to April and May, and you will get good plants for the following winter. Take a medium-sized leaf and insert it in the sands and keep the leaf from touching the sand, and about five or six weeks after putting them in the sand they will root, and a good many of them will begin to show growth from the beds, and then they can be potted up in a very light porous soil. All begonias won't stand water around their feet, as the saying is. When a begonia becomes soggy or in a soggy condition, the plant will soon become ready for the dump heap. While these young plants will not make much growth in the summer, yet in the fall of the year when the weather begins to get cool the plants will grow like weeds, and by the middle of December it will make five or six inch plant for the holiday trade.

There is another variety that is very cheap,—this *Cincinnati* is too high-priced to buy for many of us. Young plants in two inch pots for summer delivery have cost \$15 to \$18 per hundred, and they probably will, for some time to come. But the variety that has been on the market for several years, and the old fancy type, the *luminosa*, of which I had a few last summer and winter, there were only three or four that varied from the ordinary. All the others were an even shape, and it was an even good summer bloomer. All begonia plants are hard to take care of, in the first stages of growth. The seed is so small that it will stick to your finger, if you put your finger in a package they will stick all over it. And while they are sown, if the pan or pot is not watered carefully they will all wash in the lower places. Just sprinkle the seed over the top and not cover it at all, and they will come up even. I generally get them on the point of a lead pencil and just push them into the soil, and after a month or two in the flats, after being transplanted, they begin to grow very rapidly. This will make plants as large as you want them for the following winter. If the flowers drop, the next crop

that come or the buds that are on there will keep developing and blooming all winter. It makes a good plant for window boxes, and outdoor work where there is a particularly shady position.

Another plant for a Christmas plant, and one which is probably the most important of all, is the poinsettia. At this time of the year put them under the benches in a warm, dry position, and leave them there until April, May or June, and set them up, and in two or three weeks you can have all the goods you want for summer propagation. These are easily rooted in a propagating bench. They require a good rich soil and not too much water to the roots. Of course take an early propagated plant and pot it, and it is too much of a shift at a time and the plants become too large. But by giving them two shifts and keeping them growing on the dry side, you will get a large plant for the following Christmas. While these are not satisfactory for a house plant, yet they are a good Christmas plant, and will last longer than cut flowers, and everybody will advise people to buy the poinsettia for Christmas. In fact, the past winter there wasn't near enough to meet the demand. Many more could have been sold. These, after the bracts begin to form, require lots of heat, and you want an even temperature, and a moist house.

Take the cineraria, and that is another plant that is grown in great quantities, and while they do not last long as a house plant, they will last long if you will give them lots of water, and you will get colors in those you do not get in any other winter blooming plant. The seed should be sown in June or July to get good plants for the following winter. The great trouble with the cineraria is to carry them through the hot months and the hot summer to the cool weather, but by getting a good shady place, watching them carefully, and getting them past the middle of September there is no bother with them at all, and they will grow any place. But in order to get them in good shape and have the flowers last, they should be grown in a temperature of 50 to 55 degrees and kept on the dry side when the flowers commence to develop. If you take them to a house where they will dry out as fast as they will in the greenhouse, they won't get water enough to keep them in condition. A great many times I have seen them taken to a dwelling house and over night I have seen them drop down; the next morning they would come back and say it was frozen or something of the kind.

Take the azalea. That is the plant that almost all of us will grow, and have grown, although not all of them will grow. These are imported from Belgium and they must be soaked well before they are potted. And I generally put a lot of water around them. When they become dried out it takes quite a while to soak through, and by leaving them stand in the water a few minutes they become soaked up enough for potting.

If you want them for Christmas keep them in a cool place for a week or two and then keep them in heat starting at 60 degrees, and then after a week run up as hot as you can until the flowers commence to

show color and then when the flowers commence to expand set them in a cool place again.

While these do not last a great while after they are in full bloom yet they are beautiful, and people get more for their money in buying azaleas than they will in buying a bunch of flowers, and they have something that will last longer than a bunch of roses or carnations by getting them where they will be protected, and giving them plenty of water.

Another plant that is not grown as much as it should be for a house plant, is the rhododendron. Of course this will not last a great while, after coming into bloom, but the flower is so beautiful and makes so much show that if we all grew a few of them, if only a dozen, by bringing one or two of them into heat at a time, we would have them for all winter. I think we will all find they will sell. They are not very expensive to buy. While it seems a good deal to pay the price that is asked, yet I never have any trouble in getting four or five dollars for a good plant, and yet there is not as much profit in them for me, as in some other things I grow. They usually come at the time that the azaleas come or a little later, and by setting them in a cool place, moistened for a few weeks, and then bringing them into heat and continue to spread the foliage they will soon come into bloom and they will last well, too. I had a few plants of an early variety, I forced for Christmas, and they were left in shape for today.

There are probably not many of us that have grown lilacs as a winter blooming plant, and yet by importing a number of potted varieties you will get a nice plant with a number of flowers. These will force very readily any time in the winter, and of course if we force them too much, we will not get any foliage, but all flowers, but after the first of March they will have good foliage, as well as better flowers. And if they are forced too much in the early winter, the dark colored varieties become almost white and later on they have a good color.

Another common plant that is used for house plants and buying is the geranium. By taking the plants the first of the year, and up to June, and by keeping the flowers spread out, particularly for fine specimens for the following winter and while this will not bring much money they will sell, and it is something that everybody knows, and everybody can grow. Now I have said what I have to say, and if there is anything that can be gotten out of the discussion, I wish you would ask some questions.

A Member: I would like to ask in regards to carrying over cyclamen plants, whether or not you think it is profitable for a florist to do that, or to sow his seed?

A. I do not know, I never carry them over. When they are through blooming they go on the bum. Of course you will not have good plants carried over. In fact, years ago when I first commenced business, some thirty years ago, cyclamens in bulbs were sold the same a lilies are to-

day. No one thought of growing from seed. I remember when I first commenced growing from seed. I had florists from different parts of the country in and asked me how old they were, and I would tell them and they would not believe it, and they did not think it could be done. But they were not posted, and they did not know. The trouble with the old bulbs was that they make lots of foliage, but no flowers. And while you get some beautiful plants, and even large ones, yet large ones can be grown from seed in the period of fifteen or sixteen months, and with the bulbs there are too many that will not produce flowers enough to pay to bother with them.

A Member: Do you grow any of your own seed, or do you save any of your own seed?

A. Yes, sir. All of it I had last winter was my own seed and that is a better way to obtain seed, providing you save some of the better plants. We pick out our seed plants and set them aside, but if you sell the best, and try to save seed from what is left, you soon have a coarse strain. But if you save your best plants you will get better flowers and better plants from the seed you get.

Mr. Green: Now about that seed proposition. We save all our own seed. I take five plants of each variety and we keep them around in different places. We designate them so we will know. We have the bright red and fringed set off by themselves. And we take five plants of the blood red and set them away. And the pinks we take a very light and a very dark and set them off some place; and the only trouble is, we have a woman come up and want to buy it, and we sometimes lose them in that way, and after all, our own seed, we find, takes much more trouble and time and money to get it than anything we can buy. If we have a particularly good plant we carry that over for seed for next year. The old bulbs will not make as many flowers, but each bulb will make more seed.

Mr. Frey: The trouble with saving seed plants, so many of the flowers come off. The flowers seem to wilt.

Mr. Green: Did you ever try fertilizing with a camel's hair brush?

A. Yes, sir.

Q. I think that is a good way.

A. Yes, sir.

A Member: What variety of lilacs do you use?

A. Charles X. C., Marie Legrave and the Lemoine is beautiful, only they won't have as many flowers. Charles X. C. is the best one of all.

Q. What price as a rule, do you have to pay for them?

A. They cost about 85 cents apiece in Chicago. They are bought more, and grown more, in about ten-inch pots. They cost about \$40 a hundred on the other side.

The Chairman: With your permission, I will change the program a little, and as one of our speakers this morning wants to leave on an early train, we will have as our next paper, "Growing Sweet Peas," by J. W. Lawson of York, Nebraska.

GROWING 'SWEET' PEAS.

J. W. Lawson, York.

Mr. Chairman, Ladies and Gentlemen: The subject I have been assigned is Growing Sweet Peas. The first thing to be considered is the seed. Buy the best seed procurable of any reliable grower or firm. Buy it early, and in advance of time to plant. Don't wait until your neighbors' peas begin to show through the ground, before you plant yours.

In regard to varieties, the grandiflora types are beautiful, but the Spencer varieties are fast superseding them, and are procurable in the same beautiful shades and colors and are indispensable either for exhibition or decorative purposes.

What colors shall we grow? We grow only a few such as white, pink, mauve, lavender, purple, and scarlet.

Next before planting let us consider the soil and the preparation of the same. This soil should be rich and deep and prepared early. The better plan is to prepare in the fall of the year. A good rich turfy loam is the ideal soil for growing sweet peas thoroughly enriched with well rotted manure or bone meal dug in as deep as possible. Before sowing pulverize the soil well in trenches three or four inches deep.

Don't use the same soil year after year.

When to sow: For outdoor planting, sow early, as soon as the frost is out, provided the ground is not too wet, while the ground is cool and moist, which insures good roots before growth commences. Do not sow too thick, thin them out to about two inches apart. We plant in double rows about ten inches apart to lessen space, time and cost of staking.

We find a four or five-foot wire netting held in place by posts, the most convenient method of staking. This should be in place by the time the peas are two or three inches high. Better still, as soon as planted.

Dry hot weather affects the sweet peas very quickly. They should be watered often and thoroughly. A good spraying of cold water evenings after hot days and an application of liquid manure once in ten days also greatly improves them. A good heavy mulch of coarse straw around the peas as soon as the weather is warm prevents the ground from drying out, and keeps it cool and mellow.

The flowers should be cut daily and all seed pods removed as soon as they appear which will greatly lengthen the blooming season, which should last till frost. And by this time the winter flowering varieties, if planted the latter part of July or first of August, will be starting to bloom. For growing the winter blooming peas under glass, the ground bed will be found most convenient. A bed six inches deep filled with a compost of three parts soil and one part well rotted manure in a light, well ventilated house with plenty of head room with a temperature of 45 to 50 degrees at night, and 60 to 70 degrees on bright days.

The rows should run north and south, this gives the plants full benefit of the sun. When the plants reach the height of a few inches they should be given support. The best method for same is to stretch one

wire across the top of the bed for each row and another wire about six feet above and connect with strings and from time to time help the plants to climb.

A sprinkling of air slaked lime, over the row or watering with lime water helps to keep out the cut worms. If the green or black fly attack the sweet peas they should be sprayed with one of the several nicotine preparations. And for red spider use a sharp spray of cold water.

One of the most essential things is the proper feeding. When they are in full growth a change of food is beneficial and when starting to bloom an application of soot greatly improves the color of the flowers and foliage.

We have a second planting, we have started in pots, and we transfer them to the beds. We have never been without sweet peas from the time that spring comes, until it comes again, and we have them out doors, and then by the time they are gone we have them inside; we find them a very profitable flower, any time of the year.

DISCUSSION.

A Member: Do you market your cut flowers locally or ship them?

A. Locally.

Q. What do you get for them?

A. In the winter time 25 cents a dozen, and in the summer time 10 cents a dozen. Of course at times, we sell them for less. During the summer time when there is an abundance, I think we can cut them and sell them for less, but for our retail trade, we can not sell them for less.

Mr. Green: Do you sell your sweet peas by the dozen?

A. Yes, sir.

Q. I will tell you what we do. Sweet peas are always 50 cents a bunch and along in the winter time the bunch is very small and in the spring time the bunch is very big.

A. Well, you can do that, but we price our sweet peas by the dozen but we always mix it up with green. A dozen makes a nice fluffy bunch for a vase.

Q. Do you any time find the market glutted with sweet peas?

A. Yes, sir. In the winter time we never have enough, and in the summer time we have more than we can sell.

Q. You speak of having the rows running north and south, wouldn't you advise trying them east and west?

A. Well, north and south I think is much better in the greenhouse. There are some cloudy days that I think it is better in the main for the rows to run north and south.

Q. Well, where you are short of room, it is hard to do that.

Member: I would like to know the names of the varieties he grows for winter.

The Chairman: I think you will find that the winter blooming sweet peas are several in number, and there are many varieties when it comes to a show down.

Q. Are those the Spencer varieties?

Mr. Lawson: No sir, those are for outdoor blooming. The Spencers will get so high in the greenhouse you must have a stepladder to pick them.

Mr. Frey: About this time of year (January 22) they will not get so tall though. I have a house now prepared to plant of all Spencers for April and May and June blooming. For a Christmas picking the best kind I have got was a Christmas Snow Bird. This being a German variety it will germinate better than any others.

The Chairman: Our next paper this morning will be by L. D. Tyrrell, of Lincoln, on the subject of "Forcing Bulbs."

FORCING BULBS.

L. D. Tyrrell, Lincoln.

If the committee which assigned to me the task of preparing a paper on the growing and forcing of bulbs had known how little real pleasure I have ever derived from carrying around a tray, or a box of bulbs, endeavoring to get them into bloom for some special day or occasion, they no doubt would have assigned to me for my consideration some plant or class of plants more dear to my heart.

For I believe that the average florist gives as little serious thought and consideration to the bulbs which he forces into bloom under glass, as he does to any class of plants with which he comes in contact, that are of so much importance to him. One reason for this is that we take little or no part in the growing of these bulbs, which is left entirely in the hands of our brother across the water, who is better equipped with climate and with soil essential to their welfare, and then when we do receive our annual importation of bulbs, we immediately take them to some secluded spot, and there confine them to their winter quarters beneath the ground where the bulk of them are to remain until the late weeks of winter or the early weeks of springs.

Fifteen years ago a few local bulb and supply houses handled the entire bulb supply of this country. Today there is not a bulb growing concern in Holland which does not have its representative in this country, and who after having once sold you a bill of bulbs, which you will hardly have placed in their winter quarters before you will again find him at your door. Such has become the keen competition among the bulb growers, for the American bulb trade. It is not infrequent that you will meet in your place of business some individual who has traveled abroad, and after looking over your small daily supply of bulb stock, will remark with considerable emphasis, "Oh, you ought to have been with me and have seen the bulb fields of Holland," but if as that individual was looking over those fields of fragrance and beauty some one had told him that more than 65 per cent of the flower producing bulbs of Holland are annually imported to the United States and Canada, to be forced into bloom under

glass by the florists of these countries, that individual would probably have surveyed his informer with awe.

Twenty years ago it was not uncommon to hear a florist remark that there was little or no money in forcing bulbs, and that opinion still prevails to some extent among growers with small establishments. Be that however as it may, I shall not discuss this phrase of bulb growing at this time, for the steady yearly increase in the importation of these little tubers into our country is sufficient evidence in itself that they have at least found a warm place in the hearts of the American flower buying public. Such being the case it is up to the American florist to procure the best stock possible, and to put it on the market in the best possible condition that he may realize a reasonable profit. It is usually along about the middle of September that we receive our first consignment of bulbs, which is usually the florists' friend.

The paper white narcissus which if given half a chance and as much good judgment, will be in continuous crop from Thanksgiving until Easter. At this time we also receive the Roman hyacinths, which on account of the demand for long stemmed flowers has of recent years lost much of its popularity, but a few of these delicate fragrant white flowers can be used very profitably through December, and January, as they force quite easily in ordinary greenhouse temperature.

About a month later we shall begin to receive our Dutch bulbs, and by the first of November we shall have received our entire consignment of bulbs. Having received our supply of bulbs we must prepare trays or flats of a convenient size to be easily handled, three or four inches in depth in which we place the bulbs in a good rich soil about half an inch apart, and press the soil firmly about them covering them entirely; this done, we dig a trench throwing out about three inches of soil, which will give us plenty with which to cover and then place the boxes in rows so that they will be easily labeled with a good long label which will reach well above all covering which they will need as the winter comes on. When you have them all in place give a good thorough watering making sure that they are wet to the bottom for this will have a great deal to do with your future success in forcing them into bloom. It is a good plan to let them stand for twelve to twenty-four hours before covering with dirt, and then examine to see if they are wet to the bottom, then cover with two or three inches of dirt, and add your litter only as you have to, to keep away a hard freeze. This may be followed for narcissus, tulips, daffodils, hyacinths, crocus and so forth.

Cases of narcissus may also be placed in a good cool cellar where they may be kept well into the new year, before boxing which may be done from the potting bench and then placed in a cool house or beneath a cool carnation bench while some prefer to box hyacinths and later pot them from the boxes. I think perhaps it saves time and they do just as well to place them in pots and bury them with the rest of your bulb supply. It is quite easy to bring paper white narcissus and Roman hyacinths into bloom for Christmas, and narcissus may be had for Thanks-

giving if desired, but the new year will scarcely have been ushered in until you will begin to hear from your customers' demands for signs of spring, such as tulips, daffodils, and hyacinths some ten weeks before you are apt to hear that first real sign of spring, the robin's song.

We have now come to the critical time in forcing bulbs. Six or eight weeks later it will be an easy matter, but we have brought in a few boxes of tulips and daffodils, and a few pots of hyacinths. And where did you put them? Beneath a cool carnation bench? That may be all right, but I prefer, if possible, to place them beneath a bench in a warm rose house, under which there is no heat, for these first boxes of bulbs for the first two or three weeks, will grow but little even here; and if we are to have stems of sufficient length to make them salable, we must get them into a temperature which does not fall much short of 75 degrees the entire twenty-four hours or we shall have failure, or at least that has been my experience. If you do not have a small house where you can maintain such a temperature, enclose the end of some warm convenient bench where you have a good bottom heat, make the bench about eighteen inches deep and cover over with glass, and clean all sand and lath from the bench and enclose so you will have a good bottom heat. Put a thermometer in the box and if you are firing steady and your box is enclosed tight, it will stand close to 90 degrees. Put plenty of moss in the bottom of your box and set your boxes of bulbs in, and have cracks between the glass so that you can maintain a temperature of about 75 degrees. Give two good April showers each day, but do not soak unless necessary. Shade over the glass with papers for the first week, or until the plants are well drawn up, then remove the papers at night.

I have found this to be a good process for a florist who only forces a few boxes at a time. It is also well to keep about three weeks' supply of bulbs under the bench at all times, bringing in a few each week, which will give us a continuous crop. It is always the first boxes of tulips and daffodils that give us the most anxiety, and we often become anxious and bring in a few of these bulbs along in December and no matter how we treat them they fail to respond fully garbed, and finally some morning we find an open flower without a handle and without a coat which looks up at us and seems to say, "Why did you disturb me at this season of the year, when everything is fast asleep. I should like to have tarried just a little longer in my quiet solitude, but if you must have me, here I am." And we take off our cap and from our pocket our knife, and cut off their dainty heads, and say, "You will do for a design."

It is hardly advisable to bring in tulips, daffodils, and hyacinths before the first of January or first of February. As to varieties of tulips they are many and varied, not two growers using the same varieties, but there is none in white which forces more easily than the *La Reine*; *Princess Helena* also forces easily but the bulbs are more expensive. In yellow there is none better than *Mon Tresor* for early forcing; *Yellow Prince* is also good; in pink, *Cottage Maid* is good and they are cheap.

In the red and yellow and terra cottas, we find Kaiser, Kroon Duchesse de Parma and Prince of Austria, all of which respond readily.

We should not neglect to buy a few miniature Dutch hyacinths which we should place in pots as they force easily, but mixed colors should never be used as they come too uneven. In narcissus there is none that force so well or have so much value as the double Von Sion. In the single varieties I might recommend the Golden Spur and the Becolor. Emperor and Empress jonquils, and crocuses may be forced in the same manner as bulbs which I have mentioned, but are little used by florists as they are more suitable for bedding when placing our bulbs in their winter quarters. We should not fail to make up a few pans of the different kinds of bulbs which will sell readily at Easter time.

The Chairman: Is there any discussion on this paper?

No discussion.

The Chairman: The next paper will be by Mr. Ed Williams of Grand Island, on the subject "Growing Lilies for Easter."

GROWING LILIES FOR EASTER.

Ed Williams, Grand Island.

I believe that the speaker before me, Mr. Tyrrell, said a whole lot when he said that we did not have anything to do with the bulbs. That our brothers across the water did that part of it. All we had to do was just to take them and pot them and box them and bring them into the greenhouse, and give them water and so forth. The only thing we have to do is to get them here on time. When we want lilies for Easter, we want them for Easter, and when we want a flower for Christmas, you want the flower for Christmas, and the florist who will have his flowers on time, will make a success of the business.

I would like to say before I start this paper, that there are hardly two florists that grow lilies in the same way.

The subject of Forcing Lilies for Easter having been assigned to me, I will endeavor to give you my method of treatment. I have tried different ways to grow lilies, and have found that this method is the best from several different standpoints. I have grown them for several years this way, and have had good success and that is what we all are after.

Of course you all know that there is no set rule to go by, in growing any plant. A grower has to use good common horse sense and be able to tell at different stages of growth, where they are at. As soon as possible, after arrival, which is in July, we put them into four-inch pots, using a compost of three-fourths sandy loam and one-fourth well rotted cow manure, being sure to give plenty of drainage. Lilies do better in a light soil. We place the pots in a cold frame when ready to water and we give them a thorough soaking. Then sprinkle a little sand over them; this is to keep the old soil that we cover them over with, from sticking

to the pots: we cover them to the depth of three inches with the old soil. If the weather is dry, we give them another soaking before covering them up with the manure which we put on to the depth of five or six inches. As soon as the early chrysanthemums are out of the way we start taking them into the house. After they have stood on the bench for about two weeks, the growth has hardened up some, so that the repotting can be done. The size of the pots depends on the size of the bulbs. We put bulbs, known as five to seven, in five-inch pots; the size seven to nine in six-inch pots. Several growers waste lots of valuable space by potting into too large size pots. A bulbous plant don't need as much soil to grow in as other plants do. In the repotting we select the strongest plants first, leaving the weakest ones until we see whether they are going to make it or not.

Right here is where you are going to save a lot of valuable space, for if you had them in larger sized pots with the idea of not repotting them at all, all the weak and diseased ones would be using your bench room. The watering should be looked after very carefully for about three or four weeks, after this last shift, for this is the making or failure of the lily. Constant syringing is what they like, every day. Oftentimes florists are complaining of short stems they get on their lilies. If they would syringe oftener they could get these stems,—and right here let me say that the treatment of keeping them out of doors in the frame has something to do with getting a good stemmed plant. The lilies when brought in, should be given a temperature of 52 to 54, night heat, and as they take hold of the soil the temperature can be increased as required. Of course it depends on what date Easter falls on. This year Easter is very early and these that are going to get their lilies in will be doing well. I am referring now to the small grower. The large grower has the advantage of being able to move his plants around so that it is seldom that he misses out entirely but it is different with the small grower who only has a certain house for them, and has to keep them there. If you see that you are going to have to push them don't be afraid to give them heat. Just as long as you syringe them often, you may give them heat, but don't wait until the last week and then force them so hard. Start in time so that you won't have a batch of soft off-color blossoms. It takes seven to eight weeks to blossom from the time you can count the buds at 60 to 62 night heat with fair sunshine, or in other words a good rose house temperature. The aphid loves the lily, so keep them clean at all times, for if they get a start on you, they will be hard to get rid of, and they can do lots of damage in a very short time. Fumigating is the common way to keep them clean. Make it a practice to fumigate once a week, or if you are situated so that you can't, you can keep them clean by dusting them with tobacco dust.

Staking the plants is essential so as to get good straight stems. If your lilies are showing buds too early, which seems to be the case with some of them, don't make the mistake of putting them in a cold, or rather too cold a house, for the set-back they will get will stunt them and be the

cause of getting small flowers. There is no danger after the buds begin to turn for then is the best time to hold them back.

A good cellar is the best place to hold them back, where it is dark. I have kept them in such a place for a period of two weeks, bringing them up a few days before Easter, so as to harden them up before sending them out. In handling lilies, care should be taken so as not to shake them around too much, especially those that are not staked, as the stem is very weak, at the base of the plant. This method of growing does away with that to a certain extent, for in repotting, you can set your plants down in the pot.

As to varieties, there are many. I think that when placing your order for bulbs, in the fall, a thought should be given as to the date Easter falls on, the following year, as some lilies force easier than others. The *Harrisii* is the easiest one to get in early. I am growing them as my main crop this year. And they are uniform in size and height, hardly any diseased ones, and they are about to show bud now, which with ordinary heat will be just right for Easter. I am also growing the *Formosum* and *Giganteum*. The *Giganteum* is a prettier lily than the *Harrisii*; the flowers stand up nicer, but they require more heat. The *Formosum* is a good one to grow, as a batch of them will give you flowers through the winter months, but is not a lily to depend on for Easter.

I will conclude by saying that getting lilies in for Easter has put more gray hairs in the florist's head than any other plant he grows, for failure to get them in on time means a big loss in time, space and money. Some florists have to resort to giving the plants a watering of warm water twice a day. More or less of the remaining dip their heads in warm water. I have gotten up, twice a night for several nights, prior to Easter, when I had to resort to hard forcing, where we grew several thousand plants, and with the aid of the fireman's lantern, syringe the house so as to get the moisture. And some of them, looked as if they had gone through a siege of smallpox when I got through with them. But lilies for Easter was the slogan, and lilies we will have at any cost. So when the clergyman comes with a poor mouth, don't be too hard on him, and count the buds too close.

The Chairman: Is there any one who has any question they would like to ask Mr. Williams.

DISCUSSION.

Mr. Green: Just one question or suggestion I would like to make, and that is in regard to the *Formosum* lily. The average small florist does not grow enough of them. We grow them in the fall, and begin to grow them and cut them steadily up along to Decoration day. They all had the same treatment exactly, but some of them were eighteen inches high, and some of them were seven or eight feet high. Another thing about us small fellows: I am a small grower comparatively, in a small

town; now the cold storage Giganteum, there are a number of wholesalers who are putting them out in large lots. It is a good idea for a small grower to have a hundred or so come along the first of every month, from February, or January and March on up to the first of May. Pot them up. That will give you a steady supply of lilies on up through the summer months. It is almost impossible to get the Formosum at this time of the year, they are not on the market.

The Chairman: Get the bulbs in the fall.

Mr. Green: My idea was to buy Giganteum. We are planting 100 bulbs the first of January, and will plant them the first of March. And we will get lilies all the time, instead of using specimens.

Mr. Frey: We commence getting our cold storage lilies the first of March, and from that time on, we get them. We have been getting our Formosum lilies since Christmas, and will have enough lilies for every day use up to Easter, and then they will straggle on that way.

Mr. Frey: I do not believe it would pay a small grower to have Harrisii except in two or three cases, maybe. There are places where I have been, where they were Harrisii and about 60 or 70 per cent of them were diseased. Once in a while somebody will get a case of them that will be good. I believe that the best lily for the small grower to grow would be the Formosum. There is very little disease in the bulbs, and practically all of them come clean. Out of 100, there will be 50 or 60 per cent of them that will be anywhere from two to three feet, and they have good foliage. I remember I bought the first case of Harrisii that ever came west, about twenty-seven years ago, and out of that 100, there was 101 bulbs, and I had 101 plants, and every one was perfect, and while they grew about five or six feet high, not every one of them was a perfect plant, and they ran from fifteen to sixteen flowers, and today out of the same bulbs, you will get about three flowers. Personally, I grow Giganteum for Easter, but I give them heat. The bulbs arrive here about November, or the last of October, and they are potted immediately, and I let the pots get well filled with roots and give them heat. I do not mind 80 degrees at night, in fact all I can give them. And by Easter you will get a flower that is a good deal larger, and has more substance than any that can be grown.

Mr. Williams: The small grower can't give them that heat. That is the trouble with the Giganteum. I have grown them for the last three or four years, and I found that I lacked the heat that was necessary for them, and so I could not handle them. I ordered Formosum, and there are several others that are smaller than I am, and some that are larger than I am, and they are in the same fix. So I tackled the Harrisii for my main crop, and I have 2,000 as pretty plants as you ever laid your eyes on. They average twenty-four inches high, and have good straight stems, right down to the pot, and I have seen hardly a diseased plant in the bunch. If you can get Harrisii like that I think they are good to grow, because you can get them into blossom without much forcing, and it saves the florist a lot of worry. Of course, the Giganteum, as I said, I have put

them in where Easter comes along in April, for that is in time, but where a small florist can not give them that heat you mentioned, it is no plant for him. Take the small florist, he will buy just a few hundred bulbs. And you take 200 Formosum bulbs; he can not tell, and you can not tell, how many plants you are going to get in for Easter. You might be lucky enough to get them all in, but personally I believe that you might have them from seven feet high to an inch high, that has been my experience with them.

Mr. Frey: I do not believe that it pays a small grower to monkey with them. The last few years I had *Harrisii* there were very few plants that were not diseased. Of course there are a number of good ones. You may have had a good grade of bulbs. You may not get the same grade of bulbs the next year.

The Chairman: The next paper is by Mr. Green of Fremont on the subject of "Cut Flowers for the Summer Months."

CUT FLOWERS FOR THE SUMMER MONTHS.

C. H. Green, Fremont.

Mr. Chairman, Ladies and Gentlemen: When I got into this subject I found it was a big one, and in a paper that is given in a short time here it must naturally be a great deal like the blue sky, it must cover everything and really touch nothing.

So I have prepared a paper along the lines that I thought would be the most desirable and tried to cover the ground as best I could.

It is rather peculiar, but none the less true, that the average retail florist has more difficulty in filling his orders for cut flowers during the summer months when flowers are supposedly plentiful everywhere than at any other season of the year. During the last half of June and through July and August when the two great staples, roses and carnations are practically out of commission the constant demand must be supplied with other stock.

True the demand is not so great as during the rest of the year, but what there is, must be taken care of. This demand must be met principally with stock grown outside of greenhouses. It must be in constant supply, and of a nature that will keep without wilting until it has served its purpose. Near the great wholesale supply centers, there are of course specialists, who grow summer stock and of whom it can always be obtained, but what we are interested in, is how to produce it at home and keep down our wholesale bills. There is no general rule to follow as to what to grow and how. We must each figure out the needs of our own particular case. I could not tell you what you would find most profitable, but will give you a brief outline of my own methods and experience.

Asters are without doubt the most important of all the summer flowers. I might say everybody grows asters. We plant our main crop in the open field, but last summer the best flowers we cut were from

plants grown in a cold frame and watered regularly. Hereafter we will continue to plant a goodly lot in the field but we will also make sure by planting a couple of frames also.

We sow the seed in series of plantings about three weeks apart. The first sowing about the first of February. This is a small lot of some early flowering white sort, and the plants are shifted along as is necessary until room can be found to plant them into a partly empty pansy frame or on the bench inside. For this very early sowing, it is well to avoid getting more than can be taken care of conveniently. They will run up to a flower if allowed to become root bound in the flat or small pot, and they are practically worthless.

Our second planting consists of Queen of the Market in the three colors, white, pink and purple. There are a number of other shades of this type, but we think it better to have a few colors and lots of them than the reverse. About March 1st, we sow a crop for the retail plant trade. For this we use Semples Branching, and all the shades we can get,—white, light blue, pink, red, lavender and purple. Last year we made a special low price on the plants by the dozen and found they sold rapidly and generally gave satisfaction.

For our own flowering the Queen of the Market are followed by white and pink Crego, and they by the Peona Flowered, in white, pink and purple. There are a number of other sorts or types, other than the ones I have named here, equally good perhaps, possibly better. We saw what is perhaps the newest of the improved sorts at the Florists' Sawyer Asterium. They were Crego or comet type, very large with good centers. The white and lavender were better than the pink of the lot we saw.

The seed may be sown either in flats or in soil on a bench. We prefer the bench seed bed to the flats as it is easier to control the moisture. We sow in rows an inch and a half to two inches apart, in preference to broadcast, as it gives us a chance to stir the soil occasionally.

The first planting is made in the field and the last week in April or early in May and the later ones follow along through May as the weather, our judgment and convenience may prescribe.

We do not make a practice of watering the plants in the field, although we have facilities for doing so, as we believe that careful and constant cultivation of the soil is just as good, if not better. Those grown in frames on the other hand we give plenty of water.

Next to the asters in importance, we would place the gladiolus. They are easily grown, the bulbs are not expensive, and the blooms are very satisfactory to the buyer. They are showy enough to be useful for store window decoration, and are in season when material for this purpose is none too plentiful.

The blooming season can be prolonged by planting in succession during the month of May. We dig the bulbs after they have ripened well in the fall and store them under a carnation bench until spring.

We sell quite a number of bulbs during the spring plant season, which

we are generally able to do without depleting our stock, for as it is, they increase in numbers considerably in the field.

There are a great many varieties, many of them very choice. We grow but one named sort, the America, a large and very beautiful pink one. Our main crop is a strain of Gandivensis hybrids, assorted. In these we have a good range of colors that answer our every requirement.

We have a bed of roses six by one hundred, that come in mighty handy where there is none to be cut inside. We just filled up an old sunken hotbed with good rose soil, leaving the old manure in the hot bed, and then planted Kaiserins, Killarneys, pink and white, Gruss and Teplitz, and a few Clotilde Soupe. These, we shade with lattice made of lath as a partial protection from the sun. We keep them watered and the oil stirred until the middle of August, when we apply a heavy mulch and discontinue the watering.

They continue flowering after we stop the water but slack up gradually on the production of new wood and harden up for winter. We get some good flowers in this way. In fact, the first prize vase of cut roses at the state fair was cut from this bed one year. The varieties we are growing continue to bloom quite awhile after frost. The winter treatment is simple and easy. After a few killing frosts have ripened them thoroughly, we cover the bed with straw, working it well in between the plants, and leaving them in their natural upright position. Where necessary, a long cane, or an overgrown plant is cut back to about the general height, so the covering of straw is just about as deep as the plants are high.

About, or soon after the middle of December, a further covering of straw is put on. This is just scattered over tops and all. Nothing more is required until about the middle of March, when part of the covering is taken off. Not all off though, because a warm spell would start them into growth before the danger of hard frost is past. We take off the rest of the straw in April, keeping it on as long as possible. If the weather is warm and starts the growth under the straw, it had better be off. As soon as it is off, we cut out all the dead wood, stir the soil well and they grow like weeds. An occasional plant will be killed down almost to the ground but that seems to make no difference with their growing strength.

The Antirrhinum or snap dragon makes a good summer flower. We grow them for seed and sow early enough so we can let them make a flower before we plant them in the field. This gives us a chance to select the most desirable shades. The seedlings are very tender when they first come up, and should be transplanted, as soon as they can be handled.

We have found the chrysanthemum maximum very useful as a summer flower. It is really a hardy daisy, something on the order of the Shasta daisy but in our opinion far better. They bloom constantly and abundantly from mid-July till hard frosts come. They are hardy so far as cold is concerned but can not stand cold and wet together. We dig such clumps as we want from stock after they have ripened well and put them in a frame, covering them well with leaves or rubbish. During

February or March we bring these clumps inside and let them thaw out. Then we divide the root and pot them into two and a half or three inch pots. Planted in the field early, they grow rapidly and furnish an abundance of long stemmed good sized daisies that are very welcome.

A short row of double white petunias, and one of double alyssum, every florist should have.

Sweet peas are another good summer flower though at our place we have them all winter and make a specialty of selling the seed in the spring; we do not pay as much attention to the production of the cut blooms in summer as we would otherwise.

We grow some, however, and find them profitable. One mistake that is made in growing sweet peas is to plant too many. If your planting is so large that you do not need all the flowers produced you are pretty sure to neglect the picking and then it is only a short time until they stop blooming and you have none.

We have a number of other good things that might be included under this head. The peonies and hardy phlox are both desirable and profitable. Those varieties of peonies that will bloom by May 30th are our money makers. The spring of 1911 was an exceptionally good one for peonies with us.

Weather conditions were such that the crop came in just right for Decoration day and we sold \$600.00 worth of blooms from a plot of ground not as large as an ordinary city lot. Last season they were later in blooming and we realized about half that amount, though we had as many or more blooms as we did the year before. We do not know of any way to get them into flower sooner than the natural conditions will permit, though we believe that early and constant cultivation helps some. The phlox are not so valuable on account of the bad habit they have of dropping their florets. Still when weather conditions are in their favor, they make some grand heads of bloom that help out the store window nicely. Now I have not tried to cover the whole list of desirable summer flowers in this paper, or give directions for the culture except in a general way in some instances. If some of you have summer flowers that you like better than the sorts I have mentioned I would be glad to know of them, and assure you that I am as ready to receive, as to give instruction, at all times.

DISCUSSION.

Mr. Harrison: You did not mention the iris, I wonder why you overlooked those?

A. We do not handle those, and I just mentioned those that we grow.

Q. Well, there is nothing better for Decoration day.

Mr. Williams: Iris do not ship well.

Mr. Harrison: No sir, they do not.

Mr. Williams: In the summer time the florist is called upon for flowers for funeral purposes and we must grow just certain stuff that we

know will carry and arrive at its destination and look half decent when it gets there.

Mr. Harrison: Now you take the Siberian iris, and especially the blue and take them just as they are unfolding those big blue buds, and they will keep just as well as any flower, and there is another one called the Snow Queen that is a good shipper.

A Member: What method do you use in propagating your hardy phlox?

A. We do not propagate a great many, but you can take the young growth after it has started, and it roots very readily in the greenhouse in the regular propagating bed, or we have a bench that we take up in the fall.

Q. Well, the point is, to leave them dormant for a while before you bring them to the greenhouse?

A. Well, we do that for convenience. We do not want the plants until spring, and the florist has to figure on his bench space. And we do not want to take care of them all winter. We do not propagate anything until we get it ready for the market.

Mr. Harrison: One way, and a very good way to propagate phlox is this: You take them in the fall and keep them fine and fibrous. In digging run your spade down about half way and run under and leave a lot of roots in the ground, and you will have,—sometimes you will get 25 or 30 plants from those roots. They will come up and hunt a head and find it. And they won't bloom much the first year, but you can dig them up and transplant them, and the year after you will have a fine lot. We propagate thousands of them that way. For the ordinary grower, that is the most efficient way. And another thing, you can dig up a good lot of roots, vigorous and full of life, and take them in a little pot and put them in your greenhouse and even out under a screen or in a hotbed those will grow just as readily and I think a little more so, than from cutting.

A Member: Probably one of the best ways to propagate the hardy phlox I think is to dig them up entirely and cut the good firm live roots up into about a two-inch length, and put them in a flat, and cover them with two inches of sand, keeping them at about 40 degrees, and they will very soon commence to grow and every one of them will grow just as easy as from sowing the seeds. You will have any amount of them next spring.

The Chairman: Our next paper, and last one, is by Lewis Henderson, of Omaha, on the subject of "Heating of Greenhouses."

HEATING GREENHOUSES.

Lewis Henderson, Omaha.

Mr. Henderson: Mr. President, and fellow members of the State Florists' Society: The subject of heating greenhouses is not an easy subject to do justice to in a short article. But to be in the florist business

it seems to be a necessity to be able to understand steam heating because thereupon depends part of the success of growing flowers, as there are only three months of the year in which we need no steam heat.

My first experience in heating greenhouses extends back some twenty-five or thirty years ago, when the florist business was in its infancy, when most of us were short of money and had to get along as cheap as possible. In those days as you will well remember, we used brick flues extending from one end of the greenhouse to the other, with a fireplace in the lower end and some kind of a chimney in the other. These flues kept the house fairly warm and everything seemed to thrive as long as these flues did not crack and let the gas into the houses, which they often did.

The next improvement we had was putting water pipes with heating coils placed into these fireplaces in addition to the flues which worked fairly well when put in right. After that came the hot water boiler, which of course, is a good thing for the growing of store plants and other plants, but to grow roses it is not as good on account of the sudden changes in our climate, it not being able to heat as quick as steam.

We therefore had to install the steam boiler with the gravity system by digging a deep hole in the ground in order to place the top water line of the boiler about two feet below the heating pipes to get the condensed water to return to the boiler. This has now been improved upon by the use of steam traps which lift the water into the boilers by their own pressure even if the boiler stands on the top of the ground and above the heating pipes.

The size of the boiler ought to be about one hundred horsepower to every twenty-five thousand square feet of glass or two boilers of one hundred horsepower each to fifty thousand feet of glass. I would use regular tubular iron boilers with four-inch flues with the smokestack in the front. A seventy-five foot stack with thirty-inch diameter, to a hundred horsepower boiler, or if for two or three boilers the stack must be in proportion. There is a great saving in fuel if you have a high smokestack, you get more heat out of your coal from a seventy-five foot stack than you get out of a fifty-foot stack.

The grate ought to be a close shaker grate, about half an inch opening, although of course it would depend some on the kind of coal you are using. The main feed pipes out from the boiler ought to be a four-inch to the hundred horsepower, and the return three-inch. The main feed ought to be extended overhead with an asbestos covering to the upper end of the house or from the middle to each end; this pipe can be reduced to a little smaller at each branch from the four-inch, thus making the steam return back to the starting point, the size of the heating pipes. I would use inch and a quarter black pipe about ten lengths to every twenty feet width of pipes, laying under each bench with a little slope to the boiler for carnations. For some other plants you will not need so many pipes.

There are two systems of heating: High and low pressure. On the

low pressure system you have the same pressure on the boiler as you have on the pipes in the houses, five, ten or fifteen pounds, which is about the average pressure on the pipes, either high or low pressure used.

To use the high pressure you must put in a reducing valve on the main feed pipe whereby you can carry forty to fifty pounds or more on the boiler, then set the valve to the number of pounds you desire in the houses. Of course, under the high pressure system you must have a trap system, in connection to return the condensed water. The high pressure system is greatly recommended as a saving in heating; it heats the steam to a greater degree of heat, and thus when it gets into the pipes it is more hot air and not as much water, as in the low pressure.

The amount of coal it takes, I find on an average, on a range of houses, of roses, carnation house plant, and down to violet, say fifty thousand feet, is 175 tons per month at a cost of about \$500.00 or three and a half tons of coal to every thousand feet of glass, at a cost of \$10.00 per thousand feet of glass, or \$1.00 per hundred, or one cent per foot, per month. I am basing these prices on Cherokee steam coal at an average cost of \$3.00 per ton.

The fireman is the man that can save your firm 50 to 100 per cent on the price of heating if he understands his business. He is the man who can give you the mildew on your roses or a lot of other things, if he does not keep the temperature at an even point, or goes to sleep and lets you freeze out.

If he understands his business in keeping the boilers clean with a good boiler compound and well washed out, keeps his grates clean, free from clinkers, and always a fine bright fire, if he is a man that tries to see how much heat he can get out of the least amount of coal, and not a man that tries to see how much coal he can burn during the night, he is a man that will be invaluable to you.

When you are through firing in the spring, and shut up your boilers put in some good boiler compound and fill up your boilers with water and they will keep a great deal longer than if you empty them and let the air get into them, which will rust them a great deal quicker than the water will. Then early in the fall clean them out thoroughly, inspect them good with a hammer test, and go over the brick work, and they will then be ready for another seven to nine months' service.

There are many other things connected with the heating system that I did not mention such as a temperature man, who ought to be an expert florist to look after the proper heat, and ventilation at night. Also the smoke consumers, combustion chambers, fans, or artificial drafts, which my limited time does not permit me to go into detail about, will force me to leave those things with you for discussion.

DISCUSSION.

Mr. Williams: I realize that our time is getting short, but there is a paper that I have been trying to have some one present for several years, and I am the one that suggested that paper being read at this meeting. I

would like to state that the heating plant is not given the attention it should have, by the florist. He will go and water his plants when they are dry; he will open up his ventilators, and he is always trying some new plants or flowers, and thinking that by that he is attending to his business, and keeping up-to-date. When fall comes he begins to think about the firing, and that as a general rule is the last minute, and he finds there are two or three things to be done, and the first thing you know the cold weather is here, and he goes around and tries to get the cheapest man he can get to throw his coal in this winter. Nine florists out of ten do that. There are a few of the progressive ones do not do that. I am one of the guilty ones and I have done it to my sorrow. I believe that a cheap man is expensive at any price for a night fireman.

There are several propositions that Mr. Henderson did not enter into upon his paper, that I would like to have threshed out but as I say, the time is short, and I will let it go. But as I say, there is not a florist that gives the attention that he should to his heating plant, and there is no one that burns as much coal as the florist does.

Q. What sort of a compound do you use for your boiler?

A. I have been using the liquid compound, and I think it is better than a dry compound.

Q. Do you remember the ingredients in that compound?

A. I do not, it is manufactured in Omaha.

Q. How often do you use it?

A. I put it in once a week, and I put in about half a gallon at a time in the boiler, and it does the work, and makes a whole lot of difference in the fire or firing of the boiler, of course you must wash it out. The way you draw the water out of the boiler is some every week,—empty the boiler thoroughly once a month, and draw out a little every once in a while that settles to the bottom.

Q. In case of a hot water system, is this compound good to use?

A. I do not know; I do not know anything about a hot water system.

Mr. Williams: A boiler compound is good for any boiler.

Q. Where do you drain your boiler, above or below the boiler room?

A. I generally have the boiler connected with the sewer and return pipes come right from the back end of the boilers and flow into the sewer, at the lowest point of the sewer. You must have your opening on the bottom of the boiler so that you can get that scale off.

Q. Well, we haven't a sewerage connection.

A. You don't need a sewerage. You can blow it wherever you want to. It is not necessary to blow it all off, just blow it until the water gets clear and we blow ours out into the yard. Let it blow until the water has gone down about two inches and you will get about all of the settlings out of your boiler.

A Member: There is a bill going to be presented before the legislature this winter for an appropriation of \$100,000 for a new building at the State Fair grounds for horticulture and agriculture, etc., and I move that

this society go on record as in favor of that appropriation, coming from the florists of the state of Nebraska, as an auxiliary of the Horticultural Society, and that the president and secretary of the same see that it is presented to both houses.

Seconded and carried.

The Chairman: I believe that this society is in favor of this motion, as a whole.

A Member: Well, there should be a record of it.

Mr. Williams: The president and secretary should send suitable resolutions endorsing that bill that is to be presented to the legislature.

Carried.

The Chairman: I believe this brings our meeting to a close.

Mr. Henderson: I want to get the names and addresses of all the different florists and get them enrolled upon my list so that I can send them a notice of what is going on here. Of course you should be members of the State Horticultural Society, but you can be members of this florists' society without being members of anything else. I would like to get all the different members' names down, in order to have a complete list. And remember that the dues are 50 cents a year. Not very much, but it will pay some expenses.

It now being 12 o'clock m., January 22, 1913, the meeting of the florists' session of the State Horticultural Association adjourned.

2:00 o'clock p.m., January 22, 1913.

The meeting of the Nebraska State Horticultural Society convened pursuant to adjournment, and the following proceedings were had and done.

The Chairman: We will commence where we should have commenced at 11 o'clock this forenoon. Our florist friends had a very large and interesting meeting and we did not feel like interrupting it, but let them carry their work through. The first thing in order will be the report of the secretary.

SECRETARY'S REPORT.

1912.

The Nebraska State Horticultural Society,

In account with C. G. Marshall, Secretary.

Cash received and turned to treasurer:

Membership fees.....	\$ 103 50
Advertising in Nebraska Horticulture.....	168 36
Fruit sold at State Fair.....	55 00
From State Board of Agriculture.....	1,200 00
Total	<u>\$1,526 86</u>

WARRANTS DRAWN.

No.	To Whom Drawn, and for What Purpose	Amount
1	L. Henderson, premiums.....	\$ 21 00
2	L. Henderson, per diem.....	6 00
3	C. H. Green, premiums.....	27 00
4	G. A. Marshall, per diem.....	15 00
5	W. A. Harrison, per diem.....	12 00
6	J. A. Yager, per diem	12 00
7	Ray W. Hesseltine, premiums.....	10 00
8	Marshall Bros., premiums.....	52 00
9	F. Hoffman, premiums.....	19 00
10	F. Hoffman, premiums.....	3 00
11	G. S. Christy, premiums.....	20 00
12	L. W. Slayton, premiums.....	13 00
13	Edward Nonnamaker, premiums	2 00
14	Howard & Lee, premiums.....	2 00
15	R. A. Burns, premiums.....	1 00
16	Davidson Floral Co., premiums.....	5 00
17	Dole Floral Co., premiums.....	4 00
18	Simanton & Pence, premiums.....	3 00
19	A. J. Brown, per diem.....	12 00
20	Ray W. Hesseltine, box of apples.....	2 00
21	L. M. Russell, per diem.....	9 00
22	Ira Soucey, packing, demonstrating, etc.....	25 00
23	A. C. Miller, labor at fruit show.....	12 00
24	Keyser & Marshall, premiums.....	14 00
25	Keyser & Marshall, fruit and packages.....	27 50
26	C. G. Marshall, postage, exp., del. expenses.....	39 71
27	W. M. Benton, printing.....	20 50
28	Lincoln Paper Co., paper.....	3 20
29	State Journal Co., half-tone and advertising.....	5 50
30	Sartor Jewelry Co., polishing trophies.....	1 50
31	Star Publishing Co., advertising.....	3 00
32	Wallace Hale, labor	3 00
33	Hebbard-Showers, photos	4 50
34	C. G. Marshall, January salary.....	83 00
35	Globe Delivery Co., freight and drayage.....	1 90
36	C. H. Barnard, per diem.....	9 00
37	Lincoln Tel. & Tel. Co., telephone tolls.....	85
38	Val Keyser, lecturing at horticultural institutes.....	30 00
39	C. A. Emery, reporting annual meeting.....	90 00
40	C. G. Marshall, February salary.....	84 00
41	A. J. Brown, per diem.....	6 00
42	L. M. Russell, per diem.....	3 00
43	Peter Youngers, per diem.....	6 00
44	W. A. Harrison, per diem.....	6 00

No.	To Whom Drawn, and for What Purpose	Amount
45	J. A. Yager, per diem	6 00
46	L. Henderson, per diem.....	8 00
47	C. G. Marshall, postage and express.....	13 18
48	State Journal Co., half-tones.....	6 75
49	W. M. Benton, printing.....	3 00
50	Adams Express Co., express.....	1 22
51	Roy E. Marshall, assistant secretary.....	4 00
52	Beatrice Creamery Co., storage of fruit.....	26 95
53	Clafin Printing Co., printing.....	61 00
54	State Board of Agriculture, freight on the reports sent out	66 30
55	C. G. Marshall, March salary.....	83 00
56	C. G. Marshall, April salary.....	83 00
57	Clafin Printing Co., printing.....	58 00
58	C. G. Marshall, May salary.....	84 00
59	J. R. Duncan, per diem.....	6 00
60	W. A. Harrison, per diem.....	6 00
61	C. H. Barnard, per diem.....	6 00
62	A. J. Brown, per diem.....	6 00
63	L. Henderson, per diem.....	6 00
64	L. M. Russell, per diem.....	3 00
65	Peter Youngers, per diem.....	6 00
66	C. G. Marshall, postage, express, etc.....	71 63
67	Big Four Transfer Co., drayage.....	11 25
68	Lincoln Paper Co., envelopes.....	8 21
69	State Journal Co., engraving.....	8 99
70	National Box Co., apple boxes.....	1 80
71	C. G. Marshall, June salary.....	83 00
72	Clafin Printing Co., printing.....	42 17
73	C. G. Marshall, July salary.....	83 00
74	J. A. Yager, per diem, June board meeting	6 00
75	L. Henderson, per diem.....	6 00
76	A. J. Brown, per diem.....	6 00
77	L. M. Russell, per diem.....	3 00
78	C. H. Barnard, per diem.....	6 00
79	Peter Youngers, per diem.....	6 00
80	J. R. Duncan, per diem.....	6 00
81	J. A. Yager, per diem	6 00
82	C. G. Marshall, postage, express, etc.....	18 88
83	W. M. Benton, printing.....	8 50
84	C. H. Green, premiums.....	78 00
85	Frey & Frey, premiums.....	127 00
86	L. Henderson, premiums.....	164 00
87	Ed Williams, premiums.....	129 00
88	Frey & Frey, premiums.....	10 00
89	J. D. Wilson, judging.....	15 00

No.	To Whom Drawn, and for What Purpose	Amount
89½	C. G. Marshall, August salary.....	84 00
90	C. H. Green, premiums.....	5 00
91	Roy Alder, premiums.....	2 00
92	J. E. Atkinson, premiums.....	10 00
93	C. H. Barnard, premiums.....	137 50
94	G. F. Beavers, premiums.....	10 00
95	Chas. B. Camp, premiums.....	56 00
96	G. S. Christy, premiums.....	37 00
97	R. T. Chambers, premiums.....	22 00
98	Geo. R. Chatburn, premiums.....	2 00
99	J. R. Duncan, premiums.....	23 00
100	J. R. Davidson, premiums.....	15 00
101	R. B. Duncan, premiums.....	3 00
102	Geo. McGraw, premiums.....	2 00
103	Mrs. F. G. Everetts, premiums.....	1 00
104	C. E. French, premiums.....	2 00
105	John Furnas, premiums.....	4 50
106	Gr. View Orchard & Vineyard Co., premiums.....	14 00
107	Henry Gillian, premiums.....	1 00
108	Ray W. Hesseltine, premiums.....	77 50
109	Harrison Nursery Co., premiums.....	2 00
110	J. R. Huffman, premiums.....	17 00
111	I. J. Holland, premiums.....	1 00
112	Alex. James, premiums.....	2 00
113	Keyser & Marshall, premium.....	58 00
114	Theo. Kaar, premiums.....	1 00
115	Fred Kinker, premiums.....	2 00
116	Wm. Koopman, premiums.....	2 00
117	Z. T. Leftwich, premiums.....	50
118	Marshall Bros., premiums.....	167 00
119	Arnold Martin, premiums.....	11 00
120	O. McNutt, premiums.....	2 50
121	Jesse McCoy, premiums.....	1 00
122	Ed. Newell, premiums.....	1 00
123	Mrs. Mary Nodolf, premiums.....	1 00
123½	Frank Philleo, premiums.....	1 00
124	Tom Pohlman, premiums.....	1 50
125	Peru Fruit Farm, premiums.....	34 00
126	G. L. Rolofson, premiums.....	2 00
127	Wm. Rosencrans, premiums.....	1 00
128	W. Sebering, premiums.....	3 00
129	Wm. Shannon, premiums.....	1 00
130	W. F. Sidders, premiums.....	19 00
131	Velvick & Whittaker, premiums.....	23 00
132	Fred Wheeldon, premiums.....	18 00
133	Frank Williams, premiums.....	32 50

No.	To Whom Drawn, and for What Purpose	Amount
134	W. H. Wetenkamp, premiums.....	1 00
135	A. H. Wetenkamp, premiums.....	1 00
136	C. H. Barnard, per diem.....	30 00
137	J. A. Yager, per diem	24 00
138	L. Henderson, per diem.....	21 00
139	A. J. Brown, per diem.....	27 00
140	L. M. Russell, per diem.....	24 00
141	G. A. Marshall, per diem.....	18 00
142	Ray Hesseltine, per diem.....	12 00
143	W. A. Harrison, per diem.....	12 00
144	J. R. Duncan, per diem.....	24 00
145	E. B. Brown, labor.....	2 50
146	Jennie Edward, labor	7 50
147	Roy E. Marshall, clerk	17 50
148	F. W. Bechtel, labor	1 00
149	M. M. Youngers, labor	1 00
150	A. B. Cooper	10 00
151	A. B. Cooper, demonstrating, state fair.....	57 85
152	W. J. Blystone, labor and expenses.....	72 15
153	Chas. Haney, labor	20 00
154	W. M. Benton, printing	19 75
155	Beatrice Creamery, fruit storage.....	28 87
156	L. Henderson, per diem.....	6 00
157	A. J. Brown, per diem.....	6 00
158	J. R. Duncan, per diem.....	6 00
159	Peter Youngers, per diem.....	6 00
160	W. A. Harrison, per diem.....	6 00
161	G. A. Marshall, per diem.....	6 00
162	Baker Bros. Engraving Co., engraving.....	3 00
163	Frey & Frey, wild smilax	20 65
164	Wilber D. Camp, signs	7 00
165	Western Supply Co., plumbing supplies.....	1 75
166	Hotel Victoria, room rent for A. B. Cooper.....	7 50
167	Peter Youngers, apples	3 90
168	Rudge & Guenzel, supplies	11 54
169	Lincoln Paper Co., paper and paper plates.....	12 13
170	State Journal Co., engraving and printing.....	15 00
171	C. H. Barnard, fruit used at fair.....	39 00
172	C. H. Barnard, per diem.....	9 00
173	Lincoln Tent & Awning Co., rental tent.....	3 00
174	C. G. Marshall, postage and fruit.....	8 29
175	Lincoln Tel. Co., phone rent	6 00
176	C. G. Marshall, September salary.....	83 00
177	J. A. Yager, per diem	6 00
178	Peter Youngers, freight on fruit.....	1 90

No.	To Whom Drawn, and for What Purpose	Amount
179	C. G. Marshall, October salary.....	83 00
180	Claflin Printing Co., printing.....	63 75
181	A. J. Brown, per diem.....	6 00
182	L. Henderson, per diem.....	6 00
183	Peter Youngers, per diem	6 00
184	C. H. Barnard, per diem.....	6 00
185	L. M. Russell, per diem.....	3 00
186	J. A. Yager, per diem	6 00
187	C. G. Marshall, postage, etc.....	33 97
188	J. R. Duncan, per diem.....	6 00
189	Beatrice Creamery Co., ice used at state fair.....	19 00
190	C. G. Marshall, November salary.....	84 00
191	C. G. Marshall, December salary.....	83 00
192	State Board of Agriculture, freight on reports sent out....	24 73
Total warrants drawn.....		\$4,226 63

The Chairman: In this connection, we will also listen to the treasurer's report.

TREASURER'S REPORT.

1912.

The Nebraska State Horticultural Society,

In account with Peter Youngers, Treasurer:

1912

Jan. 16th.	Balance on hand	\$2,284 19
June 1st.	Received, C. G. Marshall.....	168 36
June 1st.	Received, C. G. Marshall.....	103 50
June 1st.	State appropriation	1,500 00
Sept. 7th.	Appropriation C. G. Marshall.....	55 00
Sept. 7th.	Appropriation State Agricultural Society.....	1,200 00
Sept. 2st.	Appropriation State Appropriation.....	1,000 00
Total cash received		\$6,311 05
Total warrants paid		\$4,146 40
Balance on hand Jan. 21st, 1913		\$2,164 65

WARRANTS PAID.

Series 1911

No.	Name	Amount
157	W. E. Shannon	2 00
168	L. Smith	1 00
132	E. M. Butterfield	1 00

Series 1912

No:	Name	Amount
1	Louis Henderson	21 00
2	Louis Henderson	6 00
3	C. H. Green	27 00
4	G. A. Marshall	15 00
5	W. A. Harrison	12 00
6	J. A. Yager	12 00
7	Ray W. Hesselstine	10 00
8	Marshall Bros	52 00
9	F. Hofman	19 00
10	W. Hofman	3 00
11	G. S. Christy	20 00
12	L. W. Slayton	13 00
13	Edward Nonnamaker	2 00
14	Howard & Lee	2 00
15	R. A. Burns	1 00
16	Davison Floral Co.	5 00
17	Dole Floral Co.	4 60
18	Simanton & Pence	3 00
19	A. J. Brown.....	12 00
20	Ray W. Hesselstine.....	2 00
21	L. M. Russell	9 00
22	Ira Soucey	25 00
23	A. C. Miller	12 00
24	Keyser & Marshall	14 00
25	Keyser & Marshall	27 50
26	C. G. Marshall	39 71
27	W. M. Benton	20 50
28	Lincoln Paper Co.	3 20
29	Nebraska State Journal	5 50
30	Sartor Jewelry Co.	1 50
31	Star Publishing Co.	3 00
32	Wallace Hale	3 00
33	Herbert Showers	4 50
34	C. G. Marshall	83 90
35	Globe Delivery Co.	1 90
36	C. H. Barnard	9 00
37	Lincoln Telephone & Tel Co.....	85
38	Val Keyser	30 00
39	C. A. Emery	90 00
40	C. G. Marshall	84 00
41	A. J. Brown.....	6 00
42	L. M. Russell	3 00
43	Peter Youngers	6 00
44	W. A. Harrison	6 00

No.	Name	Amount
45	J. A. Yager	6 00
46	L. Henderson	6 00
47	C. G. Marshall	13 18
48	State Journal Co.	6 75
49	W. M. Benton	3 00
50	Adams Express Co.	1 22
51	Roy E. Marshall	4 00
52	Beatrice Creamery Co.	26 95
53	The Claflin Printing Co.	61 00
54	Nebraska State Board of Agriculture.....	66 30
55	C. G. Marshall	83 00
56	C. G. Marshall	83 00
57	Claflin Printing Co.	58 00
58	C. G. Marshall	84 00
59	J. R. Duncan	6 00
60	W. A. Harrison	6 00
61	C. H. Barnard	6 00
62	A. J. Brown.....	6 00
63	L. Henderson	6 00
64	L. M. Russell.....	3 00
65	Peter Youngers	6 00
66	C. G. Marshall	71 63
67	Big Four Transfer Co.....	11 25
68	Lincoln Paper Co.	8 21
69	State Journal Co.....	8 90
70	National Box Co.	1 80
71	C. G. Marshall	83 00
72	Claflin Printing Co.	42 17
73	C. G. Marshall	83 00
74	J. A. Yager	6 00
75	Louis Henderson	6 00
76	A. J. Brown	6 00
77	L. M. Russell	3 00
78	C. H. Barnard	6 00
79	Peter Youngers	6 00
80	J. R. Duncan	6 00
81	J. A. Yager	6 00
82	C. G. Marshall	18 88
83	W. M. Benton	8 50
84	C. H. Green	78 00
85	Frey & Frey	127 00
86	L. Henderson	164 00
87	Ed Williams	129 00
88	Frey & Frey	10 00
89	J. S. Wilson	15 00

No.	Name	Amount
89½	C. G. Marshall	84 00
90	C. H. Green	5 00
91	Roy Alder	2 00
92	J. E. Atkinson	10 00
93	C. H. Barnard	137 50
94	C. F. Beavers	10 00
95	Chas. B. Camp	56 00
96	G. S. Christy	37 00
97	R. T. Chambers	22 00
98	Geo. R. Chatburn	2 00
99	J. R. Duncan	23 00
100	J. R. Davidson	15 00
101	R. B. Duncan	3 00
102	Geo. Degraw	2 00
103	Mrs. F. G. Everett.....	1 00
104	C. E. French	2 00
106	Grand View Orchard & Vine Co.....	14 00
108	Ray W Hessel tine	77 50
109	Harrison Nursery Co.	2 00
110	J. R. Huffman	17 00
111	I. J. Holland.....	1 00
112	Alex Jaynes	2 00
113	Keyser & Marshall.....	58 00
114	Thos. Kaar	1 00
115	Fred Kunker	2 00
116	Wm. Kookman	2 00
118	Marshall Bros.	167 00
119	Arnold Martin	11 00
120	O. McNutt	2 50
121	Jesse McCoy	1 00
122	Ed Newell	1 00
123	Mrs. Mary Nodolf	1 00
123½	Frank Philleo	1 00
126	G. L. Rolofson	2 00
127	Wm. Rosencrans	1 00
128	Wm. Sebring	3 00
129	W. Shannon	1 00
130	W. F. Sidders	19 00
131	Velvick & Whitaker.....	23 00
133	Frank Williams	32 50
134	W. H. Wetenkamp	1 00
135	A. H. Wetenkamp.....	1 00
136	C. H. Barnard	30 00
137	J. A. Yager	24 00
138	L. Henderson	21 00

No.	Name	Amount
139	A. J. Brown	27 00
140	L. M. Russell.....	24 00
141	G. A. Marshall	18 00
142	Ray W. Hesseltine	12 00
143	W. A. Harrison	12 00
144	J. R. Duncan	24 00
145	E. B. Brown	2 50
146	Jennie Edwards	7 50
147	Roy E. Marshall	17 50
148	F. W. Bechtel	1 00
149	M. M. Youngers	1 00
150	A. B. Cooper	10 00
151	A. B. Cooper	57 85
152	W. J. Blystone.....	72 15
153	Chas. Haincy	20 00
154	W. M. Benton	19 75
155	Beatrice Creamery Co.	28 87
156	Louis Henderson	6 00
157	A. J. Brown	6 00
158	J. R. Duncan.....	6 00
159	Peter Youngers	6 00
160	W. A. Harrison	6 00
161	G. A. Marshall	6 00
162	Baker Bros. Engraving Co.	3 00
163	Frey & Frey	20 65
164	Willer D. Camp	7 00
165	Western Supply Co.	1 75
166	Hotel Victoria	7 50
167	Peter Youngers	3 90
168	Rudge & Guenzel Co.	11 54
169	Lincoln Paper Co.	12 13
170	State Journal Co.	15 00
171	C. H. Barnard	39 00
172	C. H. Barnard	9 00
173	Lincoln Tent & Awning Co.....	3 00
174	C. G. Marshall	8 29
175	Lincoln Telephone Co.	6 00
176	C. G. Marshall	83 00
177	J. A. Yager	6 00
178	Peter Youngers	1 90
179	C. G. Marshall	83 00
180	Claffin Printing Co.....	63 75
181	A. J. Brown	6 00
182	Louis Henderson	6 00
183	Peter Youngers	6 00

No.	Name	Amount
184	C. H. Barnard	6 00
185	L. M. Russell	3 00
186	J. A. Yeager	6 00
187	C. G. Marshall	33 97
188	J. R. Duncan	6 00
189	Beatrice Creamery Co.	19 00
190	C. G. Marshall	84 00
191	C. G. Marshall	83 00
Total warrants paid		\$4,146 40

Lincoln, Neb., Sept. 21, 1912.

This is to certify that I have this day received from Peter Youngers, treasurer of the Nebraska State Horticultural Society, the following list of warrants in exchange for state warrant No. D20116 in the sum of \$1,000.

84	C. H. Green.....	\$ 78 00
85	Frey & Frey	127 00
86	L. Henderson	164 00
87	Ed Williams	129 00
90	C. H. Green	5 00
93	C. H. Barnard	137 50
95	Chas. B. Camp	56 00
108	Ray W. Hesselstine	77 50
113	Keyser & Marshall	58 00
118	Marshall Bros.,	167 00
135	A. H. Wetenkamp	1 00
		\$1,000 00

Witness my hand and seal this 21st day of September, 1912.

J. W. SHAHAN,
Deputy Auditor Public Accounts.

The Chairman: If there is no objection, this report will be referred to the finance committee, and I will announce that committee.

The committee was announced as follows: Mr. Yager, chairman, Mr. E. H. Smith of York, Mr. Ernest Pollard of Nehawka.

AUDITING COMMITTEE'S REPORT.

Mr. Chairman: We, the committee appointed to examine the report of the secretary and treasurer of this society, find the same to be satisfactory and correct.

J. A. YAGER,
E. H. SMITH,
E. M. POLLARD.

Accepted.

Mr. Youngers: I have received a letter from our old friend, Mr. W. J. Hesser, and if you will allow me, I will read it.

(Permission granted, and Mr. Youngers read the letter).

Pasadena, Cal., Jan. 12, 1913.

Mr. P. Youngers, Geneva, Nebr.

Dear Sir and Friend: Next week you will be in Lincoln at the horticultural meeting. How I would love to be with you, but can not. I enclose photo of self and all of the children and grandchildren that are in California. They were all home to take dinner with me the Sunday before my seventy-eighth birthday anniversary. I assure you it was a happy day.

Tell all that Hesser is real well, stout and about the happiest man in California. Am about twenty years younger in strength and activity than when I left Nebraska. I now work from daylight to dark, soon the days will be longer, so I can work 12 to 15 hours each day, then I will have a grand good time with the dear plants and in my garden.

For the last week we have had a very great change in the weather. One whole week of cold, frosty weather. Some nights the ground froze near three inches and ice most one inch thick. The citrus fruit is badly injured and many tender plants killed to the ground or most so. The orchard trees are not badly injured. Just how much the fruit is hurt we can not tell at this time, but we will have lots of it to ship. Had a big white frost this morning, but bright today. We need rain badly. Had a very light one last week, but need lots more. I lost quite a few of my plants in the lath house and what I had outside in the little nursery, but still have some left and will make plenty more soon. Still have plenty to eat and wear, so why not be happy? Kindly remember me to all of the boys and tell them when they come to California to be sure to hunt me up and have a good visit.

With kind regards,

Very truly yours,

W. J. HESSER.

Mr. Yager: I suggest that our secretary be requested to write a letter of congratulation to this old friend of ours, and tell him that we wish him success and give him our best wishes.

Mr. Green: I want to second that motion, because I came to Lincoln at Mr. Hesser's suggestion.

The Chairman: I suggest that somebody amend that motion, to make it a night letter tonight. Seconded. Carried.

ELECTION OF OFFICERS.

The Chairman: The time has now arrived for our annual election of officers, and unless there is further business that should be brought before this meeting, we will proceed with that order. I do not suppose that any motion is necessary, so I will appoint as tellers Mr. Green of Fre-

mont and Mr. Titus of Nemaha. The first office to be filled is that of president. I think it has been the custom here to make nominations, and then vote by ballot.

Mr. G. A. Marshall: We have made it a rule lately that the president only serves one term. If it was not for that rule, I think we would impose another year on the present incumbent. But that being the case, I want to place in nomination an old member of this society, one who has not had that honor yet, or the burden; and feeling that we have a couple of years of hard work ahead of us right now,—we are starting into it, and we cannot back out,—and not one of us wants to back out,—we feel that it is well enough to place a man in nomination who is willing and capable to take the burdens of the association upon his shoulders and carry them through without faltering, and I place in nomination the name of C. H. Barnard.

The Chairman: Are there any further nominations.

No further nominations.

Mr. Marshall: I move you that we suspend the rules, and instruct the secretary to elect Mr. Barnard by acclamation.

Seconded. Carried.

The Chairman: Gentlemen, the secretary casts the unanimous vote of this association for Mr. Barnard for the president of this society, for the ensuing year. The next in order is the election of a first vice-president.

Mr. Williams: Mr. Chairman, and members of this society: I wish to place in nomination a man who has been second vice-president for two terms. He is in the floral end of this society, and I believe that the showing of that department in this society demands recognition, and therefore I place in nomination the name of Louis Henderson of Omaha.

Mr. Smith: I wish to place in nomination the name of J. A. Yager of Fremont for this office.

Vote taken by ballot. Votes counted and Mr. Yager declared elected.

Mr. Henderson: I wish to withdraw my candidacy and make this election unanimous, and move that Mr. Yager be made the unanimous choice of this society.

Seconded. Carried.

Mr. Christy: Mr. President, I believe for second vice-president it would be well to make the poet laureate, Louis Henderson, the nominee for that office.

Member: I move that the rules be suspended and the secretary be instructed to cast the unanimous vote of this society for Mr. Louis Henderson for second vice-president.

Seconded. Carried.

The Chairman: The next office to fill is that of treasurer, and we are ready for nominations.

Mr. Green: In accordance with the ancient rules and landmarks of this society, I move you that the rules be suspended and Peter Youngers

be declared elected treasurer of this society for this ensuing year, for, I think, the twenty-third or twenty-fourth time.

Seconded. Carried.

The Chairman: We have also a director to elect, Mr. Yager being advanced to the vice-presidency and his term of office having closed.

Mr. Henderson: The florists' society has only one representative on the board, while the others have all the rest. I think we should have two representatives on the board, and we will try to do all we can for it as we have in the past, and therefore I would like to have another florist on the board. One florist gets pretty lonesome and he should have another fellow with him, to help him out once in a while, and that would be only fair play to the rest of the members, and therefore I have great pleasure in nominating Mr. Ed Williams of Grand Island.

A Member: As the apple industry is one of the leading industries of the state of Nebraska, and as we want a good, live man to help push this movement along, I nominate Mr. Harrison of York.

No further nominations. Vote taken by ballot. Ballots counted. Mr. Harrison of York receives 31 votes, and Mr. Williams of Grand Island 11.

The Chairman: I therefore declare Mr. Harrison of York elected as director for the next three years. This, I believe, ends the election of officers.

OTHER BUSINESS.

The Secretary: The Horticultural Society last year started to hold horticultural institutes in different parts of the state. We are now arranging for a series to be held the week of the 17th of February. We are starting up about Florence or Blair, and coming down the river, and then we have arranged to come to Nebraska City and Peru and Brownville and Shubert. If we are going to hold those institutes we want the members that live near those places to get busy and help work up interest for these meetings. It is pretty hard to do all the work from this end, and we would be very glad for you people that live there to co-operate with us. At Brownville and Peru and Florence the local organizations will co-operate with us.

Mr. Henderson: I make a motion that the president appoint a committee to revise the premium list. A committee of three, or whatever is customary.

The Chairman: Three would be plenty, I think.

Seconded.

A Member: I would like to ask if it has not been customary, and if not, why not, for this matter to be referred to the Board of Directors? Let them take up this work. It is quite a job and the directors are paid for their work and let them do it. The usual course has been that this committee reports to the Board of Directors and the board makes the necessary revision. The revision must of necessity be made by the board. It could not be done in the whole society, because it would take too much time. The board revises the work of the committee. It must be gone over a second time, section by section and item by item, and either

accepted or rejected by the board. That has been the usual custom. And this committee has its appointed representative, appointed with the understanding, and they report to the board, and that report must be made not later than the meeting of the board on June 1st, at which time the board checks up the secretary.

The Chairman: You have heard the motion for a committee on the revision of the premium list. All in favor say aye.

Carried.

The Chairman: I will announce the committee later.

Mr. Benz: I would like a little information in regard to the announcement that the secretary made in regard to these institutes. Are they conducted on the same line that the regular farmers' institutes are conducted?

The Secretary: Something similar. In one or two points last year, we had some demonstration work. I believe at Peru a demonstration was had in pruning, and also in packing apples. Now the main thing we thought best to take up this year in this section would be spraying, cultivating, and pruning, and possibly something along the line of organization of the fruit growers. We can not put on very many of those, because our funds are limited. You know that the eastern part of the state is developing very fast in commercial apple growing, and we want to help those people. There are a great many apple orchards down there that do not have the care they should have.

Mr. Benz: I notice that the western part of the state is not represented in this matter. I would suggest that in the farmers' institutes that a competent horticulturist be put on the work. In the farmers' institutes which we have in the western part of the state we have no representative of the horticultural society, or any tree talk of any sort. If there is any place in this state we need information and help it is in the western part of the state. I live in the North Platte valley country, in Garden county, the youngest county in the state, and a part of what was formerly Deuel; about one hundred miles from the west line of the state and about forty miles from the Colorado line. We grow some fruit there and a very few of the people know anything about it, and most of them are of the opinion that we can not grow fruit successfully in our country. Notwithstanding the fact that we have an orchard located in our county, one that is very productive, but unfortunately the orchardist is not very well informed along horticultural lines, except as he has proven out on his place. Now, we need this instruction, and if it would be possible to get a horticulturist on the board it would do a good deal of good.

Mr. Pollard: It seems to me if the gentleman would call on Professor Pugsley, who has charge of these farmers' institutes, and lay this matter before him, he might be able to give him relief. The gentleman understands no doubt that this society does not conduct any institutes except experimental work, which we started out on last year. I think all you would have to do would be to make a request of this kind.

Mr. Benz: Don't you think that it would be better for this society to go on record as favoring such a man?

A Member: My country is in the same way that this man's country is. We do not care much about the trees. They are about at bearing age now, but they do not produce. I had a promise three years ago from the experiment station that there would be a man come there and give us a talk along those lines, but he failed to do so. I have seen specimens of the trees that were affected with fungous disease, and also the fruit, and he had seen them, and acknowledged they were in bad shape and needed attention, and promised the second time to send a man there and give us a talk on that line, but we failed to have a man come there. We are just about in the same fix that this gentleman is in his country. It is in the western part of the state. I guess it is the furthest division in the fruit country.

The Chairman: We will have a committee on resolutions, and if you gentlemen will prepare a resolution that this society endorse this sort of a movement and hand it to this committee we will do something with it. We will now resume our meeting and listen to a paper by Mr. George H. VanHouton of Lenox, Iowa, on the subject of "Where and How Can We Grow Apples Successfully?"

HOW AND WHERE CAN WE GROW APPLES SUCCESSFULLY?

Geo. H. VanHouten, Lenox, Iowa.

I have no excuse to make for my absence from your meeting this morning, or from the early part this afternoon, but in order that you may not think I absented myself intentionally I will say that I was on committee work all the time up to now, and that is the reason I did not have the pleasure of being with you. I have written out what I propose to say to you for reasons that I need not explain. As a rule I do not write out what I am going to say, and do not know what I am going to say, but in this case I will have a record that I will leave with the secretary, so that you will have it, and there will be no dispute as to what I will say on this occasion.

It was with great reluctance that I accepted the invitation of your secretary, so cordially given, to participate in your meeting by presenting a paper on the above topic. I have prepared this paper with misgivings; not that there is any desire to shirk a duty or refuse a request, but from the fact that a paper along the desired lines must be prepared, in part at least, from observation rather than from actual Nebraska experience. As touching my qualifications to write on the subject, can say that I was born near the Missouri river, in sight of Nebraska, and that most of the years of my life have been spent in western Iowa and on the Missouri watershed, and that my observations in Nebraska have extended over many years; for, more than forty-seven years ago I traversed the entire state, from east to west, and have done so frequently in the years since, and that I am not a stranger to your state and its conditions, and yet can not speak as one who has had long residential experience as to methods, varieties, etc.

But in spite of this handicap, I can speak with somewhat of confidence, for your conditions here are in many respects similar to those in western Iowa, where I have resided for so long and have been so closely identified with the horticultural development of that region. Therefore, taking all these things into consideration, I could not find sufficient excuse to decline the request of your secretary.

We have come to the conclusion in western Iowa that there is no good reason why any one should go to the mountain states or the far West to engage in apple growing from a commercial standpoint, and as Nebraska, especially the eastern portion, is similar in many respects to western Iowa, I feel that experiences in our own territory will justify conclusions as to conditions in Nebraska, and especially as to the eastern part of your state.

At the annual session of the Southwestern Iowa Horticultural Society, held in Council Bluffs, December 3 to 5, 1912, we had an apple display that, for quality and appearance, could not be surpassed anywhere, and as to variety far in excess of the needs of any commercial apple grower, for we had nearly one hundred varieties, and about half of them were of such superior excellence as would attract attention anywhere. All of these apples were grown in southwestern Iowa, and every exhibitor but one was from the western part of our district. The one exception, Clayton O. Garrett, of Adelphi, and the location and names of the others were J. M. Bechtel, C. E. Mincer, of Hamburg; Miss Minnie Avery, F. Barton, J. F. Keeline, I. N. Minick, Council Bluffs; D. W. Lotspiech, Woodbine; W. R. Coy, Tabor, and C. H. Deur, Missouri Valley. So, as you can see, most of our splendid exhibit came from the hill lands bordering on the Missouri river and just across from your own state, and so you see that I can speak with confidence, although I do not have the honor of being a citizen of your state.

Your hill lands, and especially your hill lands of the Missouri slope, are so admirably suited to commercial apple growing that this part of the subject is most in mind in preparing this paper. This is not said with any thought of disparaging the growing of apples or other fruit in any other part of your state, for fruit should be grown everywhere that it is possible to grow it, for the home, and, besides, there is a much wider field for commercial fruit growing than the eastern part of your state, but I have preferred to speak more particularly of the advantages of the hill lands bordering the Missouri and extending back an indefinite distance where observation has shown that such orcharding should prove highly successful, and every home owner should raise fruit even if he does not reside in the favored locality under especial discussion.

The home owner should plant in such quantity that there will be plenty in seasons of partial failure; for the surplus can be disposed of in case there is more than needed for the home. And, of course, the home orchard should contain more varieties than the commercial orchardist can afford to plant. So we can appeal to the homemaker and the home-lover, and urge him to supply himself and family with an abundance; for he can do so so easily and so satisfactorily that he can not afford to do

otherwise; for fruit does more than almost any other one thing to make the members of the family satisfied with the home and with country life. So we appeal to the rural dweller to provide the home with the best of nature's gifts, an abundance of fruit.

It is often said that an appeal to the pocketbook is the strongest plea that can be made. While not pretending to emphasize this view from a sordid standpoint, yet the fact remains that there is no place within my knowledge that promises better returns and more certainly than commercial apple growing in the locality under discussion. Among the reasons that may be enumerated are the following:

Cheap Lands. Now please do not get excited when the present prices of land are called cheap. Of course they have been much cheaper. I remember, in the early days before you had any railroad in your state, that one day we remained near Fort Kearney, having been detained by the United States soldiers until we should have accessions to our numbers, because the Indians were hostile. While we were waiting we discussed matters in general and particularly as to the value of lands in the Platte valley. We had nearly fifty men in our wagon train, and most of us were westerners, and should have known more as to the prospective values of land than we did at that time. It was the consensus of opinion, and very well expressed by several during the discussion, that the land was not worth a cent an acre, and one man said that if he had a million dollars that he would not give a cent an acre for all of it, or any of it. Not a man of the number offered a dissenting opinion, for this was the deliberate judgment of all present. At that time those lands were considered dear at any price, and nobody wanted them, and they could have been had for the taking under the homestead law, the only expense being the small filing fee. But we now know that all these lands will raise wonderful crops, and they rank in price above the price of lands in some of the older states. We did not know then, and in fact it is only recently that we have become aware of their great value for fruit growing. When we consider the prospective value of these lands, and especially when we consider that orchard lands of the far West are selling for a thousand dollars or more per acre, we must conclude that your lands are cheap, especially when we consider their great producing power for horticultural and other valuable crops, we must conclude that they are very cheap.

Soil. When the quality of soils is considered, and that there is nothing further to be desired, and if any one was so unreasonable as to desire better, that it could nowhere be found, it gives us the idea that so far as soil is concerned there is nothing better than can be had anywhere at any price. Not only is there a great depth of the very best of soil, but in addition to this there is perfect natural drainage. As soil drainage is necessary to successful orcharding, and as the expense of tiling imperfectly drained soil is great, it will be seen that this is a highly important item and worthy of the greatest consideration.

Air Drainage. An essential of successful apple growing is air drainage, and your hill lands afford this. Even level lands afford this, provided there are lower lands in the immediate vicinity. Freedom from leaf

diseases, some believe, may be secured by spraying, but perfect air drainage, or circulation of air, conduces to health and longevity of the trees. Depressions in orchards often show effects of lack of air drainage, for trees die in such places, while the trees otherwise situated survive and thrive.

Quality of Fruit. The quality of apples grown along the Missouri river can not be surpassed anywhere, and the territory under consideration is far enough north so that we secure keeping quality that can not be had farther south. We have an established reputation for quality that is unquestioned and as the buyers of the future may be more particular as to quality than buyers are now, there is an important consideration in the selection of a location for commercial orcharding. If high quality is desired, in fact, the highest attainable quality is desired, then it would be useless to look elsewhere for a location for meeting that requirement.

Varieties. It will pay to select varieties of high quality rather than those of poor or lower quality. Where the Jonathan, Grimes Golden, and others of the best can be successfully grown, as they can be here, it is poor policy to select Ben Davis and other low-grade varieties. Varieties should be selected that are known to do well in the locality of the proposed planting, and, happily, experience of nearby planters is at hand, and it is a safe guide, due attention being paid to size, productiveness, and so forth, of the varieties that do well in the locality. For illustration, supposing the Grimes Golden and Roman Stem both do well in a given locality; then the Grimes Golden should be chosen for the apples run even in size; a much greater proportion of them will grade first class, and the fruit can be more cheaply gathered, graded, packed, and so forth, and the fruit presents a more attractive appearance and sells better than the Roman Stem. The quality of both varieties is good, and yet there is such a difference in the items above given as to generally eliminate the Roman Stem as a commercial variety, while the Grimes Golden, where it succeeds, should have a place in every orchard alongside of the Jonathan, where they both do well; and fortunately both do well in most places along the Missouri river and for a considerable distance on either side.

Accessibility to Markets. One of the very desirable conditions that presents itself to the prospective planter in this locality is the nearness to market and splendid shipping facilities. The growing cities with their splendid transportation facilities are worthy of especial consideration. Again, we are near the northern border of successful commercial apple growing, and the vast regions of the northland are to be supplied, and if you do not supply their wants and demands it is probable that they will not be supplied. It is nearly sure that in the future means of distribution will be so increased and cheapened as to enable all who desire to do so, to have fruits when fruits can be had. It is also apparent that there is a growing inclination to eat fruit, with an increasing determination of the people to have what they want, that there will be an increase in demand greater than the increase in population. Part of the present high cost of living is due to high living, and it is to be hoped that this inclination can be fostered and increased, especially in regard to eating

fruit, which is the most delightful and health-giving product that enters into the diet of our people. It is to be hoped, also, that the fruit growers of the future will plant and deal on the plan of reasonable profits; growing largely with a view of feeding the masses, and that the transportation companies will be liberal in their dealings, so that the blessings of cheap fruit may be extended to all, whether they reside in our favored portion of the realm or not; so that the vast grain country of the North may be supplied, the rich mining regions of the West as well, and the overcrowded cities of the East. And the time will come, the writer believes, when the people of the islands of the sea, and the people of the Orient as well, will gladly eat of our surplus fruit. Our habit of eating tropical fruit is well established, and why should not the people of the tropics desire and receive our fruits in return? A few years ago the citrus fruit growers of California secured a shipping rate across our continent and to Europe at as low a rate as for comparatively a short part of that distance; thus the California grower was enabled to reach a distant market and sell his product at a profit, and after the fruit-eating habit had been formed even higher prices only measurably reduced the consumption. Apple growers have never, so far as I know, even attempted to do what the citrus fruit growers succeeded in doing, as to special rates, but the time will come that all will be put on an equality, and then the apple grower will come into his own.

Encouraging Outlook. The fact that success has attended the efforts of our best planters in the past should be an encouragement for the future. We have the benefits of the experiences of the past, and there should be fewer mistakes in the selections of varieties and locations. Conditions generally have changed for the better, and the prospects are bright for the apple grower who will devote intelligent energy to the production of our best and most profitable market varieties. If he has not experience, information is at hand for the asking, and he can avoid the costly experiments and experiences of the past; for the signboards of success are numerous; for many varieties have succeeded and some of them remarkably well. And right here comes one of the dangers, at least one of the things to be avoided; and that is, too many varieties for the commercial orchard. There is a temptation to plant too many sorts and to try new varieties. Visiting a large apple grower, just as he was finishing up his pack last autumn, his complaint was that he had too many varieties, and yet he had but about six in all. According to his views but two or three of these varieties were enough for a commercial orchard. He was located away from any large center of population, but even if near a large city it is easy to get too many varieties.

Essentials of Success. In conclusion, then, in summing up the essential things necessary to success: In addition to splendid soil with good air drainage, suitable climate for the production of apples of the best quality, all of which you have to a remarkable degree, add proper preparation of the soil, discrimination and elimination in the selection of varieties, proper planting, thorough cultivation, protection from vermin, proper pruning, spraying, and care; in fact, giving proper attention to every

detail; then with careful foresight in securing pickers, packers, markets, and in fact giving every part of the transaction the same care that a successful business man gives to every detail of his business, may be summed up as the essentials of success, and if this is done there seems to me to be no better place, and that there is no better prospect of success in any business, or in any place, than in commercial fruit growing on the hill lands of the Missouri river slope.

DISCUSSION.

The Chairman: Gentlemen, this paper is open for discussion or for questioning. Any one who has any questions they would like to ask Mr. VanHouten, he is perfectly at liberty to do so. I wish to say I think it is a very fine paper.

The Chairman: We have with us a number of visiting brethren from Iowa. Quite a number of them are already honorary members of our society, and we wish those who are not, as well as those who are, to feel at perfect liberty to take part in the discussion here, and at all sessions of this meeting. We will now listen to a paper from Mr. J. P. Hess of Council Bluffs, Iowa, on the subject of "The Advisability of Fruit Growers' Associations in the Missouri River Valley."

THE ADVISABILITY OF FRUIT GROWERS' ASSOCIATIONS IN THE MISSOURI RIVER VALLEY.

J. P. Hess, Council Bluffs, Iowa.

Mr. Chairman, Ladies and Gentlemen: I have no apology to make for being here. About seventeen years ago I was invited to a horticultural meeting at Arlington, Nebraska, and my memory and remembrance of that meeting are still with me. And I feel glad that I became acquainted with such an active, boosting bunch of horticulturists as you have here in the state of Nebraska. The fact is, we are just on the border of the state, and being acquainted and becoming acquainted at that time with these people, I felt like one of you ever since.

Therefore I am happy to be here today, and if I can say a word that will be of benefit and interest to the horticulturists of Nebraska I shall be well repaid for coming. As I look down along the line from the time I became acquainted with these men, I can see there has been a decided progress made in the line of horticulture, and the demonstration across the way is evidence that the people of Nebraska have about the right class of men in this line of work, and I can only account for this great success that has been made here by the splendid work that these men have been doing, and especially by their team work—by working together and believing in what they are doing. And I believe in the near future we will see the results that we little dream of now. I believe that the state of Nebraska, as well as the state of Iowa, will produce fruit, and

especially apples, that will be known all over the country. Now the subject assigned to me is one with which I am somewhat familiar.

It is the advisability of fruit growers' associations in the Missouri valley. I have prepared a paper, but it is not quite as long as Mr. Van Houten's. My vocabulary is not as extensive as his, or at least my idea of words to be used, so I had to cut it short.

The subject which has been assigned to me is of such great importance that I have not the temerity to theorize upon it; therefore, I will merely offer a few observations of facts that have come to my notice during the thirty years that I have been actively interested in horticultural production where I live.

Fruit growing is full of uncertainties and hazards: the destructive freeze of winter, the springtime late frosts, the midsummer drouth, the fall of hail, the ravages of insects, and last, to my mind the greatest of all, the uncertainty of the market. We may escape the freeze and drouth, prevent the frost, insure against the hail, and destroy the insects, but unless we can secure a market and reach it with our perishable commodity in good condition our plans go for naught, and we have nothing to pocket but a net loss.

The elimination of these hazards is the constant study of horticulture. It is the last one upon which I am to treat. In the first place, our knowledge of the market is limited to the experience and observation of the individual who produces the crops. Some people like plums, some like strawberries; none of us know how many like the one or the other, and we know but little of what is being done by other growers to supply the demand for the one or the other. Furthermore, we know very little of what competition our produce will meet with in the produce of other parts of the country, and so we plant without adequate knowledge of the demand and produce fine fruit, but who wants it when every one has had enough? We find to our sorrow the difference between a hungry buyer and one who has had his wants satisfied. And so, as very often happens, our local market is oversupplied and the surplus is sent to the larger cities. What is the result? The hazards in shipment of perishable fruit are great and the responsibility of the buyer often questionable. Moreover, the care which one who has no financial interest in our fruit displays is very different from the interest of the grower who has expended his hard labor to produce it.

And so with prices slaughtered the margin of profit is decreased, and the natural impulse of the grower is to secure large production, for without it he can not hope to secure an adequate return, and in the mad rush to produce large quantities, the market is still further demoralized and quality is sacrificed because in the great oversupply of cheap stuff it would not be recognized, and the public turns to other sources of supply to satisfy its wants. The result is that the grower frequently becomes disgusted with his venture, plows up his commercial fruit, or neglects it, and directs his energies to other crops. As a result of the conditions above set out, a commercial organization of fruit growers is absolutely essential to any community which produces fruit extensively for the

market. One grower can not afford to employ a man to study the markets and estimate the demand for any particular variety of fruit—twenty growers can, and the information secured can be relied upon to the end that only so much fruit may be grown as will supply the local market and secure an adequate outlet in distant markets. His advice need not be binding upon his employers further than the dictates of self-interest—that will be enough. A complete organization with a competent manager, as outlined above, can also study market conditions at distant shipping points and investigate the business standing and rating of concerns dealt with, eliminating losses through irresponsible consignees and bad markets. To my mind, one of the greatest functions of an organization is to raise the standards of quality in the fruit produced by its members. Very often this is a matter determined by competition, but can only be understood and attained by first-hand knowledge of its requirements. Let the organization, through its officers, require that no fruit bearing the stamp of the company be offered for sale that is not up to or above the standard set by its competitors, and there will be no difficulty in finding a market for all that is produced. In fact, a constant extension of the market may be expected. An absolute standard of quality is the best advertisement you can have.

When it was found that grapes could be successfully grown on the hill lands surrounding Council Bluffs, the number of vineyards increased until the crop exceeded the demand of the local markets of both Council Bluffs and Omaha. Then the growers were obliged to look for markets beyond, and placed their fruit in the hands of commission men for distribution wherever a demand could be found, but the system was found so unsatisfactory that the growers decided upon an organization of their own, to avoid some of the troubles and disappointments which they experienced under the system they had followed thus far. In January, 1893, twenty-one of the principal growers organized what is known as the Council Bluffs Grape Growers' Shipping Association, which has conducted its business successfully ever since, whereby it has handled not only the grapes but such other fruits as were produced by the members. The company was incorporated and each shareholder of the stock was entitled to participate in the dividends based upon his individual production. The association now owns the building occupied to transact its business and a large storage warehouse, and has an established credit. You might as well ask the members of this association to dig up their vineyards as to abandon their association. The last statement of the Council Bluffs association shows the distribution of nearly \$100,000 among its members, and growers are becoming better satisfied with its transactions each year. Fruit growing can be made as profitable as any other occupation. The returns from the amount of labor and capital expended can be made better and more certain than most any other business, but between the production on the farm and the sale in the market there is a gap which has caused losses and discontent to many hard-working and painstaking fruit growers. My experience and observation lead me to

believe that the only adequate method of filling that gap is by the proper organization of fruit growers' associations, properly managed.

The day is not far distant when every fruit growing community will have an association, and must have it in order to be successful. One writer who has tried to ascertain the number of co-operative fruit growers' associations finds there are between 250 and 300 such associations in the United States. And while the Council Bluffs Association is doing a comparatively small business compared with the associations in the West and Northwest, its plan of operation will nearer meet the demands of the fruit growing communities of Iowa and Nebraska than some of the extension associations of the Northwest where the business handled amounts to millions of dollars.

DISCUSSION.

The Chairman: This paper is now open for discussion. If any one has any questions they would like to ask, Mr. Hess is ready to answer them.

Mr. Williams: There are some points in Mr. Hess' paper that I would like to see discussed, and I will state in regard to these associations: It is now just about twenty years this winter—I think in January—since this association was organized, and I know from my early experience with it it was then at a point where it did a very small business for the first few years. But it has had a gradual growth, and when you think of its handling \$100,000 worth of fruit last year, it shows quite a growth from the early beginning. I have been thinking though of a larger need for a larger association than this, that should reach out into larger territory, that is to cover a territory of perhaps several states, and when Mr. Hess announced his topic as the need of associations in the Missouri valley I thought perhaps he would touch upon the subject of associations covering the entire Missouri valley.

I notice this morning in reading my Western Fruit Grower from St. Joseph, Missouri, the account of an association recently formed in Spokane, in response to a meeting held in November, in which the four great states of Oregon, Washington, Idaho and Montana, united together to form a great association for the placing of their surplus apple stock and others they have may. It occurs to me that some association of that kind should be formed here, embracing the southeastern part of Nebraska, and southwestern Iowa. Council Bluffs does well enough for it to have its association, and it may well have a dozen other associations, but they need larger communities so that they can work together in harmony, and know where best to place their surplus fruits. As an instance of this, now last fall I was up with a car of apples in South Dakota, and I went independent of any association, but I realized after I got up there if I had had advice through some large association as to the state of that market I might have been much better off. There are large towns in which I might have done better than the one I went to, and then this fall I shipped a carload instead of shipping out a car into my home place, Uni-

versity Place, and just after my car came in there was another car came in and there were two of us there in direct competition with each other. If we had been members of some large association so that we could have gotten direct information from the markets at large, we would have been in a position to determine where and how to have placed a carload of fruit. That is just an illustration to show the necessity for any grower or shipper or dealer, wherever he may be, to work together under some of our associations so that they may be able to place their crops of fruit, whether it is their own growing, or a dealer placing it, to the best advantage.

Professor Lorenz Green: If the gentleman will pardon me, I do not believe that the gentlemen quite stated what they intended to say. He said that they needed larger communities. It seems to me they need smaller communities, not a large community. The Ozark Fruit Growers' Association handles several hundred carloads of strawberries every year. That is made up of twenty or thirty smaller associations, and they have been very successful, and their plan is what we need in the Missouri valley, one large central association to handle the product of the smaller organizations in the Missouri valley.

T. F. Sturgis: There is one thing right in connection with this and it is something I would like to call attention to. And that is, that any association that has been suggested, such as a Missouri Valley Apple Growers' Association, would mean the establishing of a market for the Missouri valley apple throughout the country as the gentleman has just mentioned. In such associations all the growers in their communities, as individual growers, ship and pack under the name of this association, and it all goes out under one head. That is the case with the Hood River apple, in the Hood River Valley Fruit Growers' Association.

Now from an advertising standpoint is what I wanted to call attention to, rather than a growers' standpoint. The fruit growers of California raised a fund to spend in publicity throughout the United States, and advocating prunes as a diet, and when that demand was created, the people went and bought prunes; and this association that had put up the money did not get the direct benefit but another association that started a campaign and advocated the use of a certain prune, because of its quality, just as we would advocate the Missouri valley apple, and after they had created a demand the first thing a person thought of when they called to buy prunes was the prune of this quality that had been advertised. Now I think we should have a Missouri Valley Apple Growers' Association, which would include both sides of the river. This should be organized, and a campaign of advertising should be started, and the amount to each grower would be very small. The market is here, and the demand is here, and we could have apples just as good as the Hood River valley apple, or the Ozark strawberry, or any other fruit. I want to see an association that will boost the Missouri river valley, and I hope that next fall or next year, if this plan of association is carried out as expressed by the committee, that I help entertain you in Omaha, and that we will have a commercial

show bigger and better than the one we have here this year, and I am here to invite you to come to Omaha next year.

A Member: For the last three weeks I have been in the east and the people back there did not seem to think or realize that we could grow apples at all out here, and they would say "Apples in Nebraska, they can not be as good as in Michigan or New York." That would be wherever I happened to be. And I naturally told them we could beat them even if it was three to one when they were talking to me. And, of course, I told them that we did not grow as many varieties as they did, but we grew more and I think we need this association to advertise our apples, and for the business of locating our markets.

Mr. Hess: I think the gentleman from Omaha is correct in advocating the central association, but you need the small associations to join in and form these large associations. The large associations have to be formed by the smaller ones. There are so many things that can be done in the small association that are helpful to the grower that perhaps the large association could not take care of. Now, for instance, the purchasing and handling of the material, the boxes and barrels, and the spraying material, and all these things would be handled through your local association, which is a big advantage, because you can buy at wholesale rates if you want to. And it is a tremendous help to a small grower. Now, a man with a small orchard at a small place, unless he has an association, he is at the mercy of somebody else, but if he is in an association he shares equally with the rest of the members, because the expenses are paid, and if there is any money left he gets a pro rata dividend for the amount of fruit he sold. Now, in every community where there are twenty or fifty growers, I think these associations are needed to encourage the grower, and the expense to start with is not very large. I really believe that as large as the gentleman from Omaha suggested here would be an advantage to a smaller association. That is what it will come to.

A Member: I will say this regarding advertising: Do you advertise so that people in Omaha will know that you raise apples in Nebraska? If you go to a grocery store they will sell you an apple from Washington or Idaho, 1500 miles off, when they can get an apple of a far better flavor although not so large, from 100 miles away. Now, if you are contemplating advertising in Omaha, advertise your home apples and sell home apples.

Mr. Pollard: I have been very much interested in this discussion relating to the formation of a fruit growers' association. I see here quite a number of gentlemen who were at Auburn two or three weeks ago. I perhaps may bore some who were here yesterday when I made the remarks that I did. But I feel that I should say a word now when this question is open for discussion. I want to say that as a result of the Auburn meeting, and as it happened I was the temporary chairman, and was called upon to appoint a committee of fifteen to draft a constitution and by-laws for the government of such an association that that commit-

tee meet in this room tomorrow afternoon at 2 o'clock to perform its labors.

Now, I have long felt the need of such an association, but I did not know how to go about it. I did not know what that association should do, or what scope it should take, or anything of the kind, but the secretary of the horticultural society told me if I would write to the Missouri Experiment Station at Columbia I could get a bulletin published by that association of the constitution and by-laws of the fruit growers' associations mentioned here this afternoon. Now, after the meeting in Auburn had designated me as its temporary chairman, I felt that I should write for that bulletin, and did so. I spent about a week studying those different associations, their constitution and by-laws, their method of doing business, and so forth, and the scope of their field, and when I had finished I went to work on trying to formulate a constitution and by-laws for an association that would fit conditions in Nebraska. After I had made a draft I came to Lincoln and got in conjunction with the secretary of this society and another man I had appointed on this committee of fifteen, and we drafted a constitution and by-laws, and I hope that everybody will have a copy of that tonight.

Now, I feel, Mr. President, that this is an experimental improvement matter, and personally I would be very glad indeed to receive the criticisms, friendly, of course, they naturally would be, to the plan we have to offer. If any one can give us something better, that is what we want. If there is anything different could be done, or if our plan falls short, we want it correct, so that when the association is formed we will have one that will be workable, and one that will be practical, and one that will be a success above everything else.

Now then, the general outline of the plan we have is this: In the first place, we formed a central association. We were divided in opinion as to whether or not that should be confined to Nebraska as a whole, or whether or not that should include our brothers across the river in western Iowa. That is the question, as to whether or not we should do that. Personally, I do not think it would be a bad idea for the association to cover that territory. We produce fruit of a similar character, similar varieties, and similar quality. So that we could establish a reputation for fruit coming from a certain district. We all know that apples grown in Cass county, in Nebraska, or any other of the counties in Iowa across the river, would be of similar quality, other things being equal. Or a Winesap grown in Cass or any of the Nebraska counties situated in the southeastern part that the qualities would be the same. Now, whether this association should start out and cover the Missouri valley, or whether we in Nebraska should confine our operations to Nebraska, is an open question.

We proposed this form that there could be organized local associations at the different points, the association to be composed of not less than fifteen members, and they become members of the state association. The state association would be incorporated with a capital stock, and a share

of stock would entitle a man to the privilege of the association. Now, briefly, that would be the scope of the association, and its plan of organization, and then we would have a board of seven directors. Of course, the number is not so important provided it is not too large; seven, I think, would be the best, with president and vice-president, who would be ex-officio members of the board and officers of the association, to be elected at the annual meeting of the stockholders. And then we provided for a general manager, who should have charge of the selling of all the fruit grown by the different members, and that general manager we undertook to hold responsible for the character of the packing.

For instance, under the general manager, or by his direction, we provided for the appointment of a chief inspector, who was responsible to the general manager, and a series of local inspectors to be responsible to the chief inspector. And they should call upon each packing point where the fruit was packed, at least once a month, so that he would be thoroughly in touch with the work, and make sure that the fruit came up to a standard and to a certain grade. And then we provided that every packer should have his name registered with the secretary of the association and with the general manager, and that the secretary of the association should give that packer a number, and he should be known by number only, and that every package of fruit that went onto the market should be marked with the name of the grower and the packer, so that when it went onto the market there could be no question as to who packed that fruit. Now, I know in my own experience when criticisms of certain packages came to me of fruit that was put on the market, that because of the fact that I have four or five men packing and occupying the head of the table, that it is absolutely and utterly impossible for me to tell who put up that faulty barrel. This one said he did not put it up, and this one says he knows he did not put it up, but if the number of the packer is on the package I know who put it up, who put up that particular package of fruit, and then we will either see that the man puts up that package of fruit properly or else his services can be discontinued. Now, briefly, that is the plan of organization.

We undertook to divorce completely the grading of the fruit from the agent or the owner, so that when the owner indicated the grade of fruit he was shipping—when the grower determined the grade that he wanted his apples packed under, whether it should be fancy No. 1, or whatever it might be, then he hadn't a thing in the world to say about what went into that grade. It was the business of the general manager, through his inspectors, to see that the apples were graded in strict conformity to the grade established. In that way we would build up a reputation for honesty of packing; and when the association puts a stamp on a package I believe it can mean something. It would be a guarantee to Mr. Consumer that when he got a package of fruit upon which was the association brand, it was true to name. If it was marked "Fancy," it would be fancy, or if it was marked "Number One," it would be number one. I think that after we have formed an association and established those grades that we should know when a package gets on the market that it is true to name,

and true to the representations that it bears on the outside of the package.

Now, this plan that I have given you is one that is largely mine, and one that I have evolved from a careful study of these other associations that are a success in the large fruit belts of the country. It is not a creation of my own mind by any means, but I present it to you simply for discussion, and so far as I am concerned I have no private opinion in the matter at all, but I would like to see a fruit growers' association formed that would improve the standard of our fruit, and that would improve the pack so that we would have less of this riff-raff, or what I call junk, that goes on the market, simply glutting it, and that not only interferes with the sale but decreases the price of good fruit.

Gentlemen, it seems to me that it is up to the fruit growers of this state and of this valley to claim our own. You go down into the city of Lincoln or the city of Omaha, and go into the grocery stores, and you see packed up in tiers box after box of Washington or Colorado or Idaho apples, and I would not be afraid to leave to any man who has any taste for fruit at all the question as to the superiority of our fruit over fruit grown out there. We can not get apples quite as large, or always put the color on them, but we get the quality. We not only have texture and quality but for keeping our fruit will stand up better in storage than theirs. It has been demonstrated time and time again that as far as the texture of the fruit is concerned, our fruit is away ahead of theirs.

Should we sit idly by and permit these men of the Northwest to come here and supply our market with fruit? It does not look right to me, and I do not believe we will ever meet the situation gentlemen, until we get together and form a workable marketing association, where we establish brands and grades, and then make that name of the association, when we put it on there, an absolute guarantee that it is as we represent it, and when you reach that point, I think you will see less of the Oregon and the Washington and the Colorado, and Idaho and Utah fruit on our market, and it will be a Nebraska apple, or Nebraska fruit, and I think that is the point we should reach.

The Chairman: This discussion is very interesting, and it is very important, but the time is passing rapidly, and we have one here with us who has duties elsewhere, and he must go to meet them, so we will listen to a paper from Mr. Val Keyser of Fairbury, on the subject of "Leasing Orchards."

LEASING ORCHARDS.

Val Keyser, Fairbury.

I will have to take just a few words to explain this subject. Of course I can only discuss from the standpoint of the lessee, and one who is going out to lease an orchard. I thought about this considerably before starting the preparation of the paper, and I wanted to touch on both sides of the question, but I do not own an orchard. In looking over the country and the situation and the men, and making a financial comparison between

those that are leasing orchards, and those that have them for lease, I took it for granted that most of the men who had orchards they would lease, did not need any looking after. They are well able to, and they have made their start by some other means, and so I want to discuss the matter along the line of the young man or the old one, or any one who is going out to lease an orchard. Those in the audience who have orchards to lease, I will leave it to them to discuss the other side of it, and I want you to feel free to take exceptions to any statements about apples or orchards, or anything in this paper.

The practice of leasing orchards is rather a new venture in Nebraska. In making this statement the writer has not considered the fact that scores of farms have been rented, upon which were standing orchards varying in size from one to fifty acres, because in these cases the producing power of the orchard was rarely, if ever, considered by the tenant, when he signed the contract agreeing to cultivate the land.

The object of leasing an orchard from the standpoint of the owner, is in most cases to get a definite annual cash rental out of the orchard which is an uncertain producer and a general nuisance to care for.

From the standpoint of the lessee, to be able to lease an orchard grown and ready to bear, means a saving on the investment and gives an opportunity for an annual income. This income is the all important consideration in leasing an orchard, and it depends upon a great many factors which must be considered by the man who is expecting to lease an orchard, as to a profitable investment. The writer does not presume to mention all of the factors in this brief article, but will enumerate and give a brief discussion of a few which have come within his experience.

We have a right to assume that any one who is sufficiently interested in apple growing to lease an orchard for the purpose of producing a crop of apples, intends to cultivate and care for the trees in accord with up-to-date methods of orchard management. This being the case a discussion of the various problems and considerations which apply will perhaps be of as much interest as any phase of the subject the writer might discuss.

The Selection of an Orchard—In choosing an orchard to lease for a term of years, we must examine it from several points of view. First is its location in relation to soil, annual rainfall and geographical position. An orchard might be perfection in every other respect, but if it was not located in a good apple producing section, on the right kind of soil, and where there was plenty of moisture to put finish on the crop, the owner could not run fast enough to lease it to any man who has had experience in growing apples. It may take years of experience in the problems of handling an orchard to demonstrate just where in Nebraska, the geographical line should be drawn. It would seem, however, that forty years of experience in growing apples should be a good recommendation for eastern Nebraska, and the writer will be bold enough to state that other conditions being equal the loess soil along the Missouri river would be the best location for the selection of an orchard. Any of the land from Sioux City to Kansas City will produce fruit, but in selecting an orchard to lease,

one is looking for the best location and perhaps the boundary line should be drawn in general from Omaha to St. Joseph. Last winter demonstrated that orchards located north of the Platte river suffered some from winter injury. As we go south from St. Joseph we find a few quite serious problems such as insect enemies, diseases and more hot fall days, which add to the problems of handling many valuable fall varieties of apples.

There are other problems of the location of an orchard which we must look at from a different point of view. One of the most important is nearness to shipping points and proximity to storage facilities. The writer has had personal experience in handling crops of apples grown in four different orchards, each orchard located different distances from the shipping point.

The distances from orchards to railroad siding were eighty rods, two and one-half miles, five miles and six miles respectively. One man and team would haul eight loads per day, where the trip was only one-fourth of a mile. In the orchard located two and one-half miles from the railroad station, the same team and man hauled three and four loads per day, while in the orchards located five and six miles from shipping point, two loads constituted a day's work. One of the finest orchards in Nebraska is located nine miles from shipping point and at this distance, a man and team will handle but one load per day.

Our teams hauled eighteen barrels per load at an average cost of four dollars per day for man and team. In the orchard located eighty rods from the station the cost of hauling was two and eight-tenths cents per barrel. And in the orchard located six miles from the station the cost was 11 cents per barrel. While an expense of even 11 cents per barrel seems small, it is an item which can not be overlooked when handling a crop of apples. It means \$11 per hundred or \$110 for every thousand barrels of apples. The expense is likewise proportionate for haulage on empty packages, and to this additional expense must be added for necessary trips for repairs and materials needed during the growing season of the crop.

In this connection we must not forget to figure that time wasted during second spraying is costing the grower from \$1 to \$5 per hour.

Age of the Tree—The age of the trees is not a very important consideration in the proposition of leasing an orchard, because most of the orchards which can be leased are upwards of twelve years of age, which makes most varieties in prime bearing age. This is due to the fact that very little planting on a commercial scale has been practiced during the past ten years. The writer has inspected a few orchards which were offered for rent which were not considered a good proposition at \$10 per acre on a five year basis, on account of the trees being young and too small to produce profitable crops. If these same orchards could have been leased for a period of ten years the proposition would have been worth considering.

Varieties—One of the most important considerations in leasing an or-

chard is the varieties and number of each variety planted. Many of the orchards which it is possible to lease on reasonable terms would be discarded by the experienced apple dealer on account of the predominance of undesirable commercial varieties. The grower can handle at a small margin of profit, provided the orchard is located right, a small amount of summer apples, but it has been our experience not over ten trees out of a thousand should be summer varieties. The abundance of other fruits and fresh vegetables on the market at this time of the year cut the demand and price to the point which makes the handling of summer varieties unprofitable.

Good fall varieties such as Wealthy, Utter and Snow, can be handled profitably, but under average conditions 90 per cent of the orchard should be winter varieties. There is a vast difference in winter varieties. Time will not permit of a lengthy discussion of the merits of the different winter varieties from a commercial standpoint. The writer can state that we have found our Grimes Golden, Jonathan, Winesap, York Imperial, Black Twig, Ben Davis and Gano always in demand. The point the writer wishes to impress is that the varieties and number of trees of each variety must be considered in determining the rental value of an orchard.

Health of the Trees—The condition of the trees in regard to effect by disease is another important factor in determining the value of the orchard. The Illinois Canker has become so injurious in orchards in the Missouri Valley states, that a large number of trees in old neglected orchards have become practically worthless. The science of modern orcharding has taught us that this disease can be checked and controlled in cases where the trees are not seriously injured. It requires the exercise of a critical examination and good judgment to determine to what extent a tree may be injured by this disease so that a sufficient amount of the top may be saved to produce paying crops. This disease is found in practically all of the old orchards which it would be possible to lease. The health of the trees must not be overlooked by the man who expects to lease an orchard.

Pruning—Another important consideration is the manner in which the orchard has been pruned or rather the extent to which the pruning has been neglected. It costs money to prune an orchard and remove the brush, and this cost must be added to the first two years' expenses in caring for the orchard. It is difficult to estimate the cost of pruning, as so much depends upon the size of the tree and amount of wood to be removed. Mr. Marshall and I have found that the cost of pruning ranged from 10 cents to \$1 per tree. The work was conducted in trees ranging from eight to twenty-eight years of age. The matter of pruning is one of the first things to figure in determining the rental value especially in a short lease.

In regard to borrowing money to commence handling the orchard I figure that if there are any men who are in the same position I am in, about two years is all the bank will trust a fellow, if he will pay up, and after the two years, there is additional pruning enough to keep that or-

chard in shape, that I believe you should charge that pruning up to the first two years' expense.

Cultivation—To one who is examining an orchard to lease the topography of the land must not be overlooked. There is rarely ever a season during which a little cultivation would not be beneficial, and most orchards should be thoroughly cultivated throughout the growing of the fruit crop, in the ordinary season. The writer has seen orchards offered for lease which were planted on land so rough and rolling that cultivation was next to impossible and not at all practical. The character of the soil has much to do with the problems of cultivation and should not be overlooked.

Terms of the Lease—Perhaps all the writer might say concerning the contract between the owner and the lessee which would be of any benefit to fellow workers would be along the line of length of the lease. We have had experience in a three year crop lease, but all other orchards handled by Mr. Marshall and myself are under a cash lease. We prefer the cash lease of not less than five years. It is not likely that the average orchard will return enough profit to pay the expenses of running for the first two years. There are some orchards which have received reasonably good care that would do much better than this. It is quite impossible to estimate the rental value of an orchard unless the different factors effecting the producing power of the trees, which have been briefly discussed in this paper, are taken into consideration. Generally speaking, it would be the writer's opinion that the average good orchard in Nebraska should command a leasing value of from \$10 to \$15 per acre, per annum.

In conclusion, it seems that the practice of leasing orchards bids fair to become quite common in the eastern part of the state.

There are several general things I wanted to say, but I left those out. One is this: If just the work that has been done in this state, the leasing of orchards by going into communities where there was little knowledge of the modern methods of the care of the orchards, is to be considered, one might well look upon himself as a public benefactor by stimulating the interest in the community for taking care of the orchards. And I think that is the case. Whenever orchards are taken care of, it is going to stimulate an interest in the community to do better.

DISCUSSION.

Mr. Pollard: There is one thing I would like to ask, and that was in regard to the varieties that you would suggest should be in an orchard. I notice you do not want any summer varieties, or very few?

A. Yes, sir.

Q. Now wouldn't you make an exception in regard to the Duchess?

A. I didn't mention the name of any summer varieties, but possibly that would be all right. We always found that the Duchess we were handling have sold about as well as any apple we had. But I have seen Duchess apples stand in the depot at Weeping Water a day longer than

they should, and when they got to the destination in Lincoln, it took four barrels to make three—there was that much shrinkage in them. It is a question whether the young fellow in starting out, would do better in not leasing an orchard that has too many varieties of the summer variety in them. Of course that is my advice to young fellows from my own experience.

Mr. Pollard: The Duchess should be handled just about the same as a peach, it won't stand lying around in a depot or packing house, or anything of that kind; it must be moved. But our experience at home has been, there is more money in the Duchess apple, than any other apple. I would rather grow Duchess apples, from a commercial standpoint than Jonathan, or any other apple in the world. If we get this fruit growers' association we can handle them in small quantities.

The Chairman: The time is passing very rapidly, and we will pass on now to the next paper, and as far as any further discussion on this paper is concerned, it can be brought up afterwards.

COMMITTEES.

The Chairman: I will announce the committee I have appointed thus far. The committee on resolutions will be Mr. E. M. Pollard, of Nebraska; Mr. L. M. Russell, and Mr. L. O. Williams.

The committee on the revision of the premium list will be G. A. Marshall, J. R. Duncan and C. H. Green.

INSPECTION BILL.

Mr. Chairman: About the bill for the inspection of nursery and horticultural products in Nebraska. You will remember that I told you that in Nebraska we had no inspection laws of any sort and this new federal inspection law, makes it necessary that we should have some law for inspection, for our own protection.

I told you that a bill had been prepared for the legislature and in my judgment it is a bill that we want passed.

I have the bill here now and it is very lengthy, and probably Professor Bruner can tell you more than anybody present as he was called into consultation to help draw up a bill, and if there is no objection, we will ask Professor Bruner to tell us about what this bill means.

Professor Bruner: I will say this much: that during the past, very nearly every one of the most destructive insects that have reached American soil, have been imported from foreign countries, and as an example of these, I will say that the house fly is an imported insect into this country. The gypsy moth and the brown tailed moth are imported insects, and the cotton weevil of the south is an imported insect. I might repeat fifteen or twenty additional references of this kind, showing that our most destructive insects, or at least nine-tenths of the destruction caused by these pests is from the imported insects. A number of states of the Union

began some years ago by passing bills in their legislatures making it necessary to inspect nursery stock, but afterwards it was necessary to take in almost any other plant material, whereby insects could be transported from one state to the other. At present, every state in the Union, with the exception of Nebraska, has a law of that kind.

Just last year there was a federal inspection bill passed by congress, which made it necessary to inspect all kinds of material, including a number of different kinds of bulbs, and greenhouse plants, and seeds coming from foreign countries to see that they were free from insects, and in good condition, and under that bill I have been inspecting some plants that are arriving into this country from abroad, from France, Germany, Belgium, and Holland, and other places, and so far as I have been inspecting plants in Nebraska, I have found the brown tailed moth, the gypsy moth, the San Jose scale, and five or six other insects that would be equally destructive if allowed to come into the state. This bill that was drawn up was framed with the intention of driving out, or trying to prevent the introduction into the state of these dangerously destructive insects, and also the fungus dangerous to plants.

The bill is prepared in accordance with the laws of the statutes in other states around us, and not taking the worst features of those laws, that makes it so very imperative that if you find an insect on a single shipment of a thousand trees, that you should destroy the whole thousand trees, but we say to destroy the one tree that you find an insect on. It is not a bill that would work hardship on a producer. It has also included that the commercial nursery should have an inspection made, and ship under a certificate issued by the inspector. It has also included that if you find these injurious insects that can be destroyed, that under the direction of somebody that knows, these insects should be destroyed, either by the property owner, or the state authorities if the property owner will not do it. It is not confiscatory in any way, and we tried to be just as lenient as possible in getting it out. And I know that the members of the State Horticultural Society tried to be more stringent than I did, but I should like to see something of this kind go through, because I had a letter recently from the head of this federal bureau in Washington, stating that if Nebraska did not soon come through with a law of this kind that it would be necessary to quarantine against Nebraska by all other states, and we do not want anything like that.

The Chairman: I wish to state further that this bill was prepared by the committee from this society laboring with Professor Bruner. The nurserymen generally of this state would prefer to have the thing just as it has been, that is, so that there is an absolutely free commerce between the states, between this state and other states, speaking from a nurseryman's standpoint. We do not want anything that is going to hinder Mr. Lake or Mr. Welch or dealers of any other state that has clean stock from sending it in here.

Mr. Duncan: In order to put this matter on record, I have a resolution to offer to the society here.

RESOLUTION

Since all of the states surrounding Nebraska have seen fit to pass laws requiring the inspection of nursery stock, fruit, shade, ornamental and other trees, shrubs and plants for the purpose of preventing the introduction and spread of dangerously destructive insect pests and plant diseases, and since the general government has also seen fit to legislate in the same direction therefore be it resolved that the Horticultural Society of Nebraska here in session does hereby recommend that the present legislature be asked to pass the inspection and quarantine bill now pending.

Mr. Duncan: I move the adoption of this resolution.

Seconded. Carried.

DISCUSSION ON SPRAYING.

The Chairman: I notice that the next subject on our program is a discussion on spraying. If you are prepared to discuss that matter we will take it up at this time, if not we will try and reach it tomorrow.

A Member: The man, in the discussion of the leasing of orchards, spoke something about the second spraying, I did not understand what he meant.

The Secretary: He said that the time lost during the second spraying was costing from \$1 to \$5 an hour, and that he wanted to emphasize that strongly. He meant if we had to lose time in making trips to points quite a distance away to get supplies and so forth, and that was the most important spraying of all, and the time spent at that time in getting supplies and so forth was very costly. So we had above all things better be prepared for that spraying.

The Chairman: We will now take up the question box.

QUESTION BOX.

The secretary read the first question as follows: "Is it not a fact that the world-wide planting of apple trees will soon force the price of fruit down to the cost of production?"

A Member: From my observation from a three thousand mile trip to eastern Pennsylvania and back to Nebraska, over different routes, I would say that old orchards are dying faster than the younger orchards are being planted, so that at present in this section there is no danger of there being too many orchards and lessening the price for that reason.

C. G. Marshall: You know that apples are rather cheap, and they say there is a big crop,—and I think that the chief trouble has been that the people have been educated away from eating apples, simply because they have been so high priced, the last few years. The man who is handling apples, the retailer, is expecting from one to five hundred per cent profit. And the middle man, the commission man is expecting a profit on them.

The people consequently are not buying apples like they did a few years ago. In 1896 there was a production of almost seventy million barrels of apples in this country, and this year, forty million. Just about half of the production of sixteen years ago, and yet apples are comparatively cheap in this country. Now what we have to do is to cut down profits. There is a great problem that the growers have to work out, or we are going to have an over-production, if we are going to keep these apples so high in price that the ordinary man can not afford to buy them. We are going to produce more fruit than there will be a demand for; but if we will keep the price down so that the ordinary man, the poor man, can buy apples, then you will find that it will be a long time before there will be an over-production.

Mr. Yeager: Right along that line I have in mind something that came to my notice last September. Down in Otoe county they produce a great many peaches, and on this certain day that I am speaking about peaches were on hand in Nebraska City, in quite large quantities at 30 cents per bushel. On that same day in Omaha, they were \$1.25 a bushel, and the cost of transporting a bushel of peaches from Nebraska City to Omaha, a distance of something like fifty miles, in round numbers, is about 8 or 9 cents. Now that is along the line of what Mr. Marshall said and he has said something that is worthy of notice to the grower, because you have got to have a price for the consumer, on a basis of getting a fair revenue or return to the grower. But the trouble is, there are too many middle men. Now there is a concrete example, and I am quite sure my figures are right; I have them, but not at my command now, but that is approximately true. That is a concrete instance I call to mind now in support of what he said.

A Member: Doesn't this bring you back to the proposition, that it is just as important to sell right, as it is to grow right. The shortest route from the producer to the consumer brings the most profit to the producer, and better satisfies the consumer. Now you are right back to your organization for selling, and having your men who make it a business to market your stuff, and study the market and make it a business, just as much as you make it a business to grow the fruit. There is not one man out of fifteen that knows how to sell, but he knows how to produce, and it is because of the reason that he has not studied how to sell. He has not the time to do it, and there is a necessity now for your selling organization.

The Chairman: I see that Mr. Odell is in the room and we will now listen to a paper from Mr. Odell, on "Advertising the Apple." I am sorry that a great many of the crowd went away.

ADVERTISING THE APPLE.

Frank G. Odell, Lincoln.

I am like the congressman, I always have leave to print, and the crowd can get it afterwards. I am sure that I need not make any apology to this audience because of my somewhat hurried state this week, and the fact that this paper is incomplete. After I shall have read what I have written and have said all that is in my mind, and in my heart to say concerning this subject, I think you will have had enough.

The title of this paper is sufficiently novel to attract attention in a Nebraska audience, whatever its merit as to subject matter. Two years ago one would have been regarded as foolish had he publicly favored advertising one of Nebraska's chief products; today there is no news item more eagerly sought and printed than that which deals with the interesting fact of Nebraska's present high rank as an apple state and her assured future preeminence.

I use the term "assured future preeminence" with some ground for the faith which is within me—permit me to say frankly that I am not an expert horticulturist; it would be a matter of some difficulty for me to readily identify more than a dozen varieties of apples; bugs and scales and crown galls and cankers are not my familiar acquaintances; but when I see fruit such as glorifies yonder auditorium and realize that there are not less than four million acres in eastern Nebraska which will produce its equal under skilful attendance, it is not presumptuous to speak of the future of Nebraska orcharding as assuredly preeminent.

I presume that your capable secretary asked me to prepare this paper for a reason which is known to most of you; about four years since, my first visit was made to the highly exploited fruit growing sections of the Northwest: the irresistible fascination of artistically displayed fruit in the mass took strong hold of my imaginative faculty and like most visitors to that country I was captivated by what seemed to me to be its possibilities. For weeks I was brought into hourly contact with the infectious atmosphere which pervades the personality of every citizen in that progressive country. The spell of the mountain and lake, coupled with the genial influence of the ubiquitous land boomer laid strong hold on the senses: I frankly confess that had I then been free to invest, it would have been an easy task to get what little money was in my possession in exchange for a few acres of desert; now it is different, I know better.

Since that time it has been my privilege to make several other journeys into "the land of the apple," so called, and with unusual opportunities for observation, I have been able to learn some things exceedingly profitable to me, and, I trust not without profit to the state which we love. It is concerning these things which have been revealed to me that I desire to talk with you briefly on this occasion:

THE GENTLE ART OF GETTING OTHER FOLKS' MONEY.

In the gentle art of getting the money of other folks, the land boomers of the Pacific Northwest are post graduates; they can sell more land on faith inspired in the other fellow, than any company of men on earth. I like the scriptural definition of faith as given by the Apostle Paul, in his epistle to the Hebrews: "Now faith is the substance of things hoped for; the evidence of things not seen." There is more money invested in lands in the Northwest on the substance of things hoped for, than in the visible evidence of things yet seen, as it shall be my endeavor presently to prove to you.

I am not unconscious that this is dangerous ground; there is enough Nebraska money invested in irrigated fruit lands, and in lands which the owners hope may sometime be irrigated, to make of this an exceedingly delicate topic. When my first modest efforts to advertise Nebraska as worthy of consideration as an apple growing state were put forth, they were greeted with the merry hoot; even professors of horticulture in your university thought it not beneath their dignity to publicly denounce the presumption of a layman who should call into question the dominance of the Northwest in an industry in which you won capital prizes in world shows when that far country was still the habitat of the Indian. It took nerve, but nature has been kind to me and I eat celery frequently as a nerve stimulant; hence the venture, with which some of you are familiar.

You are not here, however, to listen to relation of personal experiences; most of the members of this society have been in the game of advertising the apple for many years before my modest attempts in this direction; my chief purpose is to point out, if possible, some of the particulars in which you have failed in the commendable effort and other means by which you may possibly succeed.

If the men who are making land values on paper over night in the Northwest should be transplanted to Nebraska, and see your orchards laden with fruit in the autumn, they would be able to do with this goodly land precisely what they are doing with that,—persuade the prospective investor that it is a potential paradise. Life is not all apples in Washington, nor roses in Oregon; they have sand and rust and codling moth; scale and canker and crown gall; every pest known to the world of horticulture is to be found in that country; difficulties which test the courage of the bravest exist there; why do they succeed? Chiefly because they have that faith which is the evidence of things not seen and the substance of things hoped for. Those who are not getting rich selling apples (and their name is legion) are hoping to get rich selling apple land to such as are possessed of both faith and money. You hear much of the fortunes which are being made in apple growing in the Pacific Northwest; my observation, extending over some thousands of miles of travel and personal investigation covering several years, leads to the belief that more fortunes are grown by raising the price of land than by raising apples; and to prove this contention I shall presently cite to you some authority

which even my optimistic friends of the Northwest will scarcely dare question.

THE PSYCHOLOGY OF ADVERTISING.

Advertising is a study in psychology; the advertising expert defines it thus: he says that successful advertising consists of three steps; first, attract the attention; second awaken an interest; third, close the sale.

Now you good folks have been running this splendid horticultural society for nearly a half century; you have had fruit shows every year at the state fair, held your meetings and been doing yeoman service for the development of the state, but still the world outside knew little about what you were doing. Even in Nebraska your great work has been unappreciated. Presently along comes a novice who blurts out the statement that "Nebraska raises more apples than the state of Washington," and you get more notoriety in the newspapers than you have received in forty years; why? the first step has been accomplished; the attention of the public is attracted.

A period of nearly a year elapses and the statement is repeated in slightly different form; this time it is: "Nebraska raises more apples than the whole Pacific Northwest." The newspapers begin to sit up and take notice; critics rebuke the presumptive ignorance of the apple boomer, but investigation shows that Nebraska has the goods and the public interest is awakened; step the second is accomplished. It is up to the horticulturists of Nebraska to close the deal and complete the cycle of successful advertising.

Now, I have related this with some hesitancy, having been somewhat intimately connected with the incidents in question; anybody else could have done it just as well; many could have done it better; the only trouble was that they lacked nerve sufficient to breast the tide of public opinion which has been setting strongly toward untried ventures in fields afar and they lacked belief in the future of Nebraska. I have a belief which amounts to an obsession; it is this: The man who does not believe in his own country is not likely to make a good citizen of that country. When I cease to have faith unbounded in Nebraska I will leave Nebraska and seek some country in which I can have faith and for which I can work with a free mind and conscience.

It seems to me that we have now reached the point in the partial development of the orchard industry in this state where the market has been established or created for us, very largely by the agency of our friends of the Northwest, who have come in here and by their splendid apples have awakened the public appetite to the point where they are ready to buy fruit, and buy that which we are offering at this time in this state, and that will be stimulated by the exhibition across the street, and should be taken advantage of at this time.

It seems to me one of the most inconsistent things my friends, in the economy of business in this country, that we keep producing things here, but go over to another country, and bring their stuff over here and we

at the same time are producing better stuff than we get up there, and pay the freight both ways. Pardon me just a moment, while I refresh your recollection on that. There is an old economic theory that has been expounded a good deal, that the most prosperous nation is that nation that exports its goods to some other nation and gets money in exchange for it. I want to tell you something, and that is, that out of the ninety millions of people in the United States, there are nine million of them that are going to bed every night without their supper. I have a theory, and I believe it is economically sound, and it is this, that that nation is the most prosperous which uses its productions to make fat its own people. If that is true of the nation, it should be true of the state and community, and a whole lot of this high cost of living that is complained about; and a whole lot of the complained of high cost of transportation, and a whole lot of this stuff, is simply due to a misapprehension of the real state of facts.

If we unite our energies on the things we have in our midst, and supply the market at hand, instead of being anxious to sell apples in London and Liverpool, and so forth, but show them that we can sell the best apples in the world right here in Omaha and Lincoln and our own state, then we would have arrived at the best part of this whole industry.

Of course there are a great many things we have to contend with. I understand that they can ship their apples from Rochester, New York, to North Platte, Nebraska, in carload lots, for twenty-seven cents a hundred, and that is less than you can ship from Richardson county to North Platte. But that is one of the things we must look out for, and nobody knows how this came about, even the men who make the rates. The best thing to do is to get together. There is only one way in the world in which men can get together, and that is to get together. They can not get together by standing off and criticising each other. They can not get together by trying to slough off some proposition onto the other fellow to his personal disadvantage. Producers of this community will never get together until they get together on the basis of mutual profit and fair dealing. I happened to be in Omaha the other day when the state lumbermen's convention was in session. They did not have any trouble to get together. You will go around to a lumber yard in Lincoln to get a bill of lumber filled and then go to a dozen of them and get their figures, and then check up, and you will find those fellows have no trouble in getting together, and we will have trouble in getting together until we get together on a basis of mutual confidence for mutual profit.

WHY ADVERTISE THE APPLE?

Why advertise the apple? Why not be content to pursue the even tenor of our way undisturbed by the flood of advertising such as characterizes less favored sections than ours? In the first place, the development of Nebraska orchards has now reached the point where profitable

marketing should begin; the demand of our cities for good fruit has been stimulated by the beautifully packed and artfully displayed product sent from the Northwest until apples instead of selling by the bushel or the barrel as once was common, now sell by the dozen. The demand is here; whether we shall meet that demand with a supply which will take its rightful place in our home market is up to the growers of Nebraska.

In the second place, we should advertise the apple in order to justify the faith which has induced the pioneers to plant these orchards and keep up this splendid society with its great educational work for nearly a half century. The effort and money which you have put into this enterprise may be fairly reckoned as an investment which is now about ready to pay dividends. How much is an apple tree worth after you have brought it to bearing age? Shall we say ten dollars,—a sum at which most of you would scoff as miserably insufficient, but even at the valuation of ten dollars, the apple trees of Nebraska represent a capitalization of nearly eighty millions of dollars. We should look to our dividends.

Legitimate advertising through the channels of publicity should now be seriously undertaken for the further reason that an unusual opportunity exists to reap advantages from the preliminary advertising which has been done by our friends of other sections; this advertising they have paid for, but a large measure of the profits will be ours if we seize the opportunity.

Now I trust that the hearer will not assume that I am advocating a campaign of booming for the apple or for the inauguration of a craze for speculation in the undeveloped orchard lands of this state. There is danger that this may come as a result of some of the successes in Nebraska orcharding; it has characterized much of the development of the Northwest, and we will be fortunate if we escape its baneful influence. The particular thing which I desire and which I believe that public sentiment is reflected in that it should be possible for the consumer to go into the market in Omaha or Lincoln, and buy Nebraska grown fruit under its own name in open competition, with such as we are now compelled to buy because the packer buys your apples at the orchard and ships them east. There is scarcely a day in which some person does not ask me, "Why can't I get Nebraska apples on the market of the quality which you have been writing about in the newspapers?" You growers know why, they can not get them. It's your job to remedy this condition, unless you prefer the eastern market to the home market.

And this brings me logically to the next thing,—the organization for marketing:

One can not blame the grower for getting the best price for his crop but it should be evident by this time that the Northwest has great advantage in its excellent marketing organization. They have learned out there that it is easier and more profitable for the community to stand together and operate co-operatively alone than take their individual chance with the buyer; we will have to reach this position in Nebraska before

orcharding is firmly established as a paying business for the average man. While the grower of experience who is operating a large acreage can possibly find for himself he would have nothing to lose by co-operating with his neighbors. The present vogue of the western apple is due to two important factors:—uniformity of quality and pack and widespread advertising; both of these have been secured through co-operation.

With the manifest superiority of the Nebraska apple, it ought to be a simple thing to occupy the home market, but go out in Lincoln or Omaha and look for the Nebraska apples. You will not find the sort that are on exhibition in the show yonder. Why not? Because the Nebraska growers simply have failed to co-operate in the establishing of modern methods not only in the growing of the crop, but in the marketing of it, as well. It is encouraging to know that this subject is already under discussion in this meeting and that prospects are favorable for a strong co-operative organization among Nebraska fruit growers. The people of our cities are entitled to the first chance at the home grown fruit; you are entitled to the first chance at the home market; the responsibility for meeting this condition rests primarily on the grower and until he rises to his opportunity, we will continue to find our markets flooded with western fruit.

A HINT AS TO ADVERTISING.

I have been asked to touch briefly the matter of concrete advertising for the benefit of the nurseryman; what applies to his business will apply to any other; do your advertising in papers of proven circulation and pulling power. Farm paper advertising is now ranked by experts as the most valuable for such lines as appeal directly to the farmer: high grade farm papers gets a higher rate for their space than the daily newspapers. Here's a hint as to the ultimate value of such advertising:

There are plenty of farm papers; their name is legion. Not all of them are highly valuable to the advertiser for at least one reason which seems to me to be well founded.

Many of these papers, and among these some of the most prominent, have an arrangement with the local bank, department store, grain elevator, or postoffice through which the farmer gets the paper for a year at from one-fourth to one-half price; sometimes he gets it as a gift through the "liberality" of his banker or grain dealer. "Beware of the Greeks bearing gifts." A man does not think a whole lot of a paper which he does not think enough of to pay for and renew voluntarily. The value which attaches to an advertisement depends largely on the value which it appears.

If I were to place a line of advertising in a farm paper, I should endeavor to select such papers as occupied the field with a bona fide paid circulation which was built on merit without special premiums or gift

enterprises. I am of the opinion that the advertiser who places his contract with such publications will receive the best returns.

I have thus briefly and hurriedly rambled over the field suggested by advertising the apple. My experience indicates that that large company of cheerful boosters who are to be found in the newspaper profession in this state are willing to do their part in letting the world know the superior quality of Nebraska fruit. They must rely on us who are interested for their facts. Get the facts to them in reliable form and you may depend on them to do the rest. Nebraska orchardists can get publicity which could not be bought with hundreds of thousands of dollars if they will get into the game properly and keep it up; but they will have to ensure the quality and uniformity of their product and put it on the market in condition to compete with the growers of other sections.

It is evident from the exhibit now installed at the Nebraska apple show that it is possible for the Nebraska grower to produce the quality, the pack and to occupy the home market; whether he will do this depends on himself.

The Chairman: Is there any discussion on this paper by Mr. Odell. If not we will continue with the reading of the questions in the question box.

QUESTION BOX.

The secretary reads the second question as follows: "How does summer pruning compare with winter pruning on bearing apple trees?"

The Chairman: Has there any one had any experience along that line; if they have let them tell it. I remember when I was a boy in Illinois they used to prune the apple trees when they were in bloom, but I do not know anything about the results.

Some one in the audience: As a stranger here I have enjoyed myself very much this afternoon and I see that you are at the point of the question box, and I would ask the privilege of asking a question. I think it will be somewhat in harmony with your meeting here. I will state that some three years ago I bought the Helena Fruit Farm, six miles from Omaha, and it has pretty nearly killed me, and I want some one to tell me something about some way to get relief.

Mr. Pollard: In answer to the last question on pruning I will say this: It will depend what you are pruning for. If you are pruning to thin out your trees in winter, it will produce a tremendous growth of wood. If you prune in the summer, in July, it will give a check to the growth of the wood. That is the difference that we have found in our experience. If you wish to trim the tree for fruit, trim it in the summer, and if you wish to trim it for growth, trim it in the winter.

Mr. Christy: I have found where we trim in the winter they heal over better than our summer pruning.

Mr. Pollard: No, they will crack through. The fruit buds are formed in July, and if you trim before then you will regret it. The theory is

that we are commanded to go forth and glorify and replenish the earth. The trees have the same command to them, and they go forth and glorify. Let a gopher get underneath and cut off its roots, and if that tree has never had a crop, it will have one then. It seems to me to be scared, and to do something before it dies seems to be what it wants to do. Trees that have not been bearing all their lives, if you will trim them thoroughly, they will bear all right the next season.

The secretary reads the next question as follows: "What advantage has the cut-away harrow over the common disc in orchard cultivation?"

Mr. C. G. Marshall: We have had quite a little experience with orchard cultivation with discs, the last few years, since we have been leasing orchards, and we are using the extension reversible orchard disc, the ordinary round disc harrow, and although the cut-away has been recommended to us, I can not see that we could improve much over the other disc. We found that if we have it sharp we can drag up a stiff blue grass sod. And it does the work very nicely. One team of horses will drag one of these discs along all right, and by cultivating after a good heavy rain, you can establish a good soil mulch.

Mr. Christy: They claim that the cut-away disc will go deeper, but I do not know that that makes any difference, because I think this goes deep enough.

The secretary reads question number "4" as follows: "Can the English walnut be grown in Nebraska?"

Mr. Pollard: I have some ten trees of English walnut that have been planted sixteen or seventeen years. They grow up every year, and make a magnificent growth and freeze down every winter.

Mr. Yeager: A couple of years ago I found some growing in Dodge county, and I thought I had made a discovery and I kept track of them, and found they did the same way that Mr. Pollard's did.

A Member: I would like to ask Mr. Christy if he knows what Judge Stull's results were in his experiment of putting out English walnuts.

A. It was a failure.

A Member: Well, a certain form of the English walnut is grown successfully in New York. It is called the Pomroy walnut. It started there from a visitor from New York at the Philadelphia Exposition, who found an old tree in Philadelphia growing in the house in which he stayed during the fair, and he gathered some of the walnuts and took them to Rochester, New York, and planted them there. They have grown and multiplied and have planted around there in various places and seem to be doing well. And now I believe they are offering them for sale. It seems to be a rather hardy form.

The secretary reads question number 5 as follows: "Might it not be practical to consider the employment of the larger scholars in our schools with the consent of school authorities and the scholars in horticultural work to receive educational credit for such, in addition to wages.

Mr. Williams: That question has been somewhat near to me, and I can not discuss it quite in the form that it is given there but it is closely related to this question, what I call "bread and butter education." From the point of the fruit grower and the children of our public schools, there should be some means devised for bringing them together. Now for instance, just to illustrate my point of view: Last fall, during my grape harvest, I found it difficult to get grape pickers. After school began it was very difficult to get pickers enough to harvest my crop as fast as I wanted. I had a number of students who went to high school and as soon as school began they quit, and the same in strawberry season. The strawberry comes in just before the close of the high school, and I found it difficult to get berry pickers, and I asked concerning the idea two years ago, to let school out earlier in order to give us relief. And this question that is raised here is closely related to that, and it occurs to me if our high school educators should allow their pupils to take credits for some line of work like that, it would give us the relief we need, and be right along the line of a practical education for more students and let them know whether or not they want to pursue that industry or not. The present trend of our education is so intensive in getting a classical education that it is impossible to divert them from that course in spite of the effort that is made on the part of the agricultural educators. Our public school education does not affiliate with the needs of the fruit growers and gardeners. We can not get the help from them we need, and that is the long and short of it.

The Chairman: Remember the banquet at the Lincoln hotel this evening, in honor of Dr. Bessey. That banquet is served at 6:15 or 6:30, I think. Now, Dr. Billings, I can give you about five minutes.

Dr. A. S. Billings: The question I had was somewhat answered in part. I wanted to find out as much as I could what had been done, and what was being done in the way of the producing and growing of nuts. I have made a start in that way myself, and in inquiring around I have not heard of any instance of the growth of them only on the Morton farm in Nebraska City. There are some grown in New York and I have some of them that I am going to put out in the spring, the same nut that the gentleman spoke of. One man has fifty acres of nuts. I am at work putting out butternuts, English walnuts, chestnuts and filberts and anything else that I can get. I wanted to find out what had been done along that line. There is one word more outside of that and I want to thank these gentlemen here for having helped me very, very much. As I said, I bought the Helene Fruit Farm and I have fifty acres of fruit, and in the last three years it has pretty nearly killed me. All I knew about it was what I found out as a boy in Vermont. Every time I saw a piece of fruit I wanted it, and I bit off more than I could chew when I got 50 acres.

I had some very handsome raspberry vines and they did not seem to produce anything and I had made up my mind that the best thing that could be done was to get rid of them. And one day during the

summer these slips came from the government, and my foreman told me they did not amount to anything, but I got a little slip one day and it stated that the berry should be pruned soon after the bearing, and there were two prunings, so I thought it would be a good thing to do to cut them down 18 inches to two feet. I had a blackberry vine 14 feet long, and I thought it was pretty nearly like slaughtering it, but I had the courage to go and cut off all but three feet of it; that was quite a little time after the berries had been ripe though. The result was that I have some beautiful vines there, and they have grown from six inches to two feet, and it looked to me as if this trimming at that time was going to give me some fruit. I do not know how I am coming out but your speaking about the time of trimming, that one time would make wood, and the next time would make fruit, struck me as about the best I have yet heard. In regard to the nuts, I have been using considerable dynamite. I am blowing out all the old peach trees, and making holes about four or five feet deep, and five feet wide, and I have been catching all the water and snow, and I will set out nut trees the next year. I want to thank you gentlemen for the information you have given me, and for your indulgence in listening to me for what I have had to say.

It now being 5 o'clock p.m., January 22, 1913, the meeting of the society adjourned until 9 o'clock the following morning, to take up the program arranged for that time.

FORENOON SESSION.

9:30 a.m., January 23d.

The meeting of the society convened, pursuant to adjournment, and the following proceedings were had and done.

The meeting will now come to order, and we will hear the first number on the program, a paper by E. H. Herminghaus of Lincoln on "The Missouri Botanical Garden."

THE MISSOURI BOTANICAL GARDEN.

E. H. Herminghaus, Lincoln.

The Missouri Botanical Garden, popularly known as Shaw's Garden, owes its origin, development, and permanent endowment to the love of plants of the late Henry Shaw, a native of England and a benefactor of America. Its purpose is to afford restful recreation, education, and productive research. To accomplish this end, the garden has always been open to the public. Even from the outset, when it was a private estate, the public was permitted to share in the refining influence of flowers. The garden is open on week days from 7 in the morning until sunset and upon Sundays from May 1st until November 1st, from 2:00 p. m. until sunset. The garden is closed only on holidays. Another

method of disseminating botanical knowledge used by the garden, is by means of floral shows, the principal one being the chrysanthemum show which is held in early November. There are also the cyclamen and lily shows.

When Henry Shaw died, he left nearly all of his estate to the endowment of the garden, under the care of the board of trustees, fifteen in number. The value of the estate is estimated at about \$3,000,000 and it consists mainly of real estate. The interest is alone sufficient to maintain the garden. Part of this money is used in scientific research and the rest, which is the greater part, in gardening proper. The garden maintains a staff of three to five botanists, one of whom is the director of the garden. Five fellowships are granted to young botanists of prominence in order that they may make advanced research in botany and horticulture. The work and results of this scientific staff is published in the annual report of the garden. The gardening work proper is under the supervision of an able foreman who is aided by seven subforemen, each one having charge of a department.

Mr. Shaw's purpose to provide pleasure with incidental instruction to the public, to train gardeners and disseminate botanical and horticultural knowledge has led to and necessitated a large collection of plants representing 12,000 species. A library and herbarium were also needed. The library at present is the greatest of its kind in the world and contains about 100,000 volumes of botanical knowledge valued at \$110,000,000. The herbarium contains 680,000 specimens and is valued at \$100,000. The area of the garden is 110 acres, 60 acres of which is undeveloped. There are a number of plant houses each devoted to a special class of plants. The new range which is now under construction will have a frontage of nearly 400 feet and one section will have a height of 60 feet to take care of the tall growing palms and musas.

It will be the purpose of the rest of this paper to treat with horticulture at the garden and this resolves itself into a discussion of plants. I will speak briefly of the greenhouse plants, bedding plants, trees, shrubs, perennials and water plants.

At present the main house of the garden is devoted to plants requiring only moderate temperature in winter. In this house is the *Monstera deliciosa* which grows up on the wall to the glass. Most people marvel at this plant owing to the fact that they think it is an air plant, but its roots are under the bench. The Musas or bananas are extremely tall growing plants and will grow as high as any greenhouse is built. Here one can also find beautiful specimens of the *Rhapis flabelli-formis* and the *Livistonia chenensis* which we call *Latania Barbonica*. This house has also been used for display of flowering plants. In winter the Azaleas, Cyclamens, Cinerarias and Primulas are exhibited. These are followed by the lilies. In the spring an excellent collection of Torenia, Hydrangea, Fuchsia and Gloxinias is shown. When I saw these beautiful flowers I wondered why the florists of Nebraska did not use or make more use of these plants, especially Gloxinias and Fuchsias. Following these

a very good collection of variegated *Caladiums* was shown. In late summer an exhibit was made of the spider lily, *Hymenocallis littoralis*. These were grown in boxes 1 foot by 1.5 foot square and 1.5 foot deep. Passing from this house we enter the *Agave* and *Aloe* house. These plants do not afford much interest except at time of flowering when they send up a flower stalk 6 to 10 feet high with a spike of numerous flowers. The *Cactus* and *Yucca* houses do not afford much interest although there are some excellent specimens of the *Echino-cactus*. The *Acacia* house contains in the main three *Acacias*, a leguminous plant of the tropics. These trees which were about eight or ten feet high were one mass of bloom in the spring. Next in line is the *Bromeliad* house. This house contains the octopus plant, *Tillandsia balbisiana*, and the most interesting goose plant, *Aristolochia gigas*, which however, is not a bromeliad. This flower is about the size of one's head, provided that head is not exceeding ordinary proportions. The next house is the orchid house and perhaps is the most interesting house for the orchids are the most beautiful of all plants. Here I found that *Cattleya triana* was perhaps the most beautiful and best adapted for commerce, although *Chysis* the wax orchid, *Dendrodiums*, *Oncidium papilio*, the butterfly orchid, and *cyprisediums* the slipper orchids, are also adapted for commerce. Next to the orchid house is the house for East India plants and here we find *Dieffenbachias*, *Cyanophylliums*, *Marantas*, *Orchids*, *Bromeliads* and ferns. In the fern house or dome one can see the tree ferns *Alsophyia* and *Cybodium*, stag horn fern and numerous others. Adjoining the fern house is the cycad house and there are many who think that cycads are ferns. Here we find the old reliable sago palm, *Cycas revoluta*. Besides *Cycas*, there is *Zamia*, *Dioon* and *Eucephaiartos*. The *dioons* are beautiful plants and should be used more by florists.

The bedding plants used at the garden can be classified into two groups; the herbaceous or non-tropical and the tropical or woody plants. The herbaceous bedding plants are used in the parterre, a large sunken garden, and in the circle, a large group of beds of arched shape. The parterre and some of the other beds are planted with bulbs in the fall. In early spring a stupendous show of thousands of bulbs crop out of the ground. They are mostly tulips and from fifteen to twenty of the principal varieties are used. After flowering they are taken up and the summer bedding plants take their place. Their best bedding plants are, *Iresine*, *Coleums*, *Piquenia*, *Ageretum*, *Salvia*, *Begonia*, *Crotons*, *Cordyline* and *Pandanus*. *Tresine herbsti* brilliantissima and *coleus* "South part beauty" make the finest combination that I have ever seen. The former is a brilliant red and the latter a rich yellow. There was not a single bed of geraniums used and *cannas* were not used extensively. The *cannas* were bothered very much by the caterpillar. *Canuaurea gymnocarpa* received its last trial and will be abandoned for not making a good stand. The principal grasses used were *Penasetum* and *Panicum plicatum variegatum*, the latter making a close stand and of medium height. For early and semi-summer bedding work, stocks, poppies (*Papaver somniferum*),

were used to good advantage and they made a splendid showing. Excellent results were attained with Zinnias and Asters in ornamental bedding work.

Very good results were obtained in using such plants as palms, tropicals, rubber plants and agaves. These beds were much larger than the ones in the parterre and one at the side, where they made great foliage masses. The tropical plants were divided into different groups, as medicinal poisons, oils, perfumes, etc. Two magnificent beds were made with the rubber plants, with their large glossy leaves. Good effects were attained with Agaves, the largest plants being in the rear, the smallest ones in the front, thus giving a graduation in size. Some cacti make good beds while others are too ragged and shapeless. The best bed of tropical plants was one which bordered one of the greenhouses. It was composed of Manihot palmata (Tapioca plant), pomegranats (Punica granata), in the rear, with a Cassia and Lagerstroemias in the front. The rear plants were for foliage and the anterior plants were flowering, the cassia having yellow flowers and the Lagerstroemias red and white. All of the plants used in the above manner are only plunged in the ground.

My first impression of the trees in the garden was that there wasn't any tree that we can grow that they can not, but there were a number that they could grow to perfection that we could not. The garden was once rich in conifers, but the smoke had told the tale. Quite a factory district has been built up near the garden and the smoke has greatly affected the conifers, although the tsugas and bald cypress seem to be doing quite well. The soot in the smoke lodges in the sunken breathing pores of the pines and thus suffocates them. Smoke consumers do away with the soot, but they do not eradicate the SO_2 gas which dissolves in the dew on the plant and forms sulphuric acid. Among the deciduous trees there are the magnolias, sweet gums, horse chestnuts, buckeyes, beech, cladrastis, a yellow wood, sassafras, silver bell and bladder nut and ginko which are not familiar to us; at least we can not grow them successfully. Beech, liquid-amber or sweet gum and the buckeyes are the most beautiful trees owing to color and form. I was disappointed with magnolias when in flower. The flowers were beautiful but the mass of them lack effect in the absence of foliage.

As it was with trees so it is with shrubs; namely, many shrubs do well there that do not do well here. This is especially true of roses. Roses thrive better there as the climate is not as dry as here and you will find that they still do better in the east. If you go a step farther, they thrive much better in England, where they have 60 inches of rainfall, than in any place in the United States with the possible exception of California and Oregon. I found that "Grusz and Tepitz" was perhaps the most glorious of all the varieties at the garden. Clothilde soupert is a good border rose. Maden, Charles Wood and George Washington also do splendidly at that place. The evergreen shrubs such as rhododendron, azalia, kalmia, and conton-caster are not a great success, and I would only pronounce them fair for that locality. Of the deciduous shrubs none

does better than *Berberis thunbergii*. This shrub is to them as the spirea *Van Houtii* is to us. The viburnums, such as *dendatum*, *lentago*, *lantana*, and *apulus* are splendid shrubs there and they are becoming to be the best ones here. Spirea *Van Houtii* does not amount to much there but *douglasii* and *salicifolia* are fine. The *loniceræ* are no better there than ours but the *hydrangeas* are great, especially *hydrangea arborescens grandiflora*. California is the best of the privets and is extensively used as it does not winter kill there very often. The lilacs are not to be compared with ours and here is one of the things that we excel them in although the bedding plants at the farm looked better to me than those of the garden. *Lindera benzoin*, *Deutzias*, fringe tree, matrimony vine and sumach do fine at the garden although the sumachs are very subject to the ravages of smoke.

The perennials of the garden are about on a par perhaps a little better than ours. I was told that they had not been mulched but the new foreman told me that they would be in the future. Here again we come to an instance where we excel them and that is in hollyhocks. Their specimens are shameful alongside of ours. The collection of peonies is large and it is one confusion of varieties as all collections of peonies are. *Crinum*s, golden glows, *campanulas*, sunflowers and *sedums* are among the best of the perennials at the garden.

To me the water plants were the most interesting as I had never seen them here and then I wondered why I had not. There are two groups of aquatics; the hardy and the tender ones. The tender ones are grown in the cement basins and include such plants as *Nymphaeas*, *Victorias*, *Acorus*, *Pistia*, *Eichornia*, *Thallia*, *Euralye*, and *Cyperi*. The *Nymphaeas* are most beautiful in flower while the *Victorias*, *Eurayies*, *Pistias* and the *Acorus* are beautiful for their foliage. *Pistia*, which is water lettuce, looks much like lettuce and it makes a compact low growth. The grandest of all water plants is the *Victoria regia*. The leaves of this plant attain the size of 4 to 5 feet within a week and one of them is capable of supporting 350 pounds. The flower is white the first day, red the second and a purple red the last day. *Eurayle* also has large leaves but they do not turn up at the edges as *Victorias* and they are covered with large warts or horns.

Among the hardy water plants, *Nelumbrium lutea* is the best. I could do no better than describe the hardy pond at the garden that I would so like to see imitated or attempted at the farm. The surface of the water was covered with *Marsilia*, a little clover-leaved fern, and with *Potomuge-tans fluitans* whose leaves resemble *Nymphaeas* but are much smaller, at one side above the water. In mid-summer this group also exhibited a glory show of gorgeous yellow flowers. Around the edges were tall growing water plants such as cattails, *Scripus*, *Thallia*, *Acorus* and *Sagitaria*. These tall aquatics flanked the sides and formed a frame for the picture. All of these plants are native to North America and are perfectly hardy. Why would they not do here?

In conclusion, I think that a Nebraska botanical garden would be of as great a value to Nebraska as the Missouri botanical garden is to Missouri.

Why not educate the people of Nebraska to the refining influence of flowers as that garden has to the people of Missouri. It would be of great value to the horticulturists of this states as a great number of plants could be tested for our conditions, and surely some of the beautiful and useful plants found at Shaw's garden will also do well here. It would be also an aid to you in that the plants would be scientifically and properly classified and you as well as everybody else could use it for comparison. The place for such a garden is at the farm where there is now a nucleus of one at the present time. In the end I can not conceive of anything that would be of greater value to horticulture of Nebraska than a Nebraska botanical garden.

DISCUSSION.

Mr. G. A. Marshall: We have a gentleman here in the meeting who I think is a member of this association and if he is not, we will pick his pockets until we make him one. I know he is interested in this paper because his head kept going back and forth, and I know he has some information for us, and I think now is a good time to ask him to give us a little discussion on this paper. I will call on Mr. Peters of Omaha.

Mr. Peters: What I do not know would fill a pretty large book, and what I do know would fill a very small one. I am interested in flowers, however, and always have been, and I think the time is coming now, when the perennial plants, the newer perennials are going to be planted much more than in the past. This is a new country, and the people have been trying to make money. Self-preservation is the first thing. After that come the arts; and really landscape gardening and flowers come after pictures. And that is an art beyond the ability of a painter of pictures. Take the old countries, the landscape gardening was one of their last ventures, I believe. As well as in the southern part of Europe or England. The eastern part of the United States is today doing this quite extensively. We begin it here, and you horticultural men can do nothing better than to develop a taste for this class of work. It beautifies the country. "Father" Harrison is right when he says, "beauty is wealth." You want the people to fill your cities and farms and counties. You do not want people that have money only,—of course you want them too, but you want to make a beautiful place for all to live in. You want to get the cultivated class, that is what makes a desirable community of people, people who have something else in their minds besides the making of the dollars. To my mind this is one of the finest things in the world. Some of those boxes of apples over in the show room are as beautiful as any bouquet you could make. But some of the boxes were a little irregular and some of the apples were a little rotten, and that spoils the bouquet. You must take these out every morning. When the eyes of the people are pleased, you can interest them, and when the eyes are not pleased, you can not interest them. So that reverts back to the beauty of apples, and if you please the eye of the visitor you please the visitor, and you may get him as a resident of your county or city, and I would like to see this society as was proposed yesterday, make up a little list of plants that are

hardy and will grow well, and get the farmer interested in beautifying his place as well as making it a money factory. And you will have a much more beautiful state and a much more pleasing spot to live in.

The Chairman: I wish to say to Mr. Peters that years ago the State Horticultural Society commenced collecting knowledge along this line and we have a list now that covers two or three pages in our report. They are recommended in connection with our fruit lists. The same care has been taken in making this list as has been in our fruit lists. Perhaps not quite so extensive but we have a list now covering perhaps 75 to 100 different varieties of shrubs and plants and perennials. Of course the list varies with the section of the state.

Mr. Peters: There is one thing I would like to add: I would like to see this show held in Omaha. Instead of putting in the number of apples you have here, put in twice as many. I am not disparaging what you have here, but put in a bigger one, and put in a big display of flowers so that when the ladies visit this show they will go down through this line, and be pleased. If you put in a big floral display at the same time with your apple show you are bound to have more ladies there. Then put in 500 barrels of apples if necessary, and then let a lot of people that buy only northwestern apples see them.

Mr. VanHouten: I approve of the remarks that have been made by Mr. Peters, but there is another side of the question. I have had to do with fruit displays and state fairs and horticultural meetings for a great many years, and I have found by experience and wider observation, that the men who do that, do it at considerable sacrifice. Now it would be very nice indeed for them, if it were possible to have twice as much fruit as we have here now, but we have a wonderful collection and a very large one right here. Now if you go to Omaha, and if the people of Omaha will do their share, then they may be sure that the horticulturists will do theirs, but it is too much to ask a man to take a fruit display at a very large sacrifice and then give it away to somebody else who is going to profit by this just as much as he is himself. And the city bidding for this should put up a financial guarantee so that the show will not be a failure. I speak of this because I have been through it so many times, and I just want to suggest that the horticulturists should not be expected to assume this great burden, but the people of the city where it is held should put up a part of the money, and not expect the men to come and bring all their fruit and bring money, and help advertise the business for a man who will make just as much profit out of it as he will himself. You had better sell the apples on the market. I am just speaking of this to represent the other side of this question and not to criticise Mr. Peters, but to show the necessity of cooperation. If a city wants this show they should contribute something to it, and there should be something of a rivalry between the cities. And then I will guarantee that the horticulturists will be there at the show, and the ones that have been giving things, and the ones that have the most fruit there will do the most.

Mr. Peters: I do not think but what you are quite right, and if Omaha will not do its fair share, don't put your show on at Omaha. The

Commercial club will do their part of the business. I am only one of a great many people there, and I want them to do the right thing, and if they will not do their share don't you put your show on there.

The Chairman: If there are no further remarks, we will pass to the next number. I notice we are booked for a discussion on "Apple Packages" a matter which is very practical and of very great interest to this society. This is to be led by Professor Laurenz Green, of Ames, Iowa.

APPLE PACKAGES—DISCUSSION.

Professor Laurenz Green, Ames, Iowa.

Mr. Chairman, Members of the Horticultural Society: We have been discussing apple packages quite a good deal over at the apple display, instead of trying to learn to pack apples in boxes. What seems to be the main question is will it pay to pack in boxes, and what advantages have they over the barrel? There are other methods of packing besides the barrel and the box. We found this winter that a small paper carton put out by some of the paper companies paid us well for the trouble of buying it. It costs us between one and a half and two and a half cents apiece and holds a dozen apples. We found these sold well enough to repay us for the trouble of packing the apples. Another man who packs them this way started out using the parcels post delivery. Another man used baskets to pack his apples in. Now perhaps this discussion will end in the box and barrel. Anything less than the barrel should contain the best apples, because every time you decrease the size of the package you increase the cost of packing and marketing, you can not get away from that. They may talk about the box being cheaper than the barrel, but I don't believe that the man lives who can make it cheaper. When you increase the price of the apple on the market we are bound to decrease the demand for that product. And therefore we are going to cut off the consumption by the demand for the box, but there is a certain class of people who are bound to pay for quality, and they do not want these apples in barrels where they can not see and do not know what they are getting. But the box has its place. In fact I favor the box a great deal, but the principle is true that every time you increase the cost of the apple, you are decreasing the demand, and decreasing the consumption. But there is another side to that, and that is that in the city you can reach the small consumer who can not use a barrel of apples. The residents in most of the small towns, and the farmers buy the barrel, or two or three barrels, of apples, but in the city in the flats, they have no place to keep a barrel and they buy smaller quantities and thus by the box you reach the small consumer. I was interested this fall to note in the newspapers quite a discussion among some of the western growers of the northwestern country, in regard to the apple barrel, and a great many of them are using the apple barrel to market their apples. I do not believe I have anything more to offer on this question. I wish the discussion would be free and open.

The Chairman: The matter is open for discussion.

Mr. C. G. Marshall: I will say that I have had some experience in packing both in barrels and boxes. A year or two ago I thought that the box would probably be the only package, in a few years used in this country, but I am changing my mind. I believe there is a place for both packages just as Mr. Green has said, but the box package we find has been rather expensive. Of course after we get our men trained in packing so that they can put up more packages in a day we can lessen this cost. We have found it has cost us 10 to 12 cents a box for the packing of these boxes, and then an expense of 2 or 3 cents for paper, and we have had to use the very best apples for the boxes, and in the long run I believe we were ahead from the apples we packed in barrels. Now that box package would be desirable to pack our best fruit in; some of the fancy varieties, that can be disposed of to the best trade in the city, but in the case of the ordinary Ben Davis and some of those apples that are used mostly in the culinary department, I doubt if it will ever pay to put it up in that way. It demands a price too large to expect the ordinary consumer to pay for.

The Chairman: Is there anything else?

A Member: My observation has been that the people here have thought altogether too much of the box. It has been accepted as a cure-all for low prices, and with the increased use of the box as an apple package we are beginning to find that the northwestern people are right when they pack only their very best fruit in the box. Now we all hear a very great deal of Hood River. What do the people there pack in their boxes? Nothing but the very best. And then they are extremely careful to have every apple in the box just the same as every other apple. I was down in Arkansas and saw a man whom I heard was the most progressive grower engaged in the box packing of apples in Arkansas, and I called to get an idea of what he was doing; he wanted to get the cream of the prices. A lot of the apples he was putting in his boxes were spotted and bad, and scale marked and a large part of them were being turned down, and yet he was going on the assumption that putting those apples in the boxes would bring him a big price. Now as a matter of fact 50 per cent of those apples that he was packing in boxes should have gone in barrels. Why? Because it costs more to pack apples in boxes than barrels. It will cost 20 cents more to pack three bushels in boxes than in barrels. And on account of the increased cost of the box as a package, nothing but the very best sample, the cream of the fruit, should go in boxes to make the box package pay. It is the cheaper grade of apples that should go in barrels, and when it comes to the stuff we are hesitating about, I am of the opinion it should go to the evaporators, the vinegar factory, and so forth, and not go on the market at all. The evaporators are gaining in popularity as an outlet for low grade stuff. In Missouri, New York, Oregon and California the evaporators are taking the poorer grade apples and are using them and converting them into a by product, and thus it takes the low grade stuff off the market and increases the price of the market apples. The northwestern apples in Washington, Oregon, and so

forth, have not made use of the by product and the result is increase of output, and the northwest apples although they increase they do not get the price they should for their high grade fruit. When it comes to the package, the barrel certainly has a great big place here in this country and will always have.

Mr. Green: Some of you men have been asking about Delicious apples, and I want to bring that up in connection with this matter of package, because it will serve as an illustration. I opened up a barrel of Delicious shipped me by the grower in eastern Iowa, who is very careful in his methods of packing. I know he had given it the very best of care, and it had been in storage for three or four months, and I opened it up and 25 per cent of those were bruised and rotted, and could not be handled. The Delicious is a good keeper in a smaller package, and we must adapt these packages to other similar grades and kinds of apples that will carry better in smaller packages.

Mr. Cooper: We have been doing a great deal of packing in Kansas. At the station we have been doing a great deal of packing in boxes. Our most tender varieties we find will hold up better in boxes. We have been buying our boxes in carload lots, and we get those boxes in carload lots and find it costs but 10 cents apiece to pack this box. Well, the cost of packing in boxes comes up from 60 to 75 to sometimes 80 cents for three bushels, considering the cost of everything. While in barrel packing we paid from 35 to 37½ cents in carload lots. It costs about 25 to 30 cents to pack those, so that brought the cost of packing in barrels in from 60 to 80 cents. It does not cost as much to pack in barrels as it does in boxes. But when it comes to selling, we realize from 25 to 30 cents more on the boxed than we do on the barreled stuff.

At Parker, Snyder & Rodiger have 1,200 acres of apples. They have been getting better prices for their boxed stuff than the other. As Mr. Green suggested they are putting their best grades in boxes. They dispose of nothing at all in bulk except what they consider the cull apples, to be used for vinegar and such things as that. I think that is the way we will have to do in this state, to pack our best stuff in boxes to meet the demand of our smaller customers.

A Member: This year in a Colorado orchard, there was quite a large per cent of Jonathan apples, which were undersized, they ran below two inches and on that account could not be packed in the standard grades of the state. The grower packed these apples in half boxes and wrapped each apple just as we would have, had the apples been two and three-quarter and three-inch size. And they were packed in tiers, but instead of labeling those apples "Jonathan" he called them "Cherry Jonathan." The standard crates of Jonathan sold at a dollar and a half. And these half boxes so far have been selling for 65 cents; so he is ahead on a low grade apple. These Jonathans were absolutely perfect; they were beautiful little things, and the only trouble was the size, they were too small. A man of a family can buy a box of that sort and he gets a great deal more eating out of a box like that than a barrel, where he would have to throw away a large per cent of them.

Mr. Cooper: I would like to say this, that the size of the apple does not necessarily mean whether or not it is first or second class apple. We have of lots of apples that are not two and three inches, and if they are packed in these special packages make a very attractive grade, and they will command as large a price in the markets as any other pack. One kind of pack is bringing higher prices than others and they will bring larger prices than any other pack, no matter what size it is. So I think we had better confine ourselves to quality rather than to the size of the apple.

The Chairman: We passed one subject yesterday without a discussion, and that is a discussion on spraying, which is a matter we are perhaps more deeply interested in even than the package, and we will call this matter up and ask A. C. Marshall, if he is present, to lead the discussion on spraying. Mr. Marshall not seeming to be here, I will call on Mr. Duncan for some remarks on this subject.

SPRAYING DISCUSSION.

Mr. Duncan: We have been spraying now in a commercial way only the last three years, and we have been using arsenate of lead, and lime sulphur in our spraying. I think we started with lime sulphur, were the first ones in our town, and we used the first year, if I remember right, a preparation of 1 to 37½, but we found in our succeeding seasons that the weaker solution is better. We sprayed three or four times in the course of a year, and we found that the last three years there has not been any apple scabs to amount to anything. Of course in a dry year we have not had to spray for anything except the worms. We have about 135 acres under our control now, and we have some orchards that are pretty badly infected with codling moth. The first year, of course, it was an uphill job to control the codling moth, but this last season we sprayed three times only and we had so much other work we could not get our spraying done the first time over. We sprayed the calyx spray, that is just when the petals are falling. Ten or fifteen days later we gave it a combined spray. Now most of the people have advocated a combined spray at the time that the petals are falling. Well we find that a combined spray throughout the season has not injured our fruit in any way, and the trees seem to have a more vigorous and healthy foliage, and the foliage stays on the trees better. A big apple buyer was in our orchard last fall and after he came back from Kansas and Missouri, he said that the foliage in our orchard was the best and cleanest of any orchard he had been in. Now as to giving you the cost of spraying, and the percentages and such as that, I could not give you that, because I haven't the figures with me of any one of our orchards. We have six buyers from different sections, Chicago, and Minneapolis and different cities, and they said that was the cleanest bunch of apples they saw this fall, and when it came to culling for worms, I do not think we had to cull for any worms hardly at all. That seems to have been one of the greatest things, it has been with us any way in the last year.

Mr. Green: I do not want to enter into too many of these discussions but just one point Mr. Duncan brought out, that I would like to emphasize here. He spoke of diluting lime sulphur. Every fruit grower should have his hydrometer and test his solution before he uses it and go according to the hydrometer test. I believe that he will find that if he will spray for scab before he does his cluster bud spraying he will find less scab.

A Member: I would like to inquire about how many acres growers find it possible to handle with one spraying outfit. We had one machine and had about twenty acres in our home orchard, and could get over that just about right, and then we had ten acres in our other orchard, and by the time we got over that, we were a little too late and wonder if the machine was not large enough, or if we were too slow. Of course these trees were good sized, and about 25 years old.

Mr. Marshall: We have an orchard of about 1,000 trees that we have been spraying. We have to haul the water just a few rods. We dip it from a tank usually into the sprayer and we can put on from seven to ten loads a day, and it takes us about two or three days to spray this orchard. Sometimes we get over it a little quicker, but the second spraying we put in three good full days to spray them. Now maybe we are a little slow, but these trees are about twenty years old, and just ordinary sized trees.

Q. How large is your tank?

A. Two hundred-gallon tank.

Q. How many leads of hose do you use?

A. Three.

A Member: I would like to say that in our experience in this line, we have three different sized sprayers, and we are using 250, 200 and 150-gallon tanks. We figure we can get out five tanks a day of the 250-gallon size. We figure that the tank will cover, depending on the size of the trees, on an average, twenty to thirty trees to a 250-gallon tank. And we can get five or six tanks a day out. We, of course, are a little fortunate in having our water right in our orchard. We have a forty acre orchard in this particular instance. That has been our experience in the amount we can cover, and I should say one sprayer in every forty acres is a great plenty. You would not want more than forty acres to one sprayer to do any kind of a good job, and in fact thirty acres would be better for one sprayer.

Q. Do you think that a man can cover thirty acres in proper time?

A. Yes, sir, I think so.

A Member: It seems to me that if you can get over with one machine in proper time, it depends on what you are spraying for. When it comes to the first codling moth spraying, that is a hurry-up job. Your calyxes stay open just a day or so, and then you must spray while the calyxes are open. It seems to me that the number of acres that you can assume that that spraying machine can cover, any specific number of acres, depends largely on what you are spraying for, and the varieties.

Mr. Yager: All of the talks so far this morning, have been relative to commercial orchards. Now there are thousands of farmers in the state

that have home orchards of an average nature, just the average farm orchard, who is not able or willing to buy spraying machines of the 150-gallon capacity, or the 250-gallon capacity that Mr. Duncan spoke of, and I think we should give some consideration to the average farm orchard in talking about these spraying things. We are not all commercial orchardists. If we were, the country would be flooded with cheap orchardists, and we would have to go out of business, and go to raising corn and farm products. Now I wish somebody would tell why and what sort of a spraying machine, a cheap spraying machine, for instance a farmer who has 100 apple trees can use. He won't go and buy one of those great big machines, and he can not afford to. Now, I wish somebody would tell what sort of a little spraying machine, a farmer should have, an up-to-date farmer, who wants to raise fruit that is not wormy. What sort of a thing he should have for spraying. Who makes it and what it costs.

Mr. Duncan: Do you mean to have the name of the manufacturer or do you wish the price and such as that put on the record?

Mr. Yeager: Certainly, tell us who makes these things, and approximately what they cost.

A. Approximately, well, there are several. There are hand pumps that cost from \$5 to \$20, and there are hand pumps a little larger, and power pumps at from \$20 to \$75. These small ones would be suited to the man who has forty to fifty trees, and they will maintain a pressure of from 100 to 175 pounds, and the larger size will maintain as good a pressure as the power pumps costing \$200 to \$275. There are two or three companies, Morley & Morley of Benton Harbor, Mich., makes a good hand pump; the Myers Spray Pump Company, of Ashland, O., and the Deming Pump Company of Salem, O., also make good pumps. There are several horticultural papers that any growers can get this information in. They carry advertisements of these machines.

Roy E. Marshall: I had some experience with several hand pumps last summer, and the one that impressed me the most was the Myers pump with two cylinders, and that had a handle that we could push back and forth something like a washing machine, and with which we are able to get a pressure of from 150 to 200 pounds. We had two leads of hose on it, and it seems to me this type of sprayer answers the purpose of the small orchardists with up to 400 or 500 trees. We are able to cover from 125 to 150 trees a day, and where the water was hauled in a ten-barrel water tank, it was set in about the middle of the orchard. I do not know another pump we have had experience with that we could recommend so highly for what it has done for us.

The Chairman: The next number on our program is by Prof. Beach on "Pedigreed Nursery Stock."

PEDIGREED NURSERY STOCK.**Prof. S. A. Beach, Ames, Iowa.**

The pedigree question is being much discussed by some nurserymen and fruit growers.

What is there in it? Do plant pedigrees have the significance which some attach to them? Is it of any advantage to the fruit grower to set out pedigree strawberries, pedigree grapes, pedigree peaches or pedigree apples? Is there any such thing after all as a pedigree Baldwin apple or a pedigree Crescent strawberry, or a pedigree plant of any cultivated variety which is not propagated from seed?

Before entering upon the discussion of this question it is well to inquire what is the proper meaning or use of the word pedigree. This word has long been used by breeders of animals to signify a line of descent from known ancestors. In such a case each individual is joined by blood relationship to the two immediate parents and through them to the four grandparents, eight great grandparents, etc. There certainly can be no objection to a similar use of the word in speaking of plants. However, in the popular discussions by nurserymen and fruit growers above referred to the term plant pedigree is seldom used in this sense, but is usually applied to plants which have been derived from one original seedling plant by asexual propagation only, i. e. by scions, cuttings, etc. At first thought one might be inclined to question whether such use of the term pedigree is strictly accurate. The term "selected strain" would express the idea correctly. But it is not our purpose to enter into controversy over the meaning of these words. "A rose by any other name would smell as sweet." Let us rather examine the ideas for which they stand for the purpose of inquiring to what extent these ideas are supported by the facts.

Before entering upon the discussion of the subject before us it would be well to define some of the terms which we shall find it convenient to use. Reference has already been made to the fact that plants may be propagated by two methods, the sexual and the asexual.

The sexual method of reproduction results in the development of the seed. When the seed germinates it forms a new plant. The seed is formed as a result of the fertilization of that portion of the flower which is called the ovule or egg cell. If a flower from any of the common orchard trees were examined it would be seen to consist of (1) small green leaves on the outside or underside of the open flower called the calyx; these were the green outside leaves in the bud; (2) the showy leaves of the flower called individually petals or collectively the corolla; inside of the corolla are the essential organs of the flower. The calyx and the corolla are not essential organs because it is possible for the blossom to develop fruit even though these should be removed before it opens; (3) the stamen is a slender, thread-like organ at the outer extremity of which is a minute sac, commonly yellow. The sacs are filled with a powder consisting of minute grains called pollen grains; (4) the center of the flower is occu-

pied by the pistil or pistils which finally develop into the fruit. The tip of the pistil is soft and sticky so that it may catch and hold any of the pollen grains which happen to alight upon it. The transfer of the pollen to the pistil in this way is called pollination.

After pollination occurs the pollen grain germinates and sends out a sprout in a way analogous to that in which seed sprouts in a congenial soil. The sprout from the pollen grain grows down through the soft substance of the pistil till it reaches and fertilizes the egg cell. After fertilization occurs the egg cell develops into seed. Commonly if no fertilization takes place no seed is formed. Fertilization which is effected by pollen produced by the same flower as that which bears the pistil, or by the same plant, is called self-fertilization. It should be noticed in particular that in plants both the male and female parents are often united in one individual. That fertilization which is effected by pollen from another plant, or speaking of cultivated varieties, from another variety, is called cross-fertilization. Cross-fertilization is brought about under natural conditions by the transfer of pollen from one plant to another through the agency of winds or insect visitors.

By the asexual method of reproduction plants are propagated by cutting off or separating some part of the original plant such as bud, cutting, scion, runner, off-set, etc., and growing it as an individual plant. Cultivated varieties of fruit are commonly propagated asexually. In fact it is seldom that any of them are bred so that they will come true from seed even when the seed is developed as a result of self-fertilization. For example, among vines grown from the seed of Concord grape some will bear white fruit, while others may bear black fruit. The fruit may be larger or smaller, or earlier or later than that of the Concord. It is an interesting fact that although thousands of vines have been grown from Concord seed, there is no record yet of one which resembles the Concord closely enough to pass under the Concord name. No cultivated varieties of the apple are known which reproduce exactly true from seed. When a new variety of fruit appears which possesses sufficient merit to make it desirable to introduce it into cultivation it is commonly propagated asexually. Thus all of the Concord grape vines which are growing today have come directly or indirectly from the original Concord vine grown from seed by Ephriam Bull in Concord, Mass., more than sixty years ago. Likewise all of the Baldwin apple trees which are growing today have come directly or indirectly from buds or scions taken from the original seeding tree in Massachusetts which grew from seed more than 150 years ago. Plants which are grown by asexual methods of propagation commonly hold the distinguishing characteristics of the original plant, or at least to such an extent that they can all bear the same name without confusion. For example, when the word "Baldwin apple," is seen or spoken it brings to mind the idea of a particular kind of fruit having certain distinguishing characteristics which are recognized by fruit growers and fruit buyers throughout the country although the original Baldwin tree perished 100 years ago.

There are also cultivated varieties of plants propagated by seed

which come true to name from seed. As for example the Grand Rapids lettuce, the Dawson Golden Chaff wheat, the Stowell Evergreen sweet corn and other grains and vegetables which are propagated under varietal names. It is either not practicable or not possible to perpetuate such varieties from year to year by asexual methods of propagation. In such cases it is necessary to fix the type so that the plants will come true from seed before it can properly be named as a distinct variety.

ORIGINATION OF NEW VARIETIES.

We have seen how plants are propagated. Let us next inquire how new varieties are originated. We notice first that they may be originated by sexual reproduction, i. e., from seed. They may come from mongrel stock as chance seedlings which are selected and propagated either sexually or asexually by some one who discovers that they have sufficient merit to make them worthy of being introduced into cultivation, or they may come from seed which has been selected because of the excellence of the parent fruit or parent plant, as for example when plant seeds from the largest and finest colored fruit of some favorite variety of apple in the hope of getting an improved variety in some of the seedlings. Or they may be produced by crossing one variety upon another for the purpose of combining in the seedlings certain excellence of both parents.

In any of the cases above mentioned should a desirable seedling be produced it is an easy matter to perpetuate the variety if it belongs to any of those kinds of plants which are propagated asexually, as we have already seen. But if the new variety belongs to any of those kinds of plants which are commonly propagated from seed it becomes necessary as before stated, to fix the type before it is safe to disseminate it under the name of a new variety. This is done by growing generation after generation of the seeds and rejecting all plants which vary from the desired type. This is a process which is familiar to seedsmen; by them it is called "roguing" the plants. In some cases the type may be fixed within a very few generations, while with others a considerably longer period may be required.

SEED SPORTS.

Among fixed varieties there may appear suddenly a plant quite distinct from the type. Even when a variety has long been known in cultivation and its type has become permanently fixed, such plants may arise. Such plants may properly be called "seed sports" or "mutations" if they can be reproduced true to the new type under propagation. In this way certain dwarf lima beans have originated from pole lima beans and certain dwarf sweet peas from taller growing varieties. If one should desire to perpetuate a seed sport it generally would be necessary to go through the process of fixing the type as already described.

SELECTED STRAIN.

We have seen that the seed sport arises as a sudden variation or mutation from the fixed type. In other cases variations from the type may be developed gradually, as has been done in the cases of many selected strains advertised by seedsmen. I have in mind a certain neighborhood in which the gardeners are growing a peculiar type of lettuce for which they have no special name. They are engaged in forcing lettuce and grow their own seed. More than a quarter of a century ago they started with a standard variety. Gradually by rigid selection of parent stock and propagating through all these years only from plants showing some tendency to develop or mutate in a certain desirable direction they have produced a strain which is in some ways distinct from the original type and which suits their particular purpose much better. It is evident that this process is in effect one of accumulating or adding together slight mutations all of which tend to develop or progress in a certain direction. Plants of those types which have been developed in this way may properly be called pedigree plants. Numerous other instances of this kind of mutation might be cited had we time to consider them.

We have seen that under the sexual methods of reproduction new varieties may be obtained either by selecting chance seedlings of a known single parent or by cross breeding from distinct parents. We have seen also that among fixed types new varieties may be developed from suddenly appearing distinct variations called seed sports or mutations or they may be produced by gradual processes as in selected strains.

Let us next inquire whether new varieties may originate by asexual propagation.

Graft Hybrids.—Are new varieties ever produced asexually which correspond to the hybrids produced under the sexual method by cross-fertilization? Claims have sometimes been made that it is possible to produce new varieties by grafting which are entitled to be called "graft hybrids." The work which Daniel has done in France demonstrates that this has been done. Other authentic cases are also on record. As a matter of fact, however, it is universally conceded that graft hybrids are exceedingly rare.

Bud Sports.—Bud sports are well known. They correspond to seed sports in that they appear suddenly. They usually show permanently in their new characters when propagated, entitling the sport to be called a new variety or mutation, yet some bud sports prove quite unstable when propagated.

Numerous instances in which new varieties have originated as bud sports are found among ornamental plants and they are not unknown among orchard fruits. More than one case is known where bud sports have appeared on the Concord Grape. I am perfectly familiar with one instance of this kind. From a bud near the base of the main stalk of

a certain Concord vine there has arisen a cane which for many years has borne clusters with fewer but much larger berries than those that are produced on the typical Concord cluster borne on other portions of the same vine. Seedlings which have been produced from self-fertilized seed of this Concord sport differ in a marked degree from those produced from the self-fertilized seed from typical Concord fruit borne on other portions of the same vine. Among other instances of cultivated fruits which have originated from bud sports are the Collamer Twenty Ounce and the Banks Gravenstein apples. It seems altogether probable that the Gano and the Black Ben Davis apples are bud sports of the old Ben Davis—since they differ from that variety chiefly in the single character of color of fruit.

Bud Selected Strains.—There can be no doubt that it is possible in some cases to develop under asexual propagation selected strains by a gradual process of selection of the propagating word or other asexual portion of the plant as tubers, roots, etc. This process corresponds to the development of selected strains grown from seed. In this way varieties of the pear which in the original seedling tree were armed with sharp thorny spurs have been changed so that it may be truly said that the thorns have been bred away. In a like manner thorns have been bred away from certain cultivated varieties of the orange. Galloway, who has given much attention to the growing of violets, states (Galloway, B. T. Violet Culture 109-116) that the violet is a plastic organism. "Different plants from the same source behave differently. To be successful a man must work persistently to develop plants to fit the conditions which he can provide. Left to itself the tendency of the violet is to retrograde. By proper selection and right cultural methods the yield may be raised from fifty flowers to 100 flowers per season in three years."

The potato appears to be a very variable plant and there is experimental evidence to show that in some instances the yield has been increased decidedly by selecting seed tubers from very productive hills.

From all that has been said it appears that new varieties may be produced sexually in seed hybrids, asexually in graft hybrids; sexually in seed sports, asexually in bud sports; sexually in selected seed strains and asexually in selected bud strains. Perhaps after all, we must admit that our friends who apply the term pedigree stock to plants propagated asexually have some show of reason for such a use of the term.

But let us look into the question of the variation of plants a little further. It must be admitted that among plants that are asexually propagated the term pedigree stock can not rightly be used as indicating that the distinctive features of the plant from which the pedigree buds or scions or propagating wood is taken are capable of being transmitted in the bud so that they can be depended upon to appear in the so-called pedigree plants. In other words, that it is in fact a permanent sport or mutation.

This leads us to observe that among our fruit bearing plants, so far as is known, this is a comparatively rare occurrence. There are many, many cases in which it is supposed to occur where really it has not yet been demonstrated. We should not lose sight of the fact that many of the differences which different orchard trees show in habits of growth and productiveness; in the size, color and quality of fruit produced; in resistance to disease and in other ways, may be satisfactorily accounted for on the ground of differences of environment. Take for example the case of certain apples which are known to attain their highest degree of perfection in certain regions, whereas in other regions they do very poorly, and this occurs regardless of where the plants of the particular variety in question were obtained. The Fameuse attains remarkably high color and quality along the shores of Lake Champlain and in the St. Lawrence valley, whereas when grown in many sections of western New York it lacks in both color and quality. This holds true in so many individual trees and in so many different orchards in the regions named that it is impossible to account for it on the assumption that it is due to differences in the buds from which the stock was propagated. Many other instances of this kind might be cited.

Those who have had opportunity to compare the Baldwin apples which are grown on the Pacific coast with those which are grown in New England and New York have observed that they are distinctly different from the eastern grown fruit, being decidedly elongated. The Baldwin trees which have been shipped from eastern nurseries to Washington and Oregon are grown from buds and scions taken from widely separated sources. The uniformly peculiar form of this fruit which is grown in the Pacific Northwest can not be accounted for on the supposition that the buds from which the trees were propagated all came from some bud sport of the Baldwin. It must be attributed to a characteristically local difference in environment. There are many other differences which are observable among orchard varieties in habit of tree and color of fruit which are known to be due only to differences in environment. Such differences in tree or fruit can not be expected to be transmitted under propagation.

What reply shall we make, then, to the question as to whether or not it is good policy to follow the pedigree idea in securing stock for planting in the orchard? If one happens to know of an individual tree or of a particular orchard showing superior characteristics of tree or fruit is it desirable to propagate from such a tree or from such an orchard rather than from one which does not show superiority? Certainly, it is desirable. Although we may not be sure that anything can be gained by so doing, yet we feel that we are on the safe side, at least, and that possibly we are making progress in the right direction.

The question is often asked whether it is desirable to pay higher prices for the so-called pedigree stock than for the ordinary stock of the same variety. If one can be sure of the pedigree and know that the desirable features which it stands for have been transmitted by propa-

gating for more than one generation from this stock, then I believe it would be good economy to take such stock at prices in advance of those which are charged for the ordinary stock.

In conclusion I would sum up the whole question by saying that plant pedigrees of the right kind are worth paying for, but before paying for them it is well to be sure that the pedigree represents more than a single generation.

DISCUSSION

Mr. Yeager: The professor has got us fellows of the laity in pretty deep water. We unscientific fellows, this is very mysterious to us. There are some things about it we do not understand. I understand from what the professor says, that there are some things that are superior to others in the nursery business, for instance, these trees. We all know that there is now and then a tree that shows superior merit in the production of fruit. But I am not quite clear yet about his argument as to whether you can take the scions from this limb,—we will say it is a limb, and not the whole tree as he illustrated in the matter of the grape vine. I am certain you did not find out whether the grapes growing on that sport of the Concord were as good as the ones from which you took the seeds. Do I understand you to say, professor, that if you take the scions from this sport or apple tree, and propagate it from that, as the nurserymen do, that each one of these scions taken from that will reproduce the identical kind of apple that grew on that identical sport or limb. Isn't there always a tendency to revert back to the fruit that grew on the other part of this tree, not known as the sport. And is it fixed and certain that the wood taken from that identical limb will reproduce the apples or fruit grown on that identical limb. About the apple, will you state whether you think it will revert, and will you also state whether you think scions taken from a healthy tree, a bearing healthy tree, producing fine fruit for a term of years and propagated in the nursery row over here, and those taken from the yearling out of the nursery row, do you know anything about what those will produce, and you know they are healthy, which in the end, if taken for a long period of years will produce the same strain of apples.

Professor Beach: There is a great deal of conclusion about that. We need more facts before we can form safe conclusions in regard to these matters, and I am frank to say that the best evidence does not reveal much, and those who have studied the things know comparatively little about the subject. But we do have some facts. In the case of the red twenty-ounce to which I referred, that held true under propagation. The scions taken from the sport which were scions of the west side of the tree, when those came into bearing they bore the same kind of fruit as the original sport. Now you may have a large Wealthy apple tree, which is due to the location in which it is grown. The Winesaps that are produced in southern Kansas are not the same type that are grown at Woodbine, Iowa. There are differences in environment, and that fact

must be taken into consideration when you are studying the question of variation. We see differences and variations on the same tree. One branch may get better food supply from the soil, better air and better sunlight. There are all sorts of environmental conditions to take into consideration, so if we see a tree that is producing superior Wealthy apples we can not say because it does that or this it is superior to a bud sport, it may be due to environment. If it does that in generations then we have a pedigree. We have an illustration of that in Mills county Iowa, where a man claims he has a Wealthy that ripens about a month later than the ordinary Wealthy, and as desirable in size and other qualities. It will be worth propagating, won't it?

So the point I want to leave with you is this: My purpose will be satisfied if I can get you to thinking about these things carefully. I want to say again that the man who makes a selection of scions from trees or plants that have any superior color or size, or anything else, he is on the safe side. Although it may be a bud variation, I would not say, possibly it is, it may be due to variation in environment.

Mr. Christy: The Baldwin apple you spoke of, taken to the west, and growing there; if you take it there and grow it for a few years and then take it back east, do you think you would get the same kind of apples as originally?

A. No, sir. I had some scions I got from Washington ten years ago; they were taken back to New York state, and although I have not seen the fruit myself, Prof. Hedrich says they are just like the ordinary Baldwin in New York. If farmers can be sure what that pedigree represents, and that it represents a line of decent in which the individuals have a superior performance record, I would say by all means for the farmers to buy them. Isn't it better to pay a dollar for a good tree than to plant an inferior tree that will be no good to you?

Mr. Pollard: We have got onto a question that is very important to a man who is planting trees in a commercial way. Now I would like to inquire, does your experience demonstrate that grafts or scions taken from a bearing tree that is known to be productive and producing good fruit, is there an inclination of the scion to produce more prolifically than are those scions that are taken from water sprouts or from yearling trees as Mr. Yeager suggests.

Prof. Beach: I must confess that I know of very little reliable evidence on that point.

Q. Now I just want to recite a condition that exists in our orchard. We have at home a ten acre plat of Jonathans. We also have a great many Jonathan trees outside of that plat. But in this particular plat I do not believe that there is over 30 per cent of the trees that have produced enough fruit to begin to pay for the labor that has been spent in cultivating them, planting them, and taking care of them, and so forth. Now the reason for that may be that these scions were taken from water sprouts instead of from a bearing tree. I do not know whether or not we are correct in that, but we do know that we

have trees that are not producing well. It is from some cause and I do not know what it is, but there is some reason.

Mr. Yeager: The professor is right, it is from environment.

Mr. Pollard: Well, I hardly agree with you. There is 100 acres; the topography is rolling and practically the same as in the other, and though I may be wrong, yet if I was planting trees I would rather get my scions from an orchardist that got his scions from bearing trees, than from a nurseryman that got his scions from water sprouts, and so forth. I would infer from what you said that you think that the nurserymen who are selling us these trees are practicing a game on us?

Prof. Beach: If that is so I want to offer my sincere apologies to the great rank and file of the nurserymen. I do not want to give that impression.

Mr. Pollard: Now you spoke about this pedigreed stock at one time and quoted the Jersey cow. How do you know about the pedigree of that cow? Where do you go to get that pedigree started? How far back should the fruit man go? This industry is a new industry and should we trace back to Mount Sinai? Some trees will bear apples and bear big ones. In our orchard we had a row of Sweets; there were two trees in that row that bore special apples, and I took 15 apples off the trees and brought them up to the state fair one year and they weighed fifteen pounds. Now those trees every year bear the same kind of apples, and other trees standing the same kind of care every year and in the same kind of ground bear no apples, and they are the same kind of trees. Haven't we got a good start for a pedigree, in a case like this? If not, where are we going to start our pedigree?

Prof. Beach: First of all, I want to say with regard to the nurserymen. As far as I see in the nursery catalogues there is less than five per cent of the nurserymen that are offering pedigreed trees. Now among those who do offer trees I am going to give the man the credit of being honest in his advertisement with regard to it, until I am compelled by proof to take the contrary position with regard to it; but when the man advertises to furnish pedigreed trees by the million when he must go out and take them from the bearing tree, I begin to doubt what he means by his pedigree.

Then the other point, as to how far back must the pedigree go, I would want the pedigree to go back far enough. I would want at least one generation to come into bearing so that I could demonstrate positively that the points of color or productiveness were inherent in the scion, or whether it had been brought about by superior conditions of environment.

Mr. Pollard: Now one has a good many secrets they do not like to reveal, but we have an apple tree, a Grimes Golden Pippen, that is crazy, I call it,—the tree has gone crazy. I noticed two or three years ago as I was going by that tree and there was one tree that had raised apples on it, and the apples were covered with rust on one limb, and all the rest of the tree had the real Grimes Golden color, a light colored apple,

and fine in appearance, and there was just one limb on that tree that had this rust. I examined to see if there was anything wrong, and there was no sign of anything, everything was all right. Now what was the matter with that?

Prof. Beach: I formerly knew an orchard of fifty acres about two-thirds Baldwin and one-third Greening. It had enough pollen, and I was asked for my opinion on it. At that time I was studying the self-fertility of fruits and I came to the conclusion that it was because they needed other varieties in there to make them produce, and one of the old veteran fruit growers in that community told me it was planted in the wrong locality, and the soil was wrong. About two years later they changed hands, and a man who had been handling orange groves took charge of the orchard. (The reporter did not catch what the orange man did, but he brought the orchard into productiveness in some way.)

The Chairman: We will now listen to an illustrated lecture by E. H. Favor, associate editor of "The Fruit Grower and Farmer" on "Pruning for Fruit Production."

(The talk being illustrated by lantern slides, and the necessary darkness made it impossible to take the proceedings in shorthand.)

DISCUSSION.

Mr. G. A. Marshall: We have had a number of distinguished visitors here from neighboring states, and there are a couple that I do not believe have been mentioned. E. S. Welch of Shenandoah, and Mr. Lopieck of Woodbine are here with us, and I move they be made honorary annual members of this society. Motion seconded and carried.

Professor Beach: I still have in mind part of the question Mr. Polard asked in regard to that unproductive orchard, and I will say that is a deep and difficult subject. We do not always have the evidence in hand to decide just what the causes are that produce the results that we see in trees. With reference to this matter of unproductiveness of trees, grown from water sprouts or from scions taken from nursery stock there is this evidence that I have, namely, that it does make a difference sometimes in the early part of the life of the plant as to how quickly it comes into bearing. Whether the propagating wood is taken from mature bearing wood, or whether it is taken from water sprouts, and my own opinion is that is the difference, which is overcome within a comparatively few years. I had in mind one man who as a matter of curiosity used to propagate apples by taking fruit sports. Here is something that has bearing upon this point; it is known that with some varieties of grapes, if you take the cuttings from the spring growing ones, that come from about the root, that if you take the cuttings from these they do not give as productive vines, at least early in the period of their history as do vines that are propagated from canes of more mature growth. We must recognize this principle in pruning and propagating, and difficult questions pertaining to the handling of plants, that we

have two different conditions of growth. We have with the little sapling first, the vegetating period in which it is the competitor of all others, and then we have a later, more mature condition of the tree, or the plant, or the animal, and in each we get the development of the reproductive organs, and the propagation of the seeds. Now if we recognize those things, it is reasonable then within certain limits to expect that if we propagate, from the tree, growing wood, we will get a more effective condition, other things being equal with the plants, for a short period of time in its history, than we will, if we propagate from the more mature wood. So there is one point to be taken into consideration, as bearing upon this question. If I had an orchard such as Mr. Pollard has, before deciding upon scions taken from bearing trees, I would study all of the other factors of environment, bearing upon this question. It may be that by giving the roots a dressing of manure, or by so cultivating them that they have plenty of moisture, all during the growing season, or by some way of a change of environment, in some way it may be possible to change those trees and bring them into a more productive habit than they are at present. If that does not bring results, then it would be an open question as to what would bring them into a more productive state.

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. Pollard: At this time I wish to read the report of the committee on resolutions. The report is as follows:

RESOLUTIONS.

1. That we favor the continued support and further extension of the horticultural institutes as conducted by this society during the past year. In this connection we recommend that the subject of cooperation and organization among fruit growers be considered in addition to other topics at these institutes.

2. That we recommend the appointment of a committee of one person from each of the nineteen fruit districts of the state. A majority of which shall constitute a working committee for the revision of the recommended fruit lists of this society.

3. That we favor the appointment of a standing committee on forestry and parks, to consist of six members; four from this society and the forester of the state university, who shall act as its chairman. It shall be the duty of this committee to consider and promote the welfare of the park and forestry interests of this state.

4. That we recommend to the director of the farmers' institute the selection of a competent horticulturist to be added to their list of workers in all institute work,—and that special attention be paid to the call for aid and instruction in horticulture from the western sections of this state.

5. That we favor the continuation of the present method of conducting a fruit exhibit in the auditorium, in connection with our annual meeting.

6. That inasmuch as this society has received an invitation from Omaha, to place on exhibition a showing of Nebraska fruits, that we ask our board of directors to consider the feasibility of making such a display, and to take action accordingly.

7. That we favor the retention of the present location of our state university, and we also favor a liberal appropriation by the present legislature for necessary extension of the campus and the erection of permanent buildings.

8. That the thanks of this society are due and are hereby extended to the Commercial Club of Lincoln for their provision for the use of the auditorium in making the present display of fruits and flowers. We ask the secretary of the society to send to the secretary of said club, a copy of above resolution. (Signed)

E. M. POLLARD,
L. O. WILLIAMS,
L. M. RUSSELL.

Mr. Pollard: I move the adoption of this report.
Seconded. Carried.

The Chairman: Do I understand that it is the intention of the committee that the president appoint this committee on revision?

Mr. Pollard: Yes, sir.

RESOLUTION BY P. J. BENTZ.

Mr. Bentz: I have another resolution I would like to see adopted by this society, and it reads as follows:

Whereas, trees modify the severity of climate, and add comfort and beauty to the home, and in other ways exert a beneficent influence on the life of both man and beast, be it therefore

Resolved, That it is the sense of the Nebraska State Horticultural Society that the homestead law should be amended so as to require the planting of at least one per cent of the area of a homestead to trees before final patent is issued, and that said trees be furnished by the government, and the planting done under the direction of the bureau of forestry.

Resolved, That our secretary be directed to forward a copy of this resolution to our senators and congressmen, with the request that they introduce a bill amending the national homestead law to conform with this resolution.

Mr. VanHouten: The resolution is all right, only I think the amount is not great enough, and there should be a limitation; it should be confined to those places where timber is a necessity, and not to those home-

steads where they have to go to the necessity of getting rid of this timber.

Mr. Bentz: I accept that suggestion and amend the resolution in that way.

A Member: I would like to suggest that the amount is too small and I will move you we adopt the increased amount of one-tenth or one-sixteenth in the resolution.

Mr. Bentz: I had the honor of introducing that resolution before the forestry congress, with this difference, and it was adopted by that body with that difference, that the amount of planting required was five per cent instead of one, and the great objection that was urged was that it was impossible and a hardship on the homesteader. Now the purpose of this resolution is to forge an entering wedge into this proposition and if we should accept the gentleman's suggestion that would kill the very resolution that is introduced and would destroy the purpose, and I hope that this society will leave it in its original form, of one per cent which imposes no hardship on anybody and makes it possible for trees to be planted in a systematic way by every homesteader without regards to where he is located, because it is a well known fact that trees will grow everywhere. Some varieties of trees will grow anywhere where cereal crops will grow, provided they receive the care and culture that our cornfields receive.

Mr. Pollard: I second the motion but not the last amendment. Carried.

Mr. Pollard: I move we adjourn. Seconded. Carried.

The forty-fourth annual meeting of the Nebraska State Horticultural Society then adjourned.

SECRETARY'S ANNOUNCEMENT.

October 1, 1913.

To the Readers of the 1913 Report:

On August 1, 1913, our most efficient secretary, Mr. C. G. Marshall, resigned the position of secretary, to take the managership of the Eastern Nebraska Fruit Growers' Association, with headquarters at Nebraska City. This association is composed of practically all the growers in eastern Nebraska who spray and take good care of their orchards. Mr. Marshall has done efficient work in building up our Society and putting it on the map as a progressive society of a progressive fruit state since he has had charge of the secretary's office. The Society sustained a distinct loss when Mr. Marshall quit serving us in an official capacity, but as long as he is identified with the horticultural interests of the state he will be a booster for the Society. He is an aggressive and enterprising young man and will make a success of whatever he undertakes. The Eastern Nebraska Fruit Growers' Association is indeed fortunate in procuring the services of Mr. Marshall, as he will build up a reputation for them that will be worth more than can be counted in dollars and cents.

During the month of August our esteemed president acted as secretary, and it was due to his untiring efforts that, in this year of extreme drouth and heat, the fruit show at the 1913 state fair equaled any show of recent years when the state was blessed with more abundant moisture.

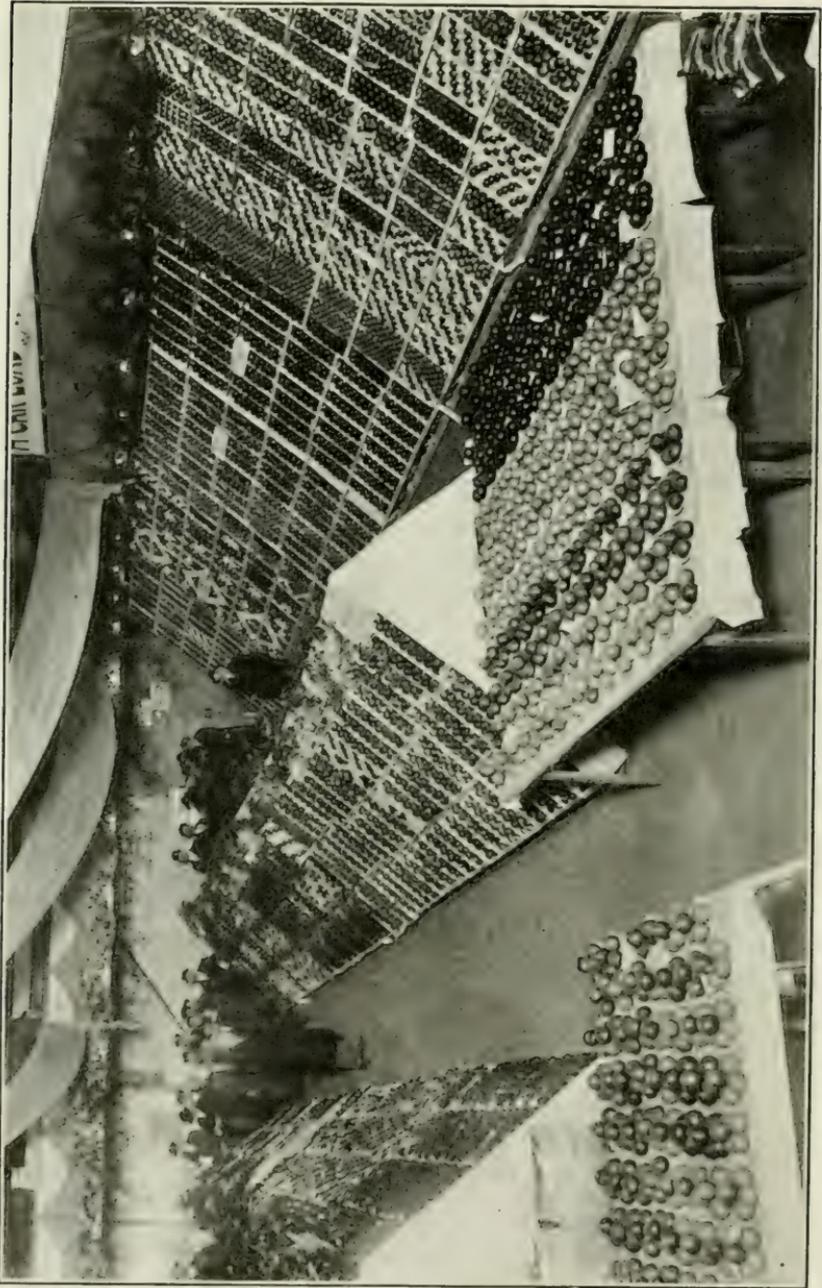
On August 30, the board met and accepted Mr. Marshall's resignation and elected your humble servant as Mr. Marshall's successor, to take effect on September 1, 1913. Although I have had several years' experience growing fruit in Nebraska, yet I took charge of the office with a feeling that there is a great responsibility and work devolving on me to keep the work up to the standard set by Mr. Marshall and to push the work forward. I need the help of every member of the Society to do this and help put Nebraska in the front rank as a fruit-producing state where she rightfully belongs.

All the material in this report up to this article was in the printer's hands when I took charge of the office. The first thing he told me was that we needed more material to make up the necessary number of pages. I immediately got busy and have tried to gather articles that seem to be of great importance to the horticultural interests of the state at present, and be of record to the readers of future years. If the report is not up to former years, remember this is my first attempt and I hope that you will bear with me this time.

Yours for a better Horticulture Society.

J. R. DUNCAN,

Secretary.



NEBRASKA GROWN BOXED APPLES AT THE WINTER SHOW JANUARY 20, 1913

ANNUAL SHOWS AND AWARDS

ANNUAL FRUIT SHOW.

C. G. Marshall.

The annual fruit show, held in Lincoln in connection with the meeting of the State Horticultural Society during the week of January 20, was the largest apple show ever staged in Nebraska, and one of the largest held this season between the Rocky mountains and the Atlantic ocean. Almost 1,000 bushel boxes were on exhibit, as well as hundreds of plates of five apples each. A solid bank of boxed apples extending from the balcony to the floor and the entire length of the city auditorium was placed on the north side. This section contained approximately a carload. Next to it were two pyramids quite as long and supporting almost another carload.

The display was an eye-opener to Nebraska people who visited the show, as well as to visitors and judges from other states. These apples were carefully packed, every apple having its place in the box just as the fruit of the Northwest is put up. It was demonstrated to the satisfaction of all visitors that Nebraska apples when properly grown and carefully graded and packed are just as attractive as apples grown in any section. Many visitors remarked that they had visited the great apple shows of the West and Northwest but never had they seen a display of better or more attractive apples. Expressions such as "I did not know that such apples grew in Nebraska" were heard on every side.

A great array of color was presented. The Grimes' Golden and Northwestern Greening, a rich golden slightly tinted with pink, and the Arkansas Black and Black Twigs, almost black in color, make striking contrasts, while the intermediate shades and colors were represented in the Winesap, Jonathan, Gano, Ben Davis, York Imperial and numerous other varieties. Then the long tables crowded with bright colored carnations, roses and violets across the east end and the white and yellow corn on the south side of the auditorium made a combination of beauty surpassing anything ever seen at an exhibition of this kind in Nebraska.

The cooking demonstrations given in an adjoining room by the domestic science department of the University of Nebraska attracted large crowds of ladies at every session. Fruits were prepared in view of the ladies present, the demonstrator explaining each step in the preparation of each dish; small bits were then served to the ladies present. Recipe books containing numerous recipes for preparing and serving apples and corn were handed out with the compliments of the State Horticultural Society and the Corn Improvers' Association.

Box packing demonstrations were given daily by Professor Laurenz

Green of Ames, Iowa. Those interested were taught how to wrap apples rapidly and neatly and how to place them in the boxes to fill them so the lids when placed on would not bruise a single apple, and yet would bind each apple so none would be loose. Much interest was shown in this work by Nebraska's up-to-date apple growers, who are anxious to improve the quality of pack. It is now being realized that packing is one of the most important phases of fruit production and marketing.

On the stage of the auditorium was arranged a miniature model home, with the proper settings, in contrast with another where no pains had been taken to make it home-like and attractive. The better home was neatly painted with colors harmonizing with the landscape work. A background of evergreens was arranged to give the house the best setting, and at each side trees and shrubs were planted to give the best effects. This was the work of W. H. Dunman, landscape gardener for the university.

AWARDS WINTER FRUIT SHOW, 1913.

- 50 Boxes Commercial.** 1st \$60, 2d \$40, 3d \$20, 4th \$10—
 1st—Ray W. Hesseltine, Peru.
 2d—Keyser & Marshall, Lincoln.
 3d—Youngers & Burns, Geneva.
 4th—Marshall Bros., Arlington.
- 30 Boxes Commercial.** 1st \$40, 2d \$25, 3d \$10, 4th \$5—
 1st—Duncan-Hesseltine Fruit & Nursery Co., Peru.
 2d—Marshall Bros., Arlington.
 3d—Youngers & Burns, Geneva.
 4th—Keyser & Marshall, Lincoln.
- 20 Boxes Commercial.** 1st \$25, 2d \$15, 3d \$10, 4th \$5—
 1st—Ray W. Hesseltine, Peru.
 2d—Marshall Bros., Arlington.
 3d—Keyser & Marshall, Lincoln.
- 10 Boxes Jonathans.** 1st \$12, 2d \$8, 3d \$5—
 1st—Duncan-Hesseltine Fruit & Nursery Co., Peru.
 2d—G. S. Christy, Johnson.
 3d—Keyser & Marshall, Lincoln.
- 10 Boxes Grimes Golden.** 1st \$12, 2d \$8, 3d \$5—
 1st—Ray W. Hesseltine, Peru.
 2d—Keyser & Marshall, Lincoln.
- 10 Boxes Winesap.** 1st \$12, 2d \$8, 3d \$5—
 1st—Keyser & Marshall, Lincoln.
 2d—Russell Bros., Lincoln.
 3d—G. S. Christy, Johnson.
- 10 Boxes Ben Davis.** 1st \$12, 2d \$8, 3d \$5—
 1st—Ray W. Hesseltine, Peru.
 2d—Duncan-Hesseltine Fruit & Nursery Co., Peru.
 3d—Keyser & Marshall, Lincoln.

- 10 Boxes Gano. 1st \$12, 2d \$8, 3d \$5—
 1st—Ray W. Hesseltine, Peru.
 2d—Duncan-Hesseltine Fruit & Nursery Co., Peru.
 3d—Marshall Bros., Arlington.
- 5 Boxes Mammoth Black Twig. 1st \$8, 2d \$5, 3d \$2—
 1st—Duncan-Hesseltine Fruit & Nursery Co., Peru.
 2d—G. S. Christy, Johnson.
- 5 Boxes Missouri Pippin. 1st \$8, 2d \$5, 3d \$2—
 1st—Russell Bros., Lincoln.
 2d—Duncan-Hesseltine Fruit & Nursery Co., Peru.
 3d—G. S. Christy, Johnson.
- 5 Boxes N. W. Greening. 1st \$8, 2d \$5, 3d \$2—
 1st—Marshall Bros., Arlington.
 2d—G. S. Christy, Johnson.
- 5 Boxes Salome. 1st \$8, 2d \$5, 3d \$2—
 1st—Marshall Bros., Arlington.
- 5 Boxes Arkansas Black. 1st \$8, 2d \$5, 3d \$2—
 1st—R. B. Duncan, Peru.
 2d—Keyser & Marshall, Lincoln.
- 5 Boxes York Imperial. 1st \$8—
 1st—Keyser & Marshall, Lincoln.
- 5 Boxes Mann. 1st \$8—
 1st—Marshall Bros., Arlington.
- 5 Boxes Perry Russet. 1st \$8—
 1st—Marshall Bros., Arlington.
- 5 Boxes Roman Stem. 1st \$8—
 1st—Marshall Bros., Arlington.
- 5 Boxes Sheriff. 1st \$8—
 1st—Marshall Bros., Arlington.
- 5 Boxes Gano. 1st \$8, 2d \$5—
 1st—G. S. Christy, Johnson.
 2d—Duncan-Hesseltine Fruit & Nursery Co., Peru.
- 5 Boxes Winesap. 1st \$8, 2d \$5—
 1st G. S. Christy, Johnson.
 2d—Keyser & Marshall, Lincoln.
- 5 Boxes Jonathan. 1st \$8, 2d \$5—
 1st—G. S. Christy, Johnson.
 2d—Keyser & Marshall, Lincoln.
- 5 Boxes Lawver. 1st \$8—
 1st—Keyser & Marshall, Lincoln.
- 5 Boxes McAfee. 1st \$8—
 1st—Keyser & Marshall, Lincoln.
- 5 Boxes Paragon. 1st \$8—
 1st—Ray W. Hesseltine, Peru.
- 5 Boxes Genet. 1st \$8—
 1st—Youngers & Burns, Geneva.
- 5 Boxes Stark. 1st \$8—
 1st—Youngers & Burns, Geneva.

5 Boxes Ben Davis. 1st \$8, 2d \$5, 3d \$2—

1st—Ray W. Hesseltine, Peru.

2d—G. S. Christy, Johnson.

3d—Marshall Bros., Arlington.

Best and Largest Display Boxed Apples. 1st one 50-gallon barrel Lime-Sulphur, Rex Co., Omaha—

1st—Marshall Bros., Arlington.

Best 5 Barrels, any Variety. 1st \$10, 2d \$10, 3d \$5—

1st—Russell Bros., Lincoln.

2d—G. S. Christy, Johnson.

3d—C. D. Hahn, Johnson

50 Plates, Display and Condition to Govern. 1st \$10, 2d \$7, 3d \$5, 4th \$3—

1st—Keyser & Marshall, Lincoln.

2d—Ray W. Hesseltine, Peru.

3d—Marshall Bros., Arlington.

4th—Velvick & Whittaker, Brownville.

50 Plates (Scale of Points. Comparative Rating of Varieties to Govern).**1st \$10, 2d \$7, 3d \$5, 4th \$3—**

1st—G. S. Christy, Johnson.

2d—C. H. Barnard, Table Rock.

3d—Ray W. Hesseltine, Peru.

4th—Marshall Bros., Arlington.

Single Plates. 1st \$2, 2d \$1—

Arkansas—

1st—G. S. Christy, Johnson.

2d—Duncan-Hesseltine Fruit & Nursery Co., Peru.

Baldwin—

1st—Marshall Bros., Arlington.

Ben Davis—

1st—Duncan-Hesseltine Fruit & Nursery Co., Peru.

2d—Russell Bros., Lincoln.

Gano—

1st—Ray W. Hesseltine, Peru.

2d—Duncan-Hesseltine Fruit & Nursery Co., Peru.

Genet—

1st—Velvick & Whittaker, Brownville.

2d—Youngers & Burns, Geneva.

Jonathan—

1st—Ray W. Hesseltine, Peru.

2d—C. H. Barnard, Table Rock.

Lawver—

1st—Keyser & Marshall, Lincoln.

Mann—

1st—Marshall Bros., Arlington.

2d—Keyser & Marshall, Lincoln.

Minkler—

1st—Velvick & Whittaker.

2d—Keyser & Marshall, Lincoln.

Missouri Pippin—

1st—Velvick & Whittaker.

2d—Keyser & Marshall.

N. W. Greening—

1st—Marshall Bros.

2d—Ray W. Hesseltine.

Paragon—

1st—Ray W. Hesseltine.

2d—Duncan-Hesseltine Fruit & Nursery Co.

Rome Beauty—

1st—Keyser & Marshall.

2d—G. S. Christy.

Salome—

1st—Marshall Bros.

Stark—

1st—Marshall Bros.

2d—Youngers & Burns.

Virginia Beauty—

1st—Marshall Bros.

2d—Velvick & Whittaker.

Willow Twig.

1st—Marshall Bros.

Winesap—

1st—G. S. Christy.

2d—C. D. Hahn.

Windsor—

1st—Marshall Bros.

York Imperial—

1st—Keyser & Marshall.

Ramsdell's Sweet—

1st—Marshall Bros.

Wyeth—

1st—Marshall Bros., Arlington.

Maiden Blush—

1st—Marshall Bros., Arlington.

2d—Velvick & Whittaker, Brownville.

N. Y. Pearmain—

1st—Marshall Bros., Arlington.

Talman Sweet—

1st—Marshall Bros., Arlington.

L. R. Romanite—

2d—Marshall Bros., Arlington.

Wealthy—

1st—Velvick & Whittaker, Brownville.

2d—Marshall Bros., Arlington.

Fameuse—

1st—Marshall Bros., Arlington.

Iowa Blush—

1st—Marshall Bros., Arlington.

Sheric—

1st—Marshall Bros., Arlington.

2d—Edw. Nunamaker, Arlington.

Milam—

2d—Marshall Bros., Arlington.

Pewaukee—

2d—Marshall Bros., Arlington.

Northern Spy—

1st—Marshall Bros., Arlington.

Roman Stem—

1st—Marshall Bros., Arlington.

Fall Winesap—

1st—Marshall Bros., Arlington.

Pewaukee—

1st—Velvick & Whittaker, Brownville.

Walbridge—

1st—Velvick & Whittaker, Brownville.

Roman Stem—

2d—Velvick & Whittaker, Brownville.

Lansingburg—

1st—Velvick & Whittaker, Brownville.

Winter Swaar—

1st—Velvick & Whittaker, Brownville.

Fall Winesap—

2d—Velvick & Whittaker, Brownville.

Black Ben Davis—

1st—J. M. Packwood, Lincoln.

Ark Black—

1st—Keyser & Marshall, Lincoln.

2d—R. B. Duncan, Peru.

W. W. Pearmain—

1st—Keyser & Marshall, Lincoln.

McAfee—

1st—Keyser & Marshall, Lincoln.

Grimes Golden—

1st—Ray W. Hesseltine, Peru.

2d—Keyser & Marshall, Lincoln.

Northern Spy—

2d—Ernest Hornung, Raymond.

Red Warrior—

1st—Youngers & Burns, Geneva.

FLORAL AWARDS WINTER FRUIT SHOW, 1913.

Vase 25 American Beauties. 1st \$8, 2d \$5, 3d \$3—

1st—L. Henderson, Omaha.

2d—Frey & Frey, Lincoln.

3d—C. H. Green, Fremont.

Vase 50 Tea Roses (5 varieties or more). 1st \$10, 2d \$8, 3d \$5, 4th \$3—

1st—L. Henderson, Omaha.

2d—C. H. Green, Fremont.

3d—Frey & Frey, Lincoln.

4th—Simanton & Pence, Falls City, Neb.

Vase 50 Carnations (6 varieties or more). 1st \$8, 2d \$5, 3d \$3, 4th \$2—

1st—C. H. Green, Fremont.

2d—Simanton & Pence, Falls City.

3d—J. W. Lawson, York.

4th—Dole Floral Co., Beatrice.

Vase 25 Red Carnations. 1st \$4, 2d \$3, 3d \$2, 4th \$1—

1st—Simanton & Pence, Falls City.

2d—L. Henderson, Omaha.

3d—C. H. Green, Fremont.

4th—Dole Floral Co., Beatrice.

Vase 25 White Carnations. 1st \$4, 2d \$3, 3d \$2, 4th \$1—

1st—J. W. Lawson, York.

2d—Dole Floral Co., Beatrice.

3d—Simanton & Pence, Falls City.

4th—C. H. Green, Fremont.

Vase 25 Dark Pink Carnations. 1st \$4, 2d \$3, 3d \$2, 4th \$1—

1st—Dole Floral Co., Beatrice.

2d—C. H. Green Fremont.

3d—Simanton & Pence, Falls City.

4th—Frey & Frey, Lincoln.

Vase 25 Light Pink Carnations. 1st \$4, 2d \$3, 3d \$2, 4th \$1—

1st—J. W. Lawson, York.

2d—Dole Floral Co., Beatrice.

3d—Frey & Frey, Lincoln.

4th—Simanton & Pence, Falls City.

Vase 100 Violets. 1st \$4, 2d \$3, 3d \$2, 4th \$1—

1st—Dole Floral Co., Beatrice.

2d—Frey & Frey, Lincoln.

3d—L. Henderson, Omaha.

4th—C. H. Green, Fremont.

General Display Cut Flowers, (Diploma)—

1st—L. Henderson, Omaha.

FRUIT AND FLOWER SHOW AT THE STATE FAIR, 1913.

The state fair of 1913 will long be remembered as occurring under most unpleasant weather conditions. The major portion of the state had been "cooked to a turn" for two months prior to the fair, with no rain to afford relief, either just before or during the fair.

Hot and dry and dusty would accurately describe conditions.

Yet despite these drawbacks the Horticultural Society may well be proud of the exhibit on display for fair visitors. It was owing to the untiring energy of Mr. C. H. Barnard, president of the society, and acting secretary during August, that all the old exhibitors and a number of new ones were on hand at the opening of the show with exhibits large enough to fill horticultural hall.

The fruit, while not averaging quite as large as in former years, yet made a very creditable show. Of course the bulk of fruit shown was apples, of which there were over 125 different varieties on display, ranging from the earliest to the latest. Most of the apples lacked the high color of former years, which may be accounted for by the drouth, and that apples are two weeks later than common this year.

The pear display was much larger this year than ordinarily and averaged up well in size. In addition to premiums on pears offered in former years, special premiums were offered on 50-plate display of pears.

This was calculated to bring on a large pear display. This year being so dry only three entries were made.

The peach show was about on a par with former years, possibly a little better than ordinary, but showed the effects of a dry summer.

The plum display was fully up to normal in size and number of entries. Several new seedlings were on display that would be fine enough for any one's taste.

Grapes are one of the foremost small fruits that are grown in a commercial way in eastern Nebraska at present, and were on display in numerous kinds and colors, black grapes, however, predominating. Judging from the small amount of rainfall that fell where part of the grapes grew, and their high quality and fine looks, it would indicate that our best dry weather fruit crop, others things being equal, was the grape.

All in all, the 1913 fruit exhibit at the state fair was one that under the adverse weather conditions brings out the fact that Nebraska, no matter how bad a drouth, will still come out and make a creditable showing in fruit, and furthermore points to the great horticultural possibilities of the eastern part of the state.

Owing to some misunderstandings only two florists of the state, Sinton & Pence, of Falls City, and Chapin Bros., of Lincoln, had potted plants on exhibition.

The first-named firm won most of the first premiums awarded. The other florists failing to come out and take up all the space, the University of Nebraska very generously consented to allow the society the use of

their greenhouse plants to fill up one wing of the building, and altogether made a very creditable plant show. The cut flower show was up to former years in quantity and quality.

PREMIUMS AWARDED AT STATE FAIR, 1913.

Apples.

Class 1, Lot 1, Ind. Collections—

- 1st—Marshall Bros., Arlington, \$25.
- 2d—Chas. B. Camp, Cheney, \$20.
- 3d—Velvick & Whittaker, Brownville, \$15.
- 4th—G. S. Christy, Johnson, \$10.
- 5th—Val Keyser, Fairbury, \$5.

Class 1, Lot 2, County Collective—

- 1st—Hesseltine & Christy, Nemaha, \$30.
- 2d—Marshall Bros., Washington, \$25.
- 3d—R. C. Chambers, Lancaster, \$20.

Class 1, Lot 3, Collections, 5, 10, and 50 Plates—

Collection 5 varieties summer apples.

- 1st—Marshall Bros., Arlington, \$5.
- 2d—Ray W. Hesseltine, Peru, \$3.
- 3d—Velvick & Whittaker, Brownville, \$2.

Collection 5 plates, 5 varieties fall apples—

- 1st—Val Keyser, Fairbury, \$5.
- 2d—Marshall Bros., Arlington, \$3.
- 3d—Velvick & Whittaker, Brownville, \$2.

Collection 10 plates, 10 varieties fall apples—

- 1st—Marshall Bros., Arlington, \$8.
- 2d—Velvick & Whittaker, Brownville, \$5.
- 3d—Duncan & Hesseltine, Peru, \$3.

Collection 50 plates summer or fall apples, display and condition to rule—

- 1st—Ray W. Hesseltine, Peru, \$10.
- 2d—Frank Williams, Tecumseh, \$7.
- 3d—Velvick & Whittaker, Brownville, \$5.

Collection 50 plates summer and fall apples, score card—

- 1st—Marshall Bros., Arlington, \$10.
- 2d—Velvick & Whittaker, Brownville, \$7.
- 3d—Val Keyser, Fairbury, \$5.
- 4th—Duncan-Hesseltine, F. & N. Co., Peru, \$3.

Class 1, Lot 4, (Single Plates), 1st \$2, 2d \$1—

Arkansas—

- 1st—Abe Lawrence, Brownville.
- 2d—G. S. Christy, Johnson.

Ben Davis—

1st—Ray W. Hesseltine, Peru.

2d—W. Sibering, DuBois.

Benoni—

1st—Velvick & Whittaker, Brownville.

2d—Marshall Bros., Arlington.

Coopers' Early White—

1st—Peru Fruit Farms, Peru.

Cole's Quince—

1st—Marshall Bros., Arlington.

Chenango Strawberry—

1st—Ray W. Hesseltine, Peru.

2d—Marshall Bros., Arlington.

Duchess (Oldenburg)—

1st—Marshall Bros., Arlington.

2d—Ray W. Hesseltine, Peru.

Dominie—

1st—Marshall Bros., Arlington.

2d—Velvick & Whittaker, Brownville.

Dyer—

1st—Marshall Bros., Arlington.

Ea. Pennock—

1st—Marshall Bros., Arlington.

2d—Val Keyser, Fairbury.

Eng. Golden Russet—

1st—Val Keyser, Fairbury.

2d—Marshall Bros., Arlington.

Fallwater—

1st—Val Keyser, Fairbury.

2d—Marshall Bros., Arlington.

Fall Orange—

1st—Duncan & Hesseltine, F. & N. Co., Peru.

2d—Velvick & Whittaker, Brownville.

Fall Wine—

1st—Marshall Bros., Arlington.

Fall Winesap—

1st—Frank Williams, Tecumseh.

2d—Val Keyser, Fairbury.

Fameuse—

1st—Velvick & Whittaker, Brownville.

2d—Val Keyser, Fairbury.

Gano—

1st—Val Keyser, Fairbury.

2d—W. Sibering, DuBois.

Grimes Golden—

1st—Velvick & Whittaker, Brownville.

2d—R. B. Duncan, Peru.

Genet—

1st—Val Keyser, Fairbury.

2d—Velvick & Whittaker, Brownville.

Haas—

1st—Velvick & Whittaker.

2d—Marshall Bros., Arlington.

Jonathan—

1st—Ray W. Hesseltine, Peru.

2d—Velvick & Whittaker, Brownville.

Maiden Blush—

1st—Val Keyser, Fairbury.

2d—Duncan-Hesseltine, Fruit and Nursery Co., Peru.

Mann—

1st—Marshall Bros., Arlington.

2d—Val Keyser, Fairbury.

Minkler—

1st—Val Keyser, Fairbury.

2d—Frank Williams, Tecumseh.

Missouri Pippin—

1st—G. S. Christy, Johnson.

2d—Marshall Bros., Arlington.

McMahon White—

1st—Marshall Bros., Arlington.

Northern Spy—

1st—(No awards).

N. W. Greening—

1st—Ray W. Hesseltine, Peru.

2d—Marshall Bros., Arlington.

Paragon—

1st—Ray W. Hesseltine, Peru.

Plumbs Cider—

1st—Velvick and Whittaker, Brownville.

2d—Marshall Bros., Arlington.

Princes Sweet—

1st—Velvick & Whittaker, Brownville.

2d—Duncan-Hesseltine Fruit & Nursery Co., Peru.

Perry Russet—

1st—Velvick & Whittaker, Brownville.

Pewaukee—

1st—Val Keyser, Fairbury.

2d—Velvick & Whittaker, Brownville.

Pound Sweet—

1st—R. F. Chambers, Bennet.

Ramsdell Sweet—

1st—R. F. Chambers, Bennett.

2d—Marshall Bros., Arlington.

Rome Beauty—

1st—G. S. Christy, Johnson.

2d—Val Keyser, Fairbury.

Salome—

1st—Marshall Bros., Arlington.

2d—R. F. Chambers, Bennet.

Senator—

1st—Ray W. Hesseltine, Peru.

Talman's Sweet—

1st—Duncan-Hesseltine F. & N. Co., Peru.

Trenton Early—

1st—Velvick & Whittaker, Brownville.

Utter—

1st—Marshall Bros., Arlington.

2d—Duncan-Hesseltine F. & N. Co.

Va. Beauty—

1st—Marshall Bros., Arlington.

2d—Velvick & Whittaker, Brownville.

Warfield—

1st—Peru Fruit Farm, Peru.

Westfield (Seek-no-further)—

1st—Marshall Bros., Arlington.

Willow Twig—

1st—G. S. Christy, Johnson.

Winesap—

1st—G. S. Christy, Johnson.

2d—Marshall Bros., Arlington.

Wealthy—

1st—Duncan-Hesseltine F. & N. Co., Peru.

2d—Velvick & Whittaker, Brownville.

Windsor—

1st—Marshall Bros., Arlington.

Wolf River—

1st—Velvick & Whittaker, Brownville.

Yellow Transparent—

1st—Marshall Bros., Arlington.

2d—Ray W. Hesseltine, Peru.

York Imperial—

1st—A. G. Shubert, Shubert.

2d—Velvick & Whittaker, Brownville.

Single Plates, 1st \$1, 2d \$0.50—

American Golden Russet—

1st—Val Keyser, Fairbury.

Arkansas Black—

1st—A. G. Shubert, Shubert.

2d—Ray W. Hesseltine, Peru.

Autumn Swaar—

1st—Frank Williams, Tecumseh.

Colvert—

1st—Velvick & Whittaker, Brownville.

Day—

1st—R. F. Chambers, Bennet.

Ingram—

1st—Velvick & Whittaker, Brownville.

2d—Duncan-Hesseltine Fruit & Nursery Co., Peru.

Iowa Blush—

1st—Val Keyser, Fairbury.

2d—Marshall Bros., Arlington.

Isham Sweet—

1st—Marshall Bros., Arlington.

Lansingburg—

1st—Velvick & Whittaker, Brownville.

Lawver—

1st—A. G. Shubert, Shubert.

2d—Val Keyser, Wyoming.

L. Red Romanite—

1st—Velvick & Whittaker, Brownville.

2d—G. S. Christy, Johnson.

Lowell—

1st—Duncan-Hesseltine F. & N. Co., Peru.

2d—Velvick & Whittaker, Brownville.

McIntosh—

1st—Velvick & Whittaker, Brownville.

2d—R. F. Chambers, Bennet.

Milam—

1st—Marshall Bros., Arlington.

Ortley—

1st—Marshall Bros., Arlington.

Porter—

1st—Velvick & Whittaker, Brownville.

2d—Duncan-Hesseltine F. & N. Co., Peru.

Rambo—

1st—Velvick & Whittaker, Brownville.

2d—Ray W. Hesseltine, Peru.

Red Astrachan—

1st—Duncan-Hesseltine F. & N. Co., Peru.

2d—Marshall Bros., Arlington.

Red June—

1st—Velvick & Whittaker, Brownville.

2d—Marshall Bros., Arlington.

Roman Stem—

1st—Velvick & Whittaker, Brownville.

2d—Marshall Bros., Arlington.

Sheriff—

1st—Marshall Bros., Arlington.

2d—Chas. B. Camp, Cheney.

Sops of Wine—

1st—Duncan Hesseltine F. & N. Co., Peru.

Summer Queen—

1st—Marshall Bros., Arlington.

Sweet June—

1st—Ray W. Hesseltine, Peru.

2d—Velvick & Whittaker, Brownville.

Wagner—

1st—Val Keyser, Fairbury.

Walbridge—

1st—Marshall Bros.

2d—Val Keyser, Fairbury.

White Winter Pearmain—

1st—Val Keyser, Fairbury.

2d—G. S. Christy, Johnson.

Wyeth—

1st—Marshall Bros., Arlington.

2d—No award.

Yellow Bellflower—

1st—Val Keyser, Fairbury.

2d—Frank Williams, Tecumseh.

Hyslop Crab Apple—

1st—Fred Schnitter, Raymond.

2d—Chas. Ludlow, Red Cloud.

Black Ben Davis—

1st—Chas. Ludlow, Red Cloud.

Delicious—

1st—Chas. Ludlow, Red Cloud.

Hybernal—

2d—Marshall Bros., Arlington.

Huntsman's Favorite—

1st—Marshall Bros., Arlington.

Livingston—

1st—Marshall Bros., Arlington.

Sweet Pear—

1st—Marshall Bros., Arlington.

Florence—

1st—Ray W. Hesseltine, Peru.

2d—R. B. Duncan, Peru.

Siberian Crab Apple—

1st—Velvick & Whittaker, Brownville.

Williams' Favorite—

2d—Velvick & Whittaker, Brownville.

Spice Apple—

2d—Velvick & Whittaker, Brownville.

Whitney No. 20—

1st—J. M. Cannon, Atkinson, Nebr.

Pears.**Class 1, Lot 5—**

50 plates pears any variety, display and condition to rule—

1st—Ray W. Hesseltine, Peru, \$12.

2d—Velvick & Whittaker, Brownville, \$8.

3d—C. H. Barnard, Table Rock, \$5.

Collection Nebraska grown pears—

1st—Velvick & Whittaker, Brownville, \$6.

2d—G. S. Christy, Johnson, \$3.

3d—C. H. Barnard, Table Rock, \$2.

Class 1, Lot 5 (Single Plates), 1st \$2, 2d \$1—**Flemish Beauty—**

1st—Ray W. Hesseltine, Peru.

2d—Arnold Martin, DuBois.

Bartlett—

1st—Ray W. Hesseltine, Peru.

2d—C. H. Barnard, Table Rock.

Clapp's Favorite—

1st—C. H. Barnard, Table Rock.

2d—J. R. Huffman, Auburn.

Seckel—

1st—W. Sibling, DuBois.

2d—Arnold Martin, DuBois.

Duchess d'Angouleme.

1st—Velvick & Whittaker, Brownville.

2d—Arnold Martin, DuBois.

Kieffer—

1st—Velvick & Whittaker, Brownville.

2d—G. S. Christy, Johnson.

Louise B. de Jersey—

1st—Marshall Bros., Arlington.

2d—G. S. Christy, Johnson.

Beaurre Hardy—

1st—Arnold Martin, DuBois.

2d—W. Sibling, DuBois.

Sheldon—

1st—C. H. Barnard, Table Rock.

2d—Abe Lawrence, Brownville.

Tyson—

1st—C. Grabenstein, Eustace.

2d—G. S. Christy, Johnson.

Garber—

1st—Ray W. Hesseltine.

Vermont Beauty—

1st—Ray W. Hesseltine, Peru.

Sudduth—

1st—G. F. Rolofson, Lincoln, R. F. D. 5.

Lincoln—

1st—C. H. Barnard, Table Rock.

Japan—

2d—G. S. Christy, Johnson.

Howell—

2d—Abe Lawrence, Brownville.

Ozark—

1st—Marshall Bros., Arlington.

Peaches.

Class 1, Lot 6—

Collection Nebraska grown peaches, not less than 5 varieties.

1st—A. G. Shubert, Shubert, \$6.

2d—G. S. Christy, Johnson, \$3.

3d—R. B. Duncan, Peru, \$2.

Class 1, Lot 6 (Single Plates), 1st \$2, 2d \$1—

Seedling Peaches—

1st—G. S. Christy, Johnson.

2d—Clara Ruch, University Place.

Alexander—

1st—G. S. Christy, Johnson.

Champion—

1st—Duncan-Hesseltine F. & N. Co., Peru.

Bokara No. 3—

2d—G. S. Christy, Johnson.

Crosby—

1st—G. S. Christy, Johnson.

2d—R. B. Duncan, Peru.

Elberta—

1st—G. S. Christy, Johnson.

2d—Abe Lawrence, Brownville.

Early Rivers—

1st—G. S. Christy, Johnson.

2d—Abe Lawrence, Brownville.

Heath's Cling—

2d—G. S. Christy, Johnson.

Russell—

1st—R. M. Bustard, Lincoln.

Salway—

2d—R. B. Duncan.

Triumph—

1st—Peru Fruit Farms.

2d—G. S. Christy, Johnson.

Wager—

2d—G. S. Christy, Johnson.

Crawford—

2d—R. B. Duncan, Peru.

Klondike—

1st—G. S. Christy, Johnson.

Matthew's Beauty—

1st—G. S. Christy, Johnson.

Carmen—

1st—Peru Fruit Farm, Peru.

Greensborough—

1st—Velvick & Whittaker, Brownville.

2d—Peru Fruit Farms.

Wright's Seedling—

1st—G. S. Christy, Johnson.

2d—Abe Lawrence, Brownville.

Plums.

Class 1, Lot 7—

Collection Nebraska grown plums not less than 5 varieties—

1st—L. O. Williams, University Place, \$5.

2d—W. F. Sidders, Lincoln, \$3.

3d—J. R. Davidson, Aurora, \$2.

Class 1, Lot 7 (Single Plates), 1st \$2, 2d \$1—

Burbank—

1st—H. W. Welkenkamp, Eagle.

2d—Albert Wellenkamp, Havelock R. F. D.

Forest Garden—

2d—Marshall Bros., Arlington.

German Prune—

1st—W. W. Bruce, Lincoln.

Lombard—

1st—John P. Sampson, 2992 Orchard St.

2d—W. F. Sidders, Lincoln.

Wyant—

1st—R. F. Chambers, Bennet.

2d—J. M. Packwood, Lincoln.

Hawkeye—

1st—Marshall Bros., Arlington.

2d—W. F. Sidders, Lincoln.

Miner—

1st—W. F. Sidders, Lincoln.

2d—Marshall Bros., Arlington.

Swiss Plum—

1st—Mrs. R. C. Adkins, 1525 No. 31st St., Lincoln.

Delicious—

1st—W. F. Sidders, Lincoln.

No. 5—

1st—W. F. Sidders, Lincoln.

No. 7 (Golden Rod)—

2d—W. F. Sidders, Lincoln.

DeSoto—

1st—J. M. Packwood, Lincoln.

2d—Marshall Bros., Arlington.

Gold—

1st—Abe Lawrence, Brownville.

Big Ben—

1st—W. F. Sidders, Lincoln.

Perfection—

1st—W. F. Sidders, Lincoln.

Floral Awards.

Collection Greenhouse Plants—

1st—Simanton & Pence, Falls City, \$45.

2d—Chapin Bros., Lincoln, \$40.

5 Specimen Palms—

1st—Simanton & Pence, Falls City, \$15.

2d—Chapin Bros., Lincoln, \$10.

12 Tuberoses—

1st—Chapin Bros., Lincoln, \$3.

Collection Ferns—

1st—Simanton & Pence, Falls City.

2d—Chapin Bros., Lincoln, \$10.

Collection Palms—

1st—Simanton & Pence, Falls City, \$20.

2d—Chapin Bros., Lincoln, \$15.

Collection Rex Begonia—

1st—Simanton & Pence, Falls City, \$5.

Collection Flowering Begonia—

1st—Simanton & Pence, Falls City, \$5.

Pair Hanging Baskets—

1st—Simanton & Pence, Falls City, \$5.

2d—Chapin Bros., Lincoln, \$3.

Collection Geraniums—

1st—Chapin Bros. Lincoln, \$10.

2d—Simanton & Pence, Falls City, \$8.

New and Rare Plants—

1st—Simanton & Pence, Falls City, \$5.

2d—Chapin Bros., Lincoln, \$3.

Collection and Display Cut Flowers—

1st—Chapin Bros., Lincoln, \$15.

2d—L. Henderson, Omaha, \$10.

3d—Simanton & Pence, Falls City, \$5.

Vase 50 Roses—

1st—L. Henderson, Omaha, \$8.

2d—Chapin Bros., Lincoln, \$5.

3d—Simanton & Pence, Falls City, \$3.

Display Gladiolus—

1st—Chapin Bros., Lincoln, \$5.

2d—L. Henderson, Omaha, \$3.

3d—Simanton & Pence, Falls City, \$2.00.

Vase Carnations—

1st—L. Henderson, Omaha, \$5.

2d—Chapin Bros., Lincoln, \$3.

Floral Design—

1st—L. Henderson, Omaha, \$30.

2d—Simanton & Pence, Falls City, \$25.

Special—Mrs. J. P. Sampson, Lincoln, \$3.

Basket Cut Flowers—

1st—Simanton & Pence, Falls City, \$8.

2d—Chapin Bros., Lincoln, \$5.

3d—L. Henderson, Omaha, \$3.

4th—Mrs. John P. Sampson, Lincoln, \$2.

16-inch Wreath—

1st—L. Henderson, Omaha, \$10.

2d—Simanton & Pence, Falls City, \$8.

3d—Chapin Bros., Lincoln, \$6.

Vase Cut Flowers (Discretionary)—

1st—Mrs. Rymer, Lincoln, \$1.50.

Potted Plants (Discretionary)—

Mrs. A. J. McClain, Sprague, 75 cents.

Grapes.

Class 2, Lot 1—

Collection of grapes, not less than 10 varieties, 5 clusters each—

1st—Chas B. Camp, Cheney, \$15.

2d—Peru Fruit Farm, Peru, \$10.

3d—J. R. Huffman, Auburn, \$5.

Five varieties for market. Profit to rule.

1st—Chas. B. Camp, Cheney, \$3.

2d—W. F. Sidders, Lincoln, \$2.

Five varieties for table. Quality to rule—

- 1st—J. R. Huffman, Auburn, \$3.
 2d—Velvick & Whittaker, Brownville, \$2.
 3d—Peru Fruit Farm, Peru, \$1.

Class 2, Lot 1 (Single Plates), 1st \$2, 2d \$1—

Agawam—

- 1st—M. A. Schmale, Emerald.
 2d—J. R. Huffman, Auburn.

Brighton—

- 1st—Chas. B. Camp, Cheney.
 2d—Peru Fruit Farms, Peru.

Campbell's Early—

- 1st—Peru Fruit Farms, Peru.

Camp's Early—

- 2d—Chas. B. Camp, Cheney.

Concord—

- 1st—J. R. Huffman.
 2d—W. F. Sidders, Lincoln.

Cottage—

- 2d—Velvick & Whittaker, Brownville.

Delaware—

- 1st—Chas. B. Camp, Cheney.
 2d—Berlin & Son, Brownville.

Duchess—

- 2d—Peru Fruit Farms, Peru.

Elvira—

- 1st—Chas. B. Camp, Cheney.
 2d—R. F. Chambers Bennett.

Empire State—

- 1st—Peru Fruit Farms, Peru.

Herbert—

- 1st—Chas. B. Camp, Cheney.

Jefferson—

- 1st—Peru Fruit Farms, Peru.

Lindley—

- 1st—Peru Fruit Farms, Peru.

Majestic—

- 1st—Chas. B. Camp, Cheney.

Moore's Diamond—

- 1st—Peru Fruit Farms, Peru.
 2d—J. R. Huffman, Auburn.

Moore's Early—

- 1st—J. R. Huffman, Auburn.
 2d—W. F. Sidders, Lincoln.

Niagara—

- 1st—Chas. B. Camp, Cheney.
 2d—R. M. Bustard, Lincoln.

Perkins—

1st—Chas. B. Camp, Cheney.

Pocklington—

1st—J. R. Huffman, Auburn.

2d—Peru Fruit Farms, Peru.

Rival—

1st—Chas. B. Camp, Cheney.

Telegraph—

1st—Chas. B. Camp, Cheney.

Woodruff Red—

1st—Berlin & Son, Brownville.

2d—J. R. Huffman, Auburn.

Worden—

1st—Berlin & Son.

2d—J. R. Huffman, Auburn.

Wyoming Red—

1st—Chas. B. Camp, Cheney.

2d—Berlin & Son, Brownville.

Adah—

1st—C. B. Camp, Cheney.

Crecius—

1st—C. B. Camp, Cheney.

Camp's Golden—

1st—C. B. Camp, Cheney.

Ernest—

1st—C. B. Camp, Cheney.

Goethe—

1st—Velvick & Whittaker, Brownville.

WOMEN'S RIGHTS IN HORTICULTURE.

Response by Mrs. R. A. Burns, Geneva, at Horticultural Society Banquet, Lincoln, January 21, 1913.

This subject was given to me by a man;
I'm not fond of speech-making, but I'll do what I can
To convince you, dear friends, 'tis not nature faking
When woman a place in Horticulture is taking.

If you will the pages of history scan
You'll find woman the first with horticultural plan;
For wasn't an apple in the Garden of Eden
Gathered by Eve, the mother of women?

We are told its beauty attracted Eve,
Its quality probably fed Adam's greed.
'Twas only an apple, served a la mode
The basis of this Horticultural episode.

But it shows quite plainly Eve was the one
Who started this Horticultural fun.
She created an interest in apples then,
Still keenly felt by all you men.

The Horticultural Rights of Woman?
Seems to me 'tis amply proven
She founded the business—she created demand
Which men supply the best they can.

REPORT FROM NEBRASKA.

At the Convention of the Society of American Florists, Held at Minneapolis, August 20.

Lewis Henderson, State Vice-President.

As vice-president of your society for the state of Nebraska, I take pleasure in submitting the following report from that state, which, less than forty years ago, was designated upon the maps of the school geographies of our country as the "Great American Desert." But things have changed and are steadily improving each year, and this once desert region is now considered the garden center of our great country.

To the florist and horticulturist is greatly due the credit of this wonderful change, attributed to the refining and beautifying and inspiring influence of flowers; to the planting of flowers and trees and ornamental horticulture in every city, town and hamlet of our state.

The flowers have done more for the upbuilding of the state than words can tell. They suggest by their silent beauty a home content, as if to say, What is the use of leaving our state of Nebraska for California or other states which are considered lands of flowers, when we have or can have the same right here in our midst? Our soil is just as productive as any under the sun. Our parks and boulevards just as refreshing, and the fragrance of the roses just as sweet. Our florists have worked hard, and any one who has been in the business for years knows there is a lot of work connected with the same to be a successful florist.

It gives me very great pleasure to report from information received from over the state that the year has been a very prosperous one in the various lines of floriculture. Each one has made some improvements and each proprietor is more prosperous and has more time for pleasure than in other years.

The demand for cut flowers is greatly on the increase for weddings and receptions as well as for use in the sick room and at funerals.

The State Horticultural show held last year at Lincoln was very creditable to the florists and a fine display was made both in cut flowers and plants. To the Nebraska State Florists' Society is greatly due the credit for the interest taken in these various shows in conjunction with the Horticultural Society.

The Omaha Florists' Club which meets once a month in Omaha, has done some good work the past year in a social way in creating good fellowship among the florists as well as some relief work during the spring, when we had the misfortune to be struck by one of the most disastrous tornadoes in the history of the country, but luckily there were not many florists damaged.

I wish to extend thanks to the various contributors in the East as well as those locally who gave to the relief fund of Mr. H. Jensen, whose home and greenhouses were totally wrecked by the tornado, but which

have since been replaced. Nebraska has also escaped many destructive hail storms.

It is also a matter for gratification that the hand of death has been laid less heavily on the members of the craft in the state. Still, it is my painful duty to record the passing away of Mrs. E. E. Arnold of Omaha, a beloved lady who took an active interest in floriculture; also Mr. A. DeLanney, one of the pioneer florists of South Omaha, who died very suddenly this summer.

The interest shown in the S. A. F. is growing stronger each day. We hope to make this convention the largest so far in attendance and membership, and we will all welcome the S. A. F. and its friends to Nebraska whenever they can come.

WISCONSIN HORTICULTURE.

(By G. A. Marshall, delegate to Wisconsin State Horticultural Society summer meeting, held at Bayfield, Wisconsin, August 21-22, 1912).

By consulting the map, you will see that Bayfield is located on a peninsula extending north out into Lake Superior. This locality is peculiarly adapted to fruit growing for the following reasons:

First: The deep waters of the lake on the west, north and east temper the winter blasts and we find the mercury does not register nearly so cold as it does way south of there, yet it being north, causes the winter to be steady and cold enough so the fruit buds remain entirely dormant until quite late in the spring and by the time blossoms are opened, summer seems to be on. Then, to add to this protection, these same lake waters temper the climate and almost eliminate the danger of freezing at blossom time. Here, we find fruit trees coming into bearing very young, some varieties of cherry fruiting heavily the second or third year after planting and apples showing a good will even before the tree is large enough to hold up a peck of apples.

This locality is extremely fine for all kinds of small fruits, blackberries, raspberries, strawberries, currants, etc., and all mature to perfection and produce good, profitable yields. The season is too short, however, to mature the late keeping apples such as Winesap, Black Twig Janet, etc. The varieties which do best there seem to be the Russians and others of the summer and autumn apples generally of a light color and somewhat light weight varieties. Duchess, Yellow Transparent, Wealthy, etc., thrive to perfection.

Sturgeon Bay is another protected place. Here fruit growing is much further advanced than at Bayfield, and is found very satisfactory and profitable in general. Wisconsin as a state however, has a varied climate and requires a great deal of study and experimenting and courage to bring fruit growing to its own over the state generally, yet they like we here in Nebraska, have an army of optimists and through this horticultural society and other channels, are slowly but surely working

their way to the front and are entitled to a great deal of credit for their persistent labor. Wisconsin is well up with other states of its age and their horticultural society surely deserves its share of the credit.

The meeting at Bayfield was well attended and a considerable amount of enthusiasm was shown.

MINNESOTA HORTICULTURAL MEETING.

C. S. Harrison, Delegate from Nebraska Horticultural Society.

I am a member of the Massachusetts Horticultural Society, also life member of the Nebraska and Minnesota state societies. I have had the pleasure of attending such gatherings in many states, but I never saw such earnestness and enthusiasm as you meet at this gathering. It is the largest in the nation if not in the world. It has over 3,000 members.

You seek for the causes which have led to such splendid success, and you find them in the officers who plan so wisely and judiciously. A. W. Latham, the secretary, is a man of great ability for planning and organizing. The directors cooperate with him. The members are willing to be led with such master minds to lead them, and there is no strife and fault-finding such as you often find in other societies.

I settled in Minnesota in 1857. I was there when the state was born. We no more expected to raise apples than oranges. It seemed an utter impossibility. The story of the early struggles is a story of disaster and defeat. Orchard after orchard was planted only to be cut down by a severe winter. Old Boreas said, "This is my realm, and you shall not invade it." The gauntlet was thrown down and men of iron took it up. They built an ironclad apple from the ground up, and now they have won. After one of the severest winters known there is a splendid showing of fruit. New and hardy kinds are all the while being produced. The Wealthy is a wonderful apple. Some were taken from Minnesota to the great apple show of the West and they won, much to the chagrin of the westerners. Apples grown in Minnesota are of the richest flavor, far surpassing in quality the western apple. And if one is going to raise this kind of fruit he had better try Minnesota; first, because good land for orcharding can be bought for \$50 per acre; second, an immense freight bill can be saved; third, you grow apples in the heart of a great want where your fruit will find ready sale; fourth, you will have fruit and quality and of superior and luscious flavor.

You have no conception of the hard work, the experimenting, and the persistence with which the great variety in apple growing has been won; and the annual gatherings with their intense interest are indications of the joy and triumph over difficulties supposed to be insurmountable.

Great interest has been manifested over other fruits. We see plum enthusiasts, who, from the native plum, have evolved wonders in size

and quality. One man, an artist by profession, who spends his winters in Washington, D. C., where he paints thousand dollar portraits, has a farm of 1,500 acres in the cut-over sandy lands of Minnesota. He has spent fifteen summers there and has given his attention to creating a hardy and luscious plum and now is receiving his reward in large crops of large fruit which sell readily at \$2 per bushel, and he can hardly touch the demand.

Mr. Penning of New Ulm has given the best part of his life in improving this fruit. He is an enthusiastic German, and when he gets agoing he is a regular cyclone, and his mouth is hardly big enough to pour out his torrent of enthusiasm. He raises hundreds of bushels and gets his \$2 per bushel for them.

In the meeting great interest was shown in a new race of ever-bearing strawberries which were found to be very prolific and profitable. They must have peculiar treatment. The buds must all be picked off until July and August, and then they are let go, and the result is great crops until frost comes. This department of horticulture is now securing much attention; for strawberries out of their normal season bring large prices, and we do not wonder at the keen interest taken in their production.

TOP GRAFTING.

When scions of tender trees are grafted on a hardy stock, like Virginia Crab or Hibernial, they can be grown 300 miles further north than when grafted on common roots. One man bought ten Missing Link apples and planted them. Every one died. He took the precaution of grafting on the Hibernial and all lived and are bearing immense crops. The northern pioneers have had to feel their way along through thousands of experiments until now they have a sure foundation.

Probably the finest orchard in the world was that of Mr. Phillips of northern Wisconsin. He was obliged to sell it on account of old age. The man who bought it knew nothing about fruit. In the fall the ground was covered with splendid, large and perfect apples. He let the neighbors come in and take off double wagon loads for a dollar a load. Later fruit buyers came in and took his winter apples at a good price. Probably at no time on earth was there such a marvelous crop of splendid fruit from such a number of trees.

The northern men have taught us a lesson. First, get ironclad roots for a hardy stock, top graft on these trees and you have both hardiness and abundance. We must study economy in orcharding. The ordinary cheap twenty-five-cent tree takes up both time and room, and in nine cases out of ten gives us nothing. A first-class apple tree, double worked, should cost about 50 to 75 cents. In ten years one tree will be worth about ten cents and the other \$10.

ORNAMENTALS.

Minnesota is drifting away from the pioneer stage and now active florist societies are being formed. Years ago the peony had a struggle for recognition, but now it is at the front, for both soil and climate are congenial.

The iris is the coming flower. It is such a drouth and cold resistant and succeeds so admirably and is of such radiant beauty its charms are irresistible. It is hard to break the ice and get people to recognize their value. But the lovers of the beautiful are waking up, and the call for them is growing. There is room for millions of them. One firm is selling 30,000 a year and expects soon to dispose of 100,000.

Some large firms are dropping fruit trees and taking up ornamentals, for the demand is growing. Eastern florists are flooding the land with attractive literature and reaping thousands of dollars which western growers should have.

HORTICULTURAL MEETINGS HELD BY NEBRASKA STATE HORTICULTURAL SOCIETY AND HORTICULTURAL DEPARTMENT OF UNIVERSITY OF NEBRASKA, FEBRUARY, 1913.

On February 17, the first meeting was held at Florence, Nebraska. There was a large attendance, owing in part to the fact that the Local Fruit Growers' Association of that place met the same day. After a short business session of the association, Mr. H. Nelson, the association manager, gave a short address, pointing out the possibilities of fruit growing and the necessity for better methods. Mr. C. G. Marshall, secretary of the State Horticultural Society, discussed the spraying of both trees and small fruits, and Mr. J. R. Cooper, assistant horticulturist of the State University, discussed pruning and general cultural methods for tree, vine and small fruits. A keen interest was shown throughout the discussion which was followed by talks by local fruit growers.

February 18 the institute was held at Nebraska City. No arrangements had been made by the local management so the meeting was held in the court house. The attendance was small because of the fact that the meeting had not been well advertised, but those present took great interest in the meeting. Mr. J. R. Cooper discussed pruning, spraying, and general cultural methods, illustrating his talk with charts. Mr. C. G. Marshall and Mr. Chas. Dickinson discussed methods and management of fruit growers' associations.

The meeting at Peru was well attended by fruit growers, state normal students and faculty members, classes being dismissed for the occasion. The same general program was followed as at the previous meetings with the addition of a packing demonstration given by Mr. Ray Hesseltine, and a pruning demonstration given by Mr. J. R. Cooper. During these demonstrations the liveliest interest was shown. A number of the faculty armed themselves with saws and assisted in the pruning demonstration.

The institute at Brownville on February 20 was a decided success, though the attendance was smaller than at Peru. A local association was in operation at this point and a lively discussion followed the talk on association management, given by Mr. Chas. Dickinson. The discussion of general methods and picking and packing given by Messrs. Cooper and Marshall was closely followed and many questions asked by those in attendance. No demonstration was given at this place for the reason that Mr. Cooper at a previous meeting, on the farm of Mr. Fred Lewis, devoted an entire day to the demonstration of modern methods.

On February 21 an institute was held at Shubert. The weather was very unfavorable and the attendance was small. The institute was especially well advertised by Shubert brothers, and despite the storm several men came out. The meeting assumed more of the nature of round-table discussions at this point and every one entered with spirit into the discussions.

On February 22, the last of the series of fruit institutes was held at Pawnee City. The weather was cold but bright and clear, and there was a large attendance. A great deal of interest was manifested in the discussions of Messrs. Marshall and Cooper on cultural methods, pruning, spraying, picking and packing fruit. Mr. Dickinson did not speak at this point.

With the formation of the Eastern Nebraska Fruit Growers' Association, a wider interest in being taken by fruit growers in general cultural methods, and picking and packing fruit. It should be possible and, I think, advisable to hold a larger series of fruit growers' institutes than has been held in the past. More stress should be laid on growing clean fruit and in making clean, honest, attractive packs. No one questions the quality of Nebraska fruit, but in order to cope with the competition from other regions it is necessary to have clean fruit, better grading and more attractive packs.

MISCELLANEOUS PAPERS

THE NEW HORTICULTURAL INSPECTION LAW OF NEBRASKA.

After years of waiting and being without adequate legal protection against unscrupulous persons in other states who might wish to unload their infested trees, vines, and plants on Nebraska planters, we now have a law that will adequately protect our planters and nurserymen. Nebraska has been the only state in the United States which did not have some sort of an inspection law on trees, vines and plants up to the last session of our legislature. On the following pages will be found the bill in full, as passed by the last legislature.

THE NEW HORTICULTURAL INSPECTION LAW OF NEBRASKA.

House Roll 171, Thirty-third Session of the Legislature of Nebraska.

An act to prevent the introduction into and dissemination of, and for the eradication within the state of Nebraska of dangerously injurious insects and plant diseases, by providing for the inspection of nursery stock, fruit, shade, ornamental and other trees, shrubs, and plants by the state entomologist or his assistant inspectors, by fixing fees for the same and to provide a penalty for the violation of this act.

Be it Enacted by the People of the State of Nebraska:

Section 1. That it shall be the duty of the state entomologist of Nebraska to seek out and suppress pernicious insect pests and injurious and contagious plant diseases destructive to the horticultural and agricultural interests of the state, and conduct experiments when necessary to accomplish that end.

Sec. 2. In order to accomplish the purposes of this act, the state entomologist, with his assistants and employees, is hereby authorized to enter upon any public premises, parks, cemeteries, or other premises, or upon any land of any firm, corporation, or private individual, within the state of Nebraska, for the purpose of inspection, destroying, treating, or experimenting upon the insects or diseases aforesaid. Should any insect or disease found by the state entomologist, or by any other officer appointed by him, be, in his opinion, capable of eradication without the destruction of the trees, plants, shrubs, or vines, then said officers are to treat or have treated, in order to prevent the dissemination of the aforesaid insects or diseases, any and all suspicious trees, vines, shrubs, or plants found to be in dangerous proximity to those infested as aforesaid.

Sec. 3. That should the officer aforesaid, through his assistants and employees, or by any notification whatsoever, find any trees, vines, shrubs,

or plants infested or diseased with the aforesaid insects or diseases, the aforesaid officer shall mark or tag in some conspicuous way all trees, vines, shrubs, or plants infested with the aforesaid insects or diseases, and shall give notice in writing to the owner or owners, tenants, or persons in charge of such premises of the condition thereof; and thereupon, if such person or persons so notified shall not, within ten days after notification, destroy or treat the same in accordance with regulations and rules of said officer, a copy of which will be sent on application to any person, then said officer shall, through his assistants or employees, destroy or treat all such trees, vines, shrubs, or plants. Whenever any such infestation shall exist at any place within or on the property of any non-resident, or on any property the owner or owners of which can not be found within the county after diligent search by the entomologist or his deputies, or on the property of any owner or owners upon which the notice aforesaid has been served, and who shall refuse or neglect to eradicate the same within the time specified, it shall be the duty of the state entomologist, or his duly authorized deputy, to cause said infestation to be at once removed by eradicating or destroying said plant diseases or injurious insects, their eggs or larvae. The necessary expense thereof shall be paid by the owner or owners of the real estate from which said infestation has been removed in pursuance of this act. The state entomologist or his deputy shall serve or cause to be served upon said owner or any one in possession and in charge of said real estate a notice stating the amount of said charge, and further stating that if said charge be not paid to the county treasurer of the county wherein said real estate is located, within twenty days from the date of the service of said notice, that the same will become a lien upon said real estate. Copy of said notice, together with the proof of service, shall be at once filed with the county clerk, and if said amount is not paid within the time therein stated, said county clerk shall spread the same upon the tax-roll prepared by him, and said amount shall become a lien against said real estate and be collected as other taxes are collected, and said real estate shall be sold for non-payment of said taxes the same as now or hereafter may be provided by law for sale of real estate for delinquent taxes. Should the owner of said real estate not pay said charges within the stated time, the same shall be presented to the board of county commissioners by the county clerk, and by them allowed and paid out of the general fund of the said county by the county treasurer, and when said amount is collected as taxes it shall be paid into the general fund of the said county. The cost of eradication or treatment of such infestation, as above stated, shall be paid to the county treasurer, to whom the county clerk shall certify all amounts due as reported to him by the state entomologist. The county treasurer shall forward to the state treasurer on the first of each month all amounts thus received. These amounts shall be paid into the general fund.

Sec. 4. That it shall be the duty of the state entomologist of Ne-

braska to inspect, or cause to be inspected by his duly appointed assistants, at least once each year, principally between July 1 and September 30, all nurseries and nursery premises known to him in the state of Nebraska, for the purpose of detecting dangerous insects and plant diseases, such as San Jose scale, Howard scale, browntail moth, gipsy moth, peach yellows, peach rosette or any similarly dangerous insect pests or diseases. If, upon the inspection of any nursery as above provided, it shall appear that said nursery and its premises are free from dangerous insects and plant disease, he shall, upon the payment of the expenses of inspection as hereinafter provided, send or give to the owner of said nursery, or, to the person in charge of same, a certificate of inspection stating that said nursery and premises are apparently free from such injurious insects and diseases. Said certificate shall be issued not later than October 1 and shall continue in force, unless revoked for cause as hereinafter provided, until the first day of July next following the date of inspection. If the state entomologist or his assistant inspectors shall find that a portion of a nursery is infested with dangerous insects or plant diseases and other portions are then free from infestation or infection, or if he shall have reason to believe that a nursery, on account of its proximity to infested or infected premises, is liable to become so infested or infected before the next annual inspection, he may prescribe in writing such measures of precaution or make in writing such conditions as to the use of his certificates as may in his judgment be necessary, and certificate may be withheld until such conditions have been accepted in writing by the owner of said nursery, and the use of said certificate without taking the required measures of precaution or observing such condition shall subject the owner of said nursery to the penalty prescribed in section 6 for a violation of this act.

Whenever any nurseryman or seller of trees, shrubs, vines, plants, buds, or cuttings commonly known as nursery stock, within the state of Nebraska, shall ship or consign for shipment such stock, each shipment shall bear a true copy of a valid certificate of the state entomologist of Nebraska or by another inspector duly approved by him, showing that the said stock has been given careful inspection and found apparently free from dangerous insects or plant diseases. Any person who shall deliver, ship, or consign for shipment nursery stock without such certificate attached, or who shall use such certificate in connection with nursery stock, any and every part of which has not been inspected and certified as aforesaid, or who shall alter or deface such certificate, shall be liable to the penalties prescribed in section 6 for a violation of this act.

The power to revoke and annul said certificate is hereby given the state entomologist if he shall find that his certificate of inspection has been used in violation of any of the provisions of this act. Revocation shall be through written notice to the holder of said certificate. The use of said certificate, after it has been revoked and annulled, and before such revocation has been withdrawn by the state entomologist shall subject the holder of said certificate to the penalties provided in section

6 for a violation of this act. It shall also be the duty of the state entomologist to inspect foreign importations in accordance with the federal plant quarantine act.

Nurserymen and dealers of Nebraska shall be privileged to ship, under the certificate issued to them, nursery stock grown for them elsewhere or purchased by them from other states or countries; provided that all such stock be received under certificates approved by the official inspector of the state where grown, stating that it has been inspected by him and found to be apparently free from dangerous insects and plant diseases.

On issuing his certificate after inspection of a commercial nursery, the state entomologist shall collect therefor a fee covering the expenses of inspection as certified by him, according to the amount of stock inspected, the time occupied, and the distance traveled in making such inspection; provided, that such fees be not less than five dollars nor more than twenty dollars, which shall be turned into the state treasury.

Sec. 5. Whenever any trees, shrubs, plants, or vines are shipped from place to place in Nebraska, or shipped into Nebraska from another state, county, or province, every such shipment shall be plainly labeled on the outside with the name of the consignor, the name of the consignee, and a certificate signed by a state or government inspector showing that the contents have been inspected by such inspector, or by his authority, since the first day of July last preceding, and that the trees, vines, shrubs, and plants there present and contained therein appear free from all dangerous insects and plant diseases. Whenever any trees, shrubs, vines, or plants are shipped as above without such certificate plainly affixed, the facts must be reported within twenty-four hours to the state entomologist by the railway, express, or steamboat company or other person or persons carrying the same, and it shall be unlawful to deliver any such property until it has been inspected by the state entomologist or his assistants and by him or them certified to be free from dangerous insects and plant diseases. Any agent of any railway, steamboat, or express company or other person or persons carrying such property as aforesaid, who shall fail to give such notice as above required shall be deemed guilty of a violation of this act.

Whenever nursery stock is shipped into Nebraska, covered by a valid certificate signed by other state or government inspectors, such certificates shall be held prima facie evidence of the facts therein stated, but the state entomologist or his assistants, upon suspicion that such stock might harbor dangerous insect pest or plant diseases, shall be authorized to inspect such stock, and if necessary subject it to proper treatment. Provided, that plants, flowers, or cuttings known as greenhouse stock and native stock collected in the United States and not grown in nurseries shall not be required to bear certificates of inspection for shipment except when coming from districts known to be infested by gipsy or brown-tail moths or other recognized dangerous insect pests.

Sec. 6. Any person who shall violate the provisions of this act with reference to the sale, shipment, delivery, or transportation of nursery stock, or with reference to the use, alteration, or defacement of a certificate relating to the same, or who shall remove, without the written permission of the state entomologist, infested or infected property concerning the condition of which he has received official notice from the state entomologist, or who shall offer any hindrance or resistance to the carrying out of this act, shall be adjudged guilty of a misdemeanor, and upon conviction before any court having jurisdiction shall be fined not less than \$10 nor more than \$100 for each and every offense, together with all costs and shall stand committed until the same is paid. The state entomologist shall furnish the prosecuting attorney with all information of matter coming to his knowledge constituting a violation of this act.

Sec. 7. The office and laboratories of the state entomologist shall be located at the University of Nebraska. He shall have power to appoint such qualified assistants as may be necessary to the execution of this act who shall be competent, scientific, and practical entomologists, and to fix a reasonable compensation for that labor, and their acts, done in pursuance of his instructions, shall have the same validity as his own. He shall pay over to the state treasurer all the funds coming into his hands under the provisions of section 4 of this act, with an itemized statement of the sources whence received.

Sec. 8. For the purpose of further obtaining and disseminating information concerning the life-history and habits, prevention, control, or extermination of dangerous insects or plant diseases, the state entomologist may conduct experiments, public spraying demonstrations, and from time to time publish and distribute bulletins and circulars containing such information as may be of value to the horticultural, agricultural, and other interests of this state.

P. C. KELLEY,

Speaker of House of Representatives.

Attest:

HENRY C. RICHMOND,

Chief Clerk House of Representatives.

S. R. McKELVIE,

President of Senate.

Attest:

CLYDE H. BARNARD,

Secretary of Senate.

Approved April 16th, 1913, 2:30 p.m.

JOHN H. MOREHEAD,

STATE OF NEBRASKA, [ss.

Governor.

I, Henry C. Richmond, Chief Clerk of the House of Representatives, hereby certify that the within bill originated in the House and passed the Legislature of the 33d Session on the 14th day of February, 1913.

HENRY C. RICHMOND,

Chief Clerk House of Representatives.

Received April 17, 1913.

ADDISON WAIT, Secretary of State.

SPRAYING APPLES AND GRAPES.

J. R. Cooper, Horticultural Dept., University of Nebraska.

The most serious annoyance of the fruit grower of today is the liability of attacks on his crops by insects and fungous diseases. The crops are few indeed which are not damaged by the depredations of some enemy, either insect or fungous. Especially is this true of orchard crops. This being the case, measures must be taken to combat these common enemies. There is no reason why, with the present knowledge of spraying and culture, the orchardist need fear these insect and fungous pests any more than the farmer fears the weeds which begin growing as soon as the crops are planted and with which he must wage unrelenting warfare if he is to realize any benefits from his labors. Clean culture and proper spraying with the right materials at the right time will protect the crops from insects and disease just as surely as good cultural methods will conserve moisture and protect the plants from weeds.

With the spraying season so close at hand, preparations should be made at once for the season's work. Machinery should be gone over to be sure that it is in perfect working order before time to begin spraying, and a full supply of spraying materials should be laid in. A delay of a few days, when it is time to spray, often means wormy and diseased fruit.

Success lies in knowing, first, what is causing the injury to the plants; second, the remedy for the trouble; and third, thorough treatment. We find many enemies which appear at different seasons of the year, work in different ways, and require different treatments; but by using good judgment in the combination of materials and in the time and manner of application of the same, these may all be controlled.

It is usually best to spray apples four times. The sprayings should be concentrated at the beginning of the season in such a manner that the foliage and fruit may be covered with a protective coat while young and tender, for it is at this time that disease spores are germinating and the young insects are making their attacks.

The first spraying with Bordeaux and arsenate of lead, bluestone three pounds, lime four pounds, arsenate of lead two pounds, fifty gallons of water, should be done just as the flower buds are turning pink and before they unfold. The spray should be applied as a very fine mist and only in large enough quantities to cover the foliage, branches, and trunks of the trees with a very thin film. If the spray is applied in coarse drops or in such large quantities that it collects and runs together, it is liable to burn both the fruit and foliage. This spray is intended to control apple scab, rust, curculio, canker and worms, bud moth and leaf feeders.

The second spraying with commercial lime and sulphur, and arsenate of lead, 1½ gallons lime and sulphur, 2 pounds lead, 50 gallons water, should be done between the falling of the petals and the closing of the calyx cups. It is best, if a large number of trees are to be sprayed, to begin operations when about three-fourths of the petals have fallen. For this application the spray should be coarse and delivered at very high

pressure (200 to 300 lbs.) from above the calyx cups, which at this time are standing upright and open ready to receive the liquid. This is the most important spray for the codling moth. It has been demonstrated that fully 80 per cent of the worms enter the apples, in unsprayed orchards, at the calyx end. The filling of these cups with poison will lessen the infestation just that much, besides lessening the number of second brood worms. This spray is intended to control codling moth, curculio, scab, rust and leaf feeders.

Lime and sulphur is preferred for the second spray because at this stage Bordeaux is liable to cause serious russeting of the fruit and burning of the foliage, unless it is very carefully mixed and applied as a very light mist.

The third spraying of commercial lime and sulphur, and arsenate of lead, $1\frac{1}{2}$ -2-50, should be done three to four weeks after the petals have fallen. This spray, like the first, should be applied as a fine mist. This application is intended for codling moth, curculio, scab, blotch, black rot, and bitter rot. By this time the fungicides will have been partly washed from the trees and the first brood of codling moth will be hatching.

The fourth spraying with Bordeaux and arsenate of lead, 3-4-2-50, or commercial lime and sulphur and arsenate of lead $1\frac{1}{2}$ -50, depending upon weather conditions, should be done eight to ten weeks after the blossoms fall, and should be applied as a fine mist. In case the weather is wet or muddy, lime and sulphur is the better spray to use; but in case of dry hot weather, Bordeaux gives better results, since under such conditions lime and sulphur is liable to burn both the fruit and foliage. This application is intended primarily for the second brood codling moth, but also for blotch, rust, bitter rot, and black rot. In case none of these diseases is present, the fungicide may be omitted from this spray. For the control of blotch on apples, Bordeaux gives better results than lime and sulphur.

Grapes should be sprayed three to six times, depending upon weather conditions and amount of infection. The first spraying of Bordeaux and arsenate of lead, 5-5-2-50 should be done when the flower buds are beginning to swell. The spray should be delivered as a fine mist under heavy pressure and should completely cover all parts of the plant. This treatment is for mildew, anthracnose, black rot, curculio, grape berry moth, flea beetles, and other leaf-eating insects.

The second spraying should be done just after the blossoms fall and should consist of the same materials and be applied in the same manner as the first spray.

The third spraying should be done when the fruit is about the size of small buckshot, and should consist of the same material as the first two sprays. If the weather is very damp, or if the vineyard is infested with black rot, it may be necessary to apply two or three more sprays at intervals of seven to ten days. Two to three weeks before the fruit begins to ripen a spray of neutral acetate of copper should be substituted for Bordeaux to avoid staining the fruit.

Lime and sulphur is injurious to the foliage of grapes and should not be used.

For leaf hoppers and other sucking insects, use tobacco extract, one part to seventy parts of water, or soap, eight pounds to fifty gallons of water and apply in the same manner as Bordeaux.

The things necessary in order to do a good job of spraying are, power and suitable pump, with the proper hose, extension rods and nozzles. For large areas a gasoline engine to furnish the power is indispensable. For orchards of less than 300 trees, pumps driven by hand are cheapest and most practical in most instances, though, in case of a scarcity of labor, the gas engine may prove most practical for smaller areas. On a large scale, everything else being equal, it costs a little more than half as much to spray with a gas engine outfit as by hand power.

From whatever source the power is derived, a good force pump is necessary. A satisfactory pump should have all parts which come in contact with the spraying material made of brass, which will not corrode; a large air chamber so that the liquid will be delivered in a steady stream rather than in a succession of spurts; all parts easily accessible for cleaning and strong enough to give good service.

There are many different nozzles in use. In selecting nozzles, choose those which do not clog easily, and which are readily cleaned. The "Frind" type of nozzle is among the best. The manner of delivering the spray is controlled by the size of the hole in the disks, and these may be changed at any time. Another advantage is that they do not catch easily on the branches of the trees.

THE APPLE PACKAGE AND GRADE BILL. SIGNED BY THE PRESIDENT, AUGUST 3, 1912.

The Sulzer Bill.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the standard barrel for apples shall be of the following dimensions when measured without distention of its parts: Length of stave, twenty-eight and one-half inches; diameter of head, seventeen and one-eighth inches; distance between heads, twenty-six inches; circumference of bulge, sixty-four inches outside measurement, representing as nearly as possible seven thousand and fifty-six cubic inches, provided that steel barrels containing the interior dimensions provided for in this Section shall be construed as a compliance therewith.

Sec. 2. That the standard grades for apples when packed in barrels which shall be shipped or delivered for shipment in interstate or foreign commerce, or which shall be sold or offered for sale within the District of Columbia or the Territories of the United States shall be as follows: Apples of one variety, which are well-grown specimens, hand picked, of good color for the variety, normal shape, practically free from insect and

fungous injury, bruises and other defects, except such as are necessarily caused in the operation of packing, or apples of one variety which are not more than 10 per centum below the foregoing specifications shall be "Standard Grade minimum size two and one-half inches," if the minimum size of the apples is two and one-half inches, in transverse diameter; "Standard Grade minimum size two and one-fourth inches," if the minimum size of the apples is two and one-fourth inches in transverse diameter; or "Standard Grade minimum size two inches," if the minimum size of the apples is two inches in transverse diameter.

Sec. 3. That the barrels in which apples are packed in accordance with the provisions of this Act may be branded in accordance with Section two of this Act.

Sec. 4. That all barrels packed with apples shall be deemed to be below standard if the barrel bears any statement, design or device indicating that the barrel is a standard barrel of apples, as herein defined, and the capacity of the barrel is less than the capacity prescribed by section one of this act, unless the barrel shall be plainly marked on end and side with words or figures showing the fractional relation which the actual capacity of the barrel bears to the capacity prescribed by Section one of this Act. The marking required by this paragraph shall be in block letters of size not less than seventy-two point one inch gothic.

Sec. 5. That barrels packed with apples shall be deemed to be misbranded within the meaning of this Act:

First.—If the barrel bears any statement, design or device indicating that the apples contained therein are "Standard Grade" and the apples when packed do not conform to the requirements prescribed by Section two of this Act.

Second.—If the barrel bears any statement, design or device indicating that the apples contained therein are "Standard Grade" and the barrel fails to bear also a statement of the name of the variety, the name of the locality where grown and the name of the packer or the person by whose authority the apples were packed and the barrel marked.

Sec. 6. That any person, firm or corporation, or association who shall knowingly pack or cause to be packed apples in barrels, or who shall knowingly sell or offer for sale such barrels in violation of the provisions of this Act, shall be liable to a penalty of One Dollar and costs for each such barrel so sold or offered for sale, to be recovered at the suit of the United States in any court of the United States having jurisdiction.

Sec. 7. That this Act shall be in force and effect from and after the first day of July, nineteen hundred and thirteen.

EXPLANATORY NOTES.

The Package.

The size of the barrel will be found in the first paragraph, and is now in general use in the barreled apple sections.

The Grade and Sizes.

These specifications are found in Section 3. There is but one grade. This grade is divided into three sizes governed by the minimum size of the apples in each grade. A limit of tolerance of ten per cent is provided to allow for errors in packing. This means that if you are not more than 10 per cent below the specifications, your pack is deemed up to the legal standard.

For example, if you pack your apples "STANDARD GRADE MINIMUM SIZE 2½ INCHES" then the apples in the barrel must be "apples of one variety, well grown specimens, hand picked, good color for the variety, normal shape, practically free from insect and fungous injury, etc." (See Sec. 2) or not more than 10 per cent below these specifications, and must not be less than 2½ inches in transverse diameter. They may be as much larger as you desire. Exactly the same principles apply to the 2½ inch and 2 inch size.

Branding.

All barrels marked "Standard Grade," etc., must also have branded upon them (1) the variety (2) the name of the locality where grown, (3) the name of the packer or person by whose authority the apples were packed and the barrel marked. (See 5, sub. second.)

The brand on the head of the barrel should read something like this:

Standard Grade		Standard Grade
Min. Size 2½ inches		Min. Size 2½ inches
Baldwin	or	Baldwin
Grown in Western New York		Grown and Packed by
Packed by John Jones		John Doe,
St. Louis, Mo.		Rochester, N. Y.

An opinion from the acting solicitor of the U. S. Department of Agriculture also advises us that the following or similar words may be used as a part of the brand: "Packed in Accordance with the Act of Congress approved August 3d, 1912."

These words may be worked into a small rubber stamp and should lend strength to the brand. As the law has not yet gone into effect, you are advised to use "Packed in Accordance with," etc., rather than "Packed Under the Act of Congress," etc.

Time of Taking Effect and Penalty.

The Act does not go into effect until next year, but the Solicitor advises that we are at liberty to pack, brand and act in Accordance with it RIGHT NOW. Also while the specific penalty prescribed in the bill may not attach until next year, yet all apples, no matter how marked, now fall under the power of the Food and Drug Acts. If you pack in the OLD way and brand the barrels Fancy or No. 1, etc., and the fruit does not conform to the brand, you still come squarely under the Food and Drugs Act.

You are, therefore, advised to see to it that all brands of every description are in accordance with the facts, whether you follow the Sulzer Bill or whether You Do Not.

Make the Law Alive.

"The way to do a thing is to do it." That was demonstrated in the passage of the bill. This act was supported and fought for by nearly every important grower's association in the United States and the most prominent individual growers, by state departments, chambers of commerce, the National Retail Grocers' Association, commercial bodies and three national trade associations, comprising every one from producer to consumer.

Now that we (growers, dealers and consumers) have all fought and won, are we going to retreat or march on? Are we going to preach one thing and practice another? Are we going to begin to cry, "We can't," or will we say, "We can and will?" Are we going to waste our time talking about "dead letters" and throwing cold water and piling up objections, or are we going to charge the ramparts and annihilate our ancient and deadly enemy J-U-N-K? Are we going to do something, act, stir ourselves, bring things to pass, or are we going to "Think about it" and "Put it off," and "wonder if we can," and continue to wallow in the same old slough of decayed fruit and dead hopes?

If we want to make this bill alive, and thereby abolish "Junk," establish confidence, improve markets, increase our exports, solve the problem of increased production, encourage the growing of better fruit, stimulate consumption and decrease the hazards, then let:

- [1] The grower sell and pack standard grade.
- [2] The dealer buy, pack and sell standard grade.
- [3] The consumer demand standard grade.
- [4] Everybody advertise standard grade.

Now, how are we going to do this? WHY DO IT. That's all—just do it—do it like we do anything else. We eat by eating—not by looking on and thinking about it.

If any man is afraid he can't grade according to size, buy a grading machine—there are plenty of them that will do the business. Don't be afraid. Fear never accomplished anything in the history of the world.

SAMPLE CONTRACT UNDER THE SULZER BILL.

THIS AGREEMENT, Made this.....day of....., 1912, WITNESSETH that John Jones of Winchester, Va., has sold to Richard Roe, of New York, N. Y., his crop of standard grade apples to be delivered at the railroad station at....., or at the..... storage at; said apples to be packed in standard barrels and graded according to the specifications established by the Act of Congress, approved by the President, August 3, 1912, and known as the Sulzer Apple Package and Grade Bill. Richard Roe agrees to pay therefor upon delivery as follows:

- (1) For standard grade minimum size $2\frac{1}{2}$ inches in the following varieties\$.....per Bbl.
- (1) For the same grade and size in the following varieties\$.....per Bbl.
- (2) For standard grade minimum size $2\frac{1}{4}$ inches in the following varieties\$.....per Bbl.
- (2) For the same grade and size in the following varieties\$.....per Bbl.
- (3) For standard grade minimum size 2 inches in the following varieties\$.....per Bbl.
- (3) For the same grade and size in the following varieties\$.....per Bbl.

Signed.....

On the reverse side or at the bottom may be printed Section 2 of the act and the further statement contained in Section 5, Subdivision 2, that the barrels must be branded with the name of the variety, the locality where grown and the name of the packer or person by whose authority the apples were packed. This contract is in its simplest form. Suitable blank spaces may be provided for the insertion of such other details as may be deemed necessary. Simplicity, however, is the best watchword.

HOME GROUNDS AND GARDENS.

W. H. Dunman, University Farm, Lincoln.

The amateur who is commencing to plan for the ornamentation of the grounds about his home must have a well-developed, intelligent plan. This is one of the essentials in landscape gardening. The ideal landscape is one of open spaces, pretty vistas, through a framework of trees, shrubs, and flowers. The chief features to which attention should be directed are the open space in front of the house, the limited number of large trees, and the shrubbery at the sides. The selection and correct arrangement of plants of growing things are important in the small place, but not the number of kinds that may be planted, a too comprehensive assortment of plants would be inappropriate for an ordinary city lot.

While the householder gladly puts \$3,000 to \$20,000 into his house, paying an architect \$100 to \$500 for planning the house, he does not think of consulting a landscape gardener to design the planting, but leaves such things to the man who mows the lawn or some other person not competent to do the work.

The first question to be decided in laying out the grounds for a moderate sized home is whether a fine effect from the street shall be sought or privacy be secured to the residents. The old English style of securing privacy is to have a thick, high hedge along the front, completely screening the house and grounds from the street. A modification of this method is to plant a somewhat irregular screen of mixed trees and shrubs. A good plan, and one I much prefer, is to make the plantings in irregular borders along the sides of the lot and at the back with a few shrubs and climbers against the porches and the foundation of the house. Mistakes especially to be avoided are formal beds in the front lawn, shrubs and trees scattered promiscuously over the area with no central idea. The object of landscape gardening is to make a picture. The lawn is the canvas, the house the central figure, the planting completes the composition and adds the color. Therefore, in planning your home grounds keep the center open, frame and mass the sides, and avoid scattering effects.

As to walks and drives, have them as few and short as possible. On a small place the approach may be straight and lead directly to the house. As walks and drives are a necessary evil, and do not add to the beauty of the place, they should then be designed to fit the actual demands of traffic about the place.

The lawn is the first practical consideration in a landscape garden. Great care should be used in preparing the ground for seeding a new lawn. Deep cultivation and the soil well enriched with barnyard or commercial fertilizers are essentials. The best grass for the foundation is Kentucky bluegrass, with redtop, Rhode Island bent, and white clover added for quick results. The easiest way to spoil a good lawn is to put a flower bed on it.

Next in importance to a good lawn is the shrubbery. These plants are seldom used too much, and it is on their association that the charm of the landscape mostly depends. For a small place, in my opinion, it is wrong to distribute the different species with which a bed is planted in small groups of one species only. The reason is this: the growth, form, and color of such groups being naturally different, the result obtained is far from presenting a harmonious whole. If space permits, delightful shrubberies may be planned. These plants irregularly grouped along the walls and massed in retreating angles of a building soften the sharp line when building and ground unite. Plant for immediate effect, as well as for future generations, buy good sized plants from your local grower if possible. Life is too short for mail order plants of most varieties. Insist upon the nurseryman sending what you order; here is where you can get satisfaction if a mistake has been made by dealing with the people in your own state. Do not expect to get plants as they are illustrated in

some catalogues. Send your order in early and plant as soon as the ground can be worked in the spring. Before mentioning some of the best shrubs and trees to get from your dealer, I want to make a plea for the hardy native shrubs and flowers. We often hear expressions of sympathy for the western prairie people because we can not grow some of the plants that do so well on the Atlantic coast. We may not be able to grow such plants as rhododendrons, kalmias and other evergreen shrubs, but what can be more beautiful than the wahoo or strawberry bush, with its bright red fruit in fall and winter? Perhaps you will order this from a catalogue under this long name (*Euonymus atropurpureus*) and think it better, when perhaps in a fifteen- or thirty-minute drive from your home you could dig up hundreds. The same thing with the Indian currant or coral berry; these plants hold their bright red berries till spring. What a blaze of scarlet you can have in fall with the sumac bushes, and in the winter the bright-colored bark of the dogwood or kinnikinnick. As a vine or shrub nothing is prettier than the bittersweet with its orange-colored berries during winter. And what a variety of native flowers we have from early spring till autumn. Who has not seen the prairies ablaze with painted cup, golden rod, aster, phlox, girardias and many others just as beautiful?

The following list of cultivated shrubs is adapted for this state except the extreme west. The first to bloom are the Forsythias (golden bells). The drooping variety *suspensa* is good for the foreground or covering an embankment or stone wall. May is the month for lilacs. Don't take the old nameless thing in your neighbor's garden because you can get it for nothing. Plant the newer varieties; the colors are better, flowers more freely and last longer. Here are the names of some worth growing: Marie Legraye, Rouge de Trianon, Pres. Grevy, Pres. Carnot, Ludwig Spaeth, Dr. Von Regel, Charles Joly, Alphonse Laval, Prince of Wales, Princess Alexandria, Pres. Massart, Louis van Houtte, De Croneels, and *coerulea superba*, the last named being sky blue, very pretty. One or two of the tree lilacs should be included in your list. Late May and June is the time for the spirea family. These shrubs are the best for landscape work, either as hedge plants, single specimens, or planted in masses. Commencing with *Spirea Arguta*, the earliest to flower in April, followed by *S. Prunifolia*, *S. Thumbergii*, and then by the best one of them all, *S. Van Houtii*, commonly called the bridal wreath. Where a single specimen of any shrub is needed this is the ideal plant, with its semi-pedulous habit of growth. Do not let the lawn mower man spoil this bush by cutting off the lower branches. The *Deutzias* can be grown by any one having a sheltered position; in July these are very pretty covered with white flowers. *D. Gracilis*, *Lemoninei*, and *Pride of Rochester* are good varieties. For August we have the smoke bush or sumach (*Rhus Cotinua*); pruned yearly, it can be kept within bounds. During the summer, when there is a scarcity of flowering shrubs, the hardy *Hydrangeas* are all the more striking. They give a succession of bloom from July till frost. They will grow in a partly shaded position, but the flowers will not be so highly colored and useful for interior decoration. This is

one of the few shrubs that can be pruned in the spring, as the flowers are borne on the young growths of the current year. *Hydrangea paniculata grandiflora* is the best one to grow. The *Viburnum* family should be in every collection because of their flowers, fruit, and autumn colors. *Viburnum opulis sterilis*, the old-fashioned snowball, in great demand about Decoration day; *Viburnum opulus*, the high bush cranberry, with its white flowers in June and highly colored fruit lasting on the bushes all through the winter months; *V. lentago*, and *Dentatum* are splendid varieties with their foliage and black berries in winter. For screening unsightly objects use the *Philadelphus* or mock orange, a strong, robust shrub. Another useful shrub for screening purposes is the tamarisk, with its feathery foliage and pink flowers. The Tartarian honeysuckle and *Rhodotypus kerrioides* are both good shrubs for ornamental work. Plants suitable for hedges are privet, barberries, the spirea, *Rosa rugosa*, and Japan quince. The best of these, and easily kept within bounds, is the common privet (*Ligustrum vulgare*).

SHRUBS NOT TO PLANT

Do not waste your time trying to grow *Rhododendrons*, *Althea*, or *Rose of Sharon*, as they are not to be depended upon for more than one or two seasons. The same is true of *Weigelia*s. Do not let a tree agent or nurseryman convince you that California privet is hardy for a hedge plant. If you do plant it, you will be sorry some spring after a severe winter.

Trees are sometimes able to make a whole landscape by themselves. There is hardly one of them that has not its own peculiar and sufficient beauty. Familiarity with trees and a sympathetic understanding of their habit and manner of growth is the best basis on which to make a selection suited for the home grounds. Many places, particularly in Lincoln, have twice the number of trees which the place ought to support. I am almost certain this is the cause of Lincoln residents losing so many trees these last two seasons. They are starved to death for lack of sufficient moisture and food material. Many of the houses are badly shadowed and shut in. The thinning out should have been done earlier; now the only remedy is the axe. The elm is the typical American tree, the very best street tree and also ornamental. The white birch makes a good background for evergreens, very hard to transplant in this vicinity; do not try to plant any size above four or six feet of this tree. *Catalpa* is quite ornamental, with its large foliage; use sparingly. Another good tree as a specimen is the coffee tree; one or two are enough for a small place. Hackberry is a good hardy tree, and especially desirable in Nebraska. One of the best shade and ornamental trees is the honey locust; the foliage and habit of growth make it an ideal specimen tree. The American Linden or basswood is good for street effect. It is a pity that the noblest of all American trees, the sugar maple, will not thrive in this climate. The Norway maple makes a fair substitute for ornament and shade. Wier's cutleaved maple, with its semi-weeping habit, is especially suitable for specimen

planting. Schwedler's maple, with its purple foliage, is a valuable addition to the maple family. *Acer geinnala tartarica*, a dwarf variety, is splendid for its fall colors. Special mention should be made of the oaks. Of course, they are slow growing, but they are worth waiting for. The pin oak has a very beautiful habit of growth, and should be planted more freely as a street tree. Red oak is very robust, and the scarlet oak (*Quercus coccinea*) is the very best of them all for its handsome foliage in autumn, the leaves staying on the tree till late spring.

A landscape without evergreens is the most dreary thing on earth in winter. Aside from their beauty, evergreens are the most useful of all trees to the home planter. Where windbreaks are required for shelter evergreens should predominate, because they give protection from the winds in winter. People seem to think that windbreaks are only for professional fruit growers' orchards, whereas almost every home needs something of the kind. Plant evergreens in groups. We can not grow as great a variety in the West as in the eastern states, but what varieties we do grow thrive much better here than there. The Austrian and bull pine grow fast when once established, and have longer lives than the Scotch pine and Norway spruce. Among the evergreens none equals the Colorado blue spruce (*Picea pungens*, var. *glauca*). The color of the foliage is a steel blue; this makes a beautiful specimen somewhat isolated and to the foreground of a group of conifers. It is very high priced, a small specimen three feet high costing five dollars. For an ornamental hedge, screen, or windbreak, the common American arborvitae (*Thuja occidentalis*) is recommended.

For harmonizing the house with its surroundings, vines are as necessary as the trees and shrubs. For the shading and adornment of porches and to soften the bare surfaces and stiff angles, they play no insignificant part. For covering a trellis or porch nothing is so dainty as *Clematis paniculata* with its thousands of white flowers in August and September. A vine that will stand more neglect than any other is the trumpet creeper (*Tecoma radicans*), with its large clarion-like flowers. The scarlet trumpet honeysuckle is another hardy vine. The native climbing bittersweet (*Celastrus scandenis*) is very beautiful with its clusters of orange colored fruit. *Ampelopsis quinquefolia*, the common Virginia creeper, is probably the most hardy and planted more than any other vine. It is unfortunate that the Boston ivy (*Ampelopsis veitchii*), with its various shades of scarlet and gold, is injured by our winters. A worthy substitute is *Ampelopsis quinquefolia*, var. *Englemanni*, clinging to brick and stone walls equally as well as the Boston ivy. Several climbing roses are hardy, as the Prairie Queen, Lady Gay, the new single cherry pink, Dorothy Perkins, and Crimson Rambler. The color of the flowers will not allow the last two named to be planted close to each other.

If we leave out the native roses and the Japanese variety (*Rosa rugosa*) roses are not very desirable plants for landscape work. They should be planted in a secluded, protected part of the grounds. The hybrid perpetual kinds are a disappointment to most persons, oftentimes

getting a few blooms in June and none the rest of the season. If you still wish to grow them, take your choice from this list, the cream of hybrid perpetuals: Ulrich Brunner, Margaret Dickson, General Jacqueminot, Clib, Mrs. John Laing, Magna Charta, Paul Neyron, Frau Karl Druschki, and Mrs. R. C. S. Crawford.

Supposing you wish to have roses every day from June to early frost, and every rose lover does, then by all means plant the hybrid tea roses. The best of these are Gruss au Teplitz, a deep crimson, in blossom all the time; Killarney, a delicate pink shade; Liberty, red; Kaiserin Augusta Victoria, white; Richmond, red; My Maryland, pink; General McArthur, red; and Caroline Testout, pink. With proper watering and fertilizing these should give you plenty of flowers all through the growing season.

OLD-FASHIONED FLOWERS OR HARDY PERENNIALS

In connection with shrubs, perennials without question can be used with good effect in most all landscape work. Their number and variety are almost without limit, and the question is how the garden lover is to enjoy as many varieties as his condition will allow. Hardy perennials may be used in almost any situation where plants are wanted at all. They may grow under the trees, among the shrubs, in borders by themselves, almost anywhere except as plants for formal bedding. Very fine displays can be made by the mixed border system. By mixed border I mean shrubs and perennials together. The shrubs should not be too closely planted. Plant far enough apart to show the individual beauty of the shrub. This style of planting will also allow for some of the bold clumps of perennials. Our shrubs are nearly all very early bloomers, and consequently in summer our shrubberies are practically devoid of bloom.

By the judicious use of perennials and annuals these shrubberies can be made quite showy throughout the summer months. To make a good effect the planter must know his plants. In planting plant in naturally disposed groups, never repeating, if possible, the same plant at regular intervals, as too often seen. The plants should be graduated, arranging the tall ones at the back and the low plants near the edge, occasionally allowing a few taller ones to come near to the edge to break a too formal effect. One of the most important points in the arrangement of perennial plants in the border is the color effect. Too often we see them planted haphazard without any consideration, whether the colors harmonize or not. Herbaceous borders may be avowedly mixed, that is to say, the clumps of each variety may be planted with regard only to their immediate neighbors. When this is done contrasts between colors are more successful than harmonies.

Another method is to take a definite sequence of color, and keep all plants of the same color together. Blue flowers, such as Delphinium, are best to arrange with white. Purple and lilac go well together, scarlet, crimson, pink, orange, and yellow should be arranged to pass harmoniously into one another. Hardy perennials are the easiest plants to grow and the cheapest to buy. When once planted they are easy to take care

of, but do not be misled by the statement seen in the catalogue which would lead one to believe that they can take care of themselves. These plants respond to good treatment the same as other flowers in the matter of good cultivation, watering, and the liberal use of fertilizers. One family, the hardy phlox, will well repay you for the extra care you bestow upon them by larger blooms, longer period in flower, and vigorous plants. It would be impossible to enumerate and describe all the good perennials in this paper. I will name a few of the select ones that are easy to grow.

First on my list is hardy phlox. These plants can be made to yield flowers from May till frost. Plant in the fall, late September, and October. The old plants should be lifted every three years and divided to get the best results. Try some of the native Nebraska phlox (*D. douglasii*); this blooms early in May. Next in order of bloom is *Phlox decussata*, followed by the varieties named: Pantheon, pink; Fraulein von Lossburg, white; Arete, Richard Wallace, Crepuscule, and other good ones too numerous to mention here. Of equal importance to the phlox is the peony. Everybody knows this flower, many people refer to this as "piney" that stood in grandmother's garden. Plant in the fall, and do not disturb for five years or more. The different forms of *Hemerocallis* or day lilies can be used with good effect on account of their foliage. The *Platycodons*, white and blue, will bloom continuously all summer. For spring and early summer the columbines are very showy, the Rocky Mountain varieties and the beautiful longspur hybrids being especially desirable. The German iris should be planted freely. By a judicious selection of varieties, including the Japanese, the flowering season can be prolonged for a considerable time. For the back of your border the *Delphiniums* are stately and effective subjects, ranging in every shade of blue. For a bold effect and acting as a screen to any objectionable feature, the tall plume poppy (*Bocconia cordata*) is often used with good effect. We must not forget the oriental poppy with its large, gorgeous flowers of scarlet and crimson. They are very striking in the border, both for their brilliant color and the immense size of their flowers.

For cut flowers the *Gaillardia* will give abundance of bloom for the home all summer. Another old favorite, and one of the most artistic, is the hollyhock, of many colors, both single and double flowers, the semi-double being the most effective. We must not forget the golden rod and the hardy asters, both natives, which seems to be the reason they are not planted more extensively. But I must not weary you to describe every perennial that is worth growing, for they are numerous and can be had to suit any situation, and as I said before, need very little care, but will well repay you for any extra care that you do give them.

No flower garden can be complete without some of the annuals. These flowers are most essential if one wants a continuous display during the whole summer season.

We could not dispense with such old favorites as sweet peas, pansies, asters, cosmos, and nasturtiums.

Almost all can be grown by sowing the seed where the plants are wanted to grow all summer. A few exceptions to this method of growing

some of the tender and small seeded varieties, as large flowering petunias, scarlet sage, pansies, and cosmos. The seeds of these should be started in boxes in the house, hotbeds, or cold frames, from which they are transplanted to the open ground. Considerable time is gained in this way, often one or two months. Annuals ought to be grown with the perennials and the shrubs, or in a border by themselves, never in formal beds in the middle of the front yard. A partial list is here given of the principal annuals, useful for cut flowers and for decorative effects: Alyssum, white, one of the best for edging borders or formal beds; plant seed outside in fall or early spring. Asters, sow seed inside, the late branching make the best plants and splendid for cut flowers. Dwarf ageratum, blue for edging. Snap dragon, an old-fashioned flower of many colors, sow inside. Celosia, or coxcomb, the plume varieties, are very ornamental. Cosmos, one of the very best, plant early varieties. Annual gaillardias should be grown more extensively for cutting. Pansies, to get quick results before the hot weather arrives, buy plants in bloom from the florist. To be successful raising large flowering petunias, seed must be started inside and transplanted later. Annual poppies must be sown very early in spring, or a better plan, sow in the autumn. The Shirley variety of this flower is very beautiful as a cut flower for decorating the home. Phlox drummondii and verbenas are best planted where a low prostrate habit is desired beside the walk. Sweet peas can be planted in a circle in the border, using brush or wire netting as a support, or planted in a formal row; seed must be planted very early in spring. These directions from the sweet pea annual for 1906 are clear and to the point, twelve words being sufficient: Trench deeply, manure liberally, plant thinly, stake quickly, water freely, dispoed promptly. A few of the bright colored zinnias are worth growing.

Summer flowering bulbs and tubers are desirable both for flower and foliage. Dahlias are flowers I can not recommend for this climate, having had no success for three seasons. The gladiolus is one of the most striking and effective flowers when grouped in small masses with shrubs for a background. If cut as the lower buds begin to open, the spike will last for over a week in the house. To have a succession of bloom make plantings from early April to the middle of June. Cannas make desirable plants where a sub-tropical effect is needed; do not plant in center of your front lawn.

We must not forget the hardy spring flowering bulbs. These Dutch bulbs, as they are sometimes named, do much to enliven the spring landscape. While tulips and hyacinths may be used for geometrical beds, the mixed border is a favorite place for most hardy bulbs. They should be planted in small groups here and there among the hardy plants and shrubs, where one does not hesitate to cut a few flowers, as would be the case in formal beds. October is the month to get these spring bulbs planted. Do not wait till spring comes to get some of these flowers for your grounds. Order early from your seed man the colors you need in August and September so as not to be disappointed by substitutions. At a very small outlay of money you can have a gorgeous display in April and May. Tulips

are easy to grow. All that is necessary is to plant the bulb in the ground. The most striking effects are produced by massing contrasting colors. When ordering these bulbs do not forget the Darwin or May flowering tulips. Though more expensive, these are far superior in length of flower stem, and being late bloomers they escape the late spring frosts. Hyacinths, with their stiff growth, are well adapted for planting for formal effects along a walk or driveway. The yellow and yellowish white daffodils are a welcome addition among the other spring flowers. The single trumpet varieties and the poet's narcissus are the most popular types.

GENERAL REMARKS

Do not buy nursery stock of a street peddler who is a stranger. Patronize the reliable growers of our state who have earned a reputation for honesty and fair dealing. Plants ordered from the nurseries are usually dug and packed in wet moss, or other damp wrapping, to keep the roots moist during transportation. As soon as received the plants should be unpacked, and if they can not be planted at once they should be "heeled in," i. e., placed in a trench and thoroughly watered. Oftentimes these plants are allowed to lie around after delivery in the sun and wind for two or three days, and then if they do not grow the nurseryman is blamed for shipping poor plants. Fall planting is not to be recommended for trees and shrubs. Plant early in the spring; a cloudy day is ideal for planting. Cut back all trees and shrubs when first planted, afterwards leave alone except for an occasional thinning and removing of dead branches. The practice of clipping trees and shrubs merely to make them conform to a required size is to be deprecated. Do not attempt too much. Plan to plant each year only what can be given the best of care.

In *Garden Design*, by Madeline Agar, she says, "Gardens are not made by singing 'Oh, how beautiful,' and sitting in the shade."

With these few suggestions you can have a place of beauty and a joy forever.

BEAUTY IS WEALTH

C. S. Harrison, York

Too many look at things from a mere commercial standpoint and prefer a potato to a rose. If a man was an ox this might do. But he has a soul destined for the eternal beauty, and he should feel it. There is wealth in beauty. A single carnation was sold for \$30,000, and that was the beginning of its value. The grand old Festiva Maxima peony, originated sixty years ago, has been estimated to be worth a million. In several instances I have known \$100 to be refused for a riant silver pungen from the Rockies, the first cost of which was perhaps \$5. Years ago I sent one thousand silver firs from the Rockies to a friend in Massachusetts. The lot cost him, laid down, \$20. I saw in after years three of them which his

sons had sold for \$100 each. There is a tree of this species on the Hunnewell estate near Wellesley, Mass. Money can not buy it.

In the Arnold Arboretum in Boston is a tree lilac thirty years old from seed, which \$200 could not touch. These trees—glorious in foliage and bloom—are now offered at from 10 cents to \$1 each. Money grows if you put it into trees and flowers. One man invested \$50 in peonies and in ten years was selling \$1,000 worth per year. Another invested \$100 in iris and in five years was selling hundreds of dollars' worth per year.

The farmer ought to be rich; by divine right he is king. His kingdom reaches from the center of the earth up to the stars. He is under obligation to the Giver of all Good, to his country, and to the age to make the most of it.

We have visited many of the grounds of the rich in the East, where, on a few acres, they have laid out hundreds of dollars. Their estates seem like sections of paradise. Why can't the farmer fix up, too? His land is richer than theirs. I have known them to pay \$10 per cord for manure in Boston, and then haul it out several miles to their grounds.

The farmers can buy of the western nurseries cheaper than they can sell in the East. Now take a front yard and fix it up. It will cost something, but it is worth something and will be growing in value all the time.

Mark this—you are not to judge a beautiful tree by the amount of wood it contains, nor are you to judge of the value of a Jersey cow by the beef she would make, or either by the 800 pounds of butter she would produce every year. She is an excellent lecturer on condensation. Her influence and her progeny count. Then every good thing has a sentimental value you can not always reduce to dollars and cents.

In Minneapolis a revengeful fellow cut down two beautiful trees in a neighbor's yard. He was arrested and brought into court. Mr. Nutting, a landscape artist, was brought in as a witness. He estimated the trees at \$35 apiece but said he, "Those trees have a sentimental value worth as much more." So the fellow was fined \$70 per tree and had to pay it. Perhaps he found that if revenge is sweet it is also costly.

Suppose you have an acre or two in your front yard. You lay it out in the amphitheatre style. The tallest trees on the outside, then groups of shrubbery towards the front. You have a green lawn with a couple of silver spruce and tree lilacs. You must not obstruct the view. It is better to lay out the grounds so you can take them in from the porch and the neighbors can see them from the road. Your flowers are near the house so your wife, when she is tired can sit there and visit with the purest, sweetest, best dressed company on the earth. Though silent, they are eloquent. Mute songs are they; silent hymns of praise to the Author of beauty. How soothing their companionship. There are the columbines in their spring-time freshness. There a bed of oriental poppies, flaming in splendor—a sea of fire. Then come those full-orbed peonies, filling the air with fragrance, vying with the rose in beauty. Then the phloxes, whose radiance will cheer you down to the hard frosts of autumn.

Why not take that front yard now used for a calf and pig pasture and right on that spot pull down a section of paradise and live in it and have some enjoyment in life? Forty years ago when you were struggling for existence you could not afford it. Now you can. When you are tired, take a vacation on your own ground. Set aside a spot for an arboretum. In it have every kind of tree that will grow in your climate. Go out there and rest in the shade when the sun is hot. Plant all kinds of blooming shrubs and every evergreen that finds yours a congenial climate. Will it pay? Yes, ten times over. Adopt our slogan, Beauty is wealth. Raise a lot of it and be rich.

WHAT DO YOU KNOW ABOUT APPLES?

You have probably observed that some were deliciously fine flavored and others the exact opposite, but do you really know or remember the names of the varieties of either class?

If you can recognize a half dozen kinds you belong to a select minority, for the majority do not know even three.

Apples are apples to most consumers, and when they look over the stock on the fruit stands they are apt to buy the handsomest specimens. These varieties may be Ben Davis or some of his handsomer cousins, and they do not give satisfaction, so the buyer concludes that he has lost his taste for apples. He vaguely remembers that when he was a boy there used to be apples that were really good, and he wonders why they don't grow that kind any more. The truth is that never before did the world have such magnificent high quality in apples as it has now, and a little education on the part of buyers would enable them to select the very ones that would suit them to a dot.

In the first place the apples should be used in their proper seasons only. Some varieties are for summer only, others for fall use; then come the early winter or holiday kinds, and after them the late keepers. Each of these is at its best for a limited period of time until spring.

An early apple might be kept in cold storage without actually spoiling, but its best flavor is gone. On the other hand, the fruit stands everywhere are crowded in the fall with brilliant showy apples that will not mature for months afterward, and are entirely unfit for consumption at the time they are foisted upon the city rubes.

If your grocer or fruiterer has a real knowledge of the fruit he is selling, he will advise you to buy the seasonable varieties. If you want fruit to eat out of hand he can give you apples that are just in their prime that particular month, apples of tender flesh, juicy and sprightly with a brisk acid, a mild sub-acid, or rich and sweet to suit your taste.

If you want the apples for pies or sauce, or baking, there are varieties particularly suited for each of those uses, although some kinds are good in all ways.

Following is a guide for fruit buyers recently published by the Northwestern Fruit Exchange, that is worth keeping for reference.

PRINCIPAL VARIETIES OF APPLES GROWN IN THE PACIFIC
NORTHWEST, SHOWING SEASON OF MATURITY, ETC.

NAME	SEASON OF MATURITY	Rating	USES	Shipments Usually Begin		COLOR
Jefferis	Aug & Sept	9	Dessert	Last	Aug.	Splashed Red
Fameuse	Aug & Sept	9	D. & C	Last	Aug.	Red and striped
Gravenstein	Sept & Oct	9	Culin'y	Last	Aug.	Red streaks over yell'w
Alexander	Sept & Oct	5	Culin'y	Last	Aug.	Red
Wealthy	Sept & Oct	7	Dessert	Last	Aug.	Red striped
Wolf River	Sept & Oct	6	Culin'y	Mid.	Aug.	Bright red
McIntosh	Sept & Oct	6	D. & C.	Mid.	Aug.	Bright, deep red
Yellow Bellflower	Oct & Nov	8	D. & C.	Early	Sept.	Bright yellow
Grimes	Oct & Nov	10	D. & C.	Early	Sept.	Golden yellow
Tompkins King ..	Oct & Nov	9	D. & C.	Early	Sept.	Red and yellow
Jonathan	Oct & Nov	9	Dessert	Early	Sept.	Brilliant red and yell'w
Banana	Nov & Dec	8	Dessert	Mid.	Sept.	Yellow with pink blush
Spitzenburg	Nov & Dec	10	D. & C.	Last	Sept.	Bright red
Ortley	Nov & Dec	9	D. & C.	Last	Sept.	Waxen yellow
King David	Nov & Dec	6	Dessert	Last	Sept.	Deep red
Delicious	Nov & Dec	9	Dessert	Last	Sept.	Dark red and yellow
R. I. Greening ..	Nov & Dec	8	Dessert	Last	Sept.	Green
Wagener	Nov & Dec	8	Dessert	Last	Sept.	Red over yellow
Stayman	Dec & Jan	9	Dessert	Last	Sept.	Dark red stripes.
Baldwin	Dec & Jan	6	D. & C	First	Oct.	Bright red
Northern Spy ...	Dec & Jan	9	D. & C.	First	Oct.	Pink & splashed c'rm'e
Rome Beauty ...	Dec & Jan	8	D. & C.	First	Oct.	Striped with bright red
White Pearmain.	Dec & Jan	9	D. & C.	First	Oct.	Pale yellow green
Arkansas Black..	Jan & Feb	8	Culin'y	First	Oct.	Very dark red
Black Twig	Jan & Feb	8	Culin'y	First	Oct.	Dark red over yellow
Missouri	Jan & Feb	5	Market	First	Oct.	Bright red on yellow
Gano	Jan & Feb	5	Market	First	Oct.	Red
Black Ben	Jan & Feb	5	Market	First	Oct.	Dark red
Ben Davis	Jan & Feb	5	Market	First	Oct.	Yellow with red stripe
York Imperial ..	Feb & Mar	7	Culin'y	First	Oct.	Yellow and light red
Yellow Newtown.	Feb & Mar	10	D. & C.	First	Oct.	Greenish yellow
Winesap	Feb & Mar	8	Dessert	First	Oct.	Dark red
Red Cheek	Feb & Mar	8	D. & C.	First	Oct.	Green with blush
Lawver	Feb & Mar	6	Market	First	Oct.	Bright red

—From Fruit and Produce Distributor, Portland, Ore.

PLANTING AND CARE OF STREET TREES.

Prof. W. J. Morrill, Forester, University of Nebraska.

Throughout the United States there is an awakening interest in the planting of street trees. The larger cities have employed foresters for several years, but now the cities of the size of Colorado Springs are following the example. The villages of New England and other sections of the country are obtaining the desired uniformity in street trees by surrendering the individual rights of the owners of street trees to boards or street tree commissions, which enforce measures aimed to improve

the appearance of the streets. Left to the individual tastes of the property owners, little good can be effected. Formality of tree arrangement along streets is called for, while informality or natural arrangement of trees in clumps or singly is ordinarily best for lawns and parks.

Formality or arrangement of trees along a street is only possible when the owners abide by the rules and regulations of one man or a board or commission.

A bill authorizing the towns and cities to appoint street tree commissions was killed in committee during the recent session of the legislature. The chairman of the committee took the position that the bill enacted into a law would curtail the liberties of the citizens in so far as they could not dictate the species of trees to be grown in front of their houses along the street, and as the spacing of the trees would be left to the judgment of others, while the expense would be borne by the owner, either wholly or in part. But the style of curbing, the absence or presence of parking, and the material in the street surface is not left to the individual tastes of the property owners, although they are obliged to pay for at least a portion of the improvements. It is not consistent, then, to leave street trees out of the general scheme of street uniformity.

The character and quality of street trees are no mean factor in sizing up the community. Few things contribute more to the cultivation of local civic pride than the trees. Our first impressions of a city are gained from the appearance of its stores, public buildings, residences and trees. Perhaps the chief charm of Washington lies in its streets and parks.

Trees add not a little to one's contentment. Some of the pioneers of Nebraska have said, "We missed the trees more than we did our relatives and former acquaintances." And they planted trees, but the practice declined when the second generation came to be influential in affairs. High-priced land may have been largely responsible for the lack of interest in tree planting.

Cities are located where commerce, water power, or transportation facilities dictate. Rarely are the sites chosen because of beautiful environment. The first years of the city's existence are marked by poverty and the struggle for existence. Little attention is then directed toward esthetics. After years bring wealth, culture, and the correction of former crudities.

City trees have a value which can not be gauged by the volume of the trees in board feet or in cords. The appellate court in New York recently confirmed judgment requiring a construction company to pay \$300 to the owner for cutting down a single tree.

The original investment in trees is small, the returns are large. Real estate companies developing suburban properties realize this. The presence of a beautiful tree may add hundreds of dollars to the selling value of the property.

Besides making a city attractive the street trees contribute toward making the city beautiful.

The New York Medical Society more than a century ago resolved that one of the most effective means for mitigating intense heat of the summer months and diminishing the death rate among children is the cultivation of an adequate number of trees in the streets.

THE IDEAL STREET.

When a street is laid out, and prior to tree planting, a soil survey should be made in order to determine the soil's fertility, whether enriching by fertilizers and deep rich dirt is advisable, and to learn of the presence of and depth to hard pan.

It may be necessary to break the impervious sub-soil. Longevity of trees as well as the rapidity of growth depend considerably on soil conditions. Well-rotted stable manure mixed with soil makes a suitable bed in which to set the young tree, if the street soil is not rich. A top dressing of the following chemicals is also very beneficial to trees already set out:

Nitrate of soda, 6 pounds.

Sulphate of potash, 6 pounds.

Acid phosphate, 8 pounds.

Mix thoroughly and apply in small quantities around each tree before a soaking rain.

The trees along a street should be evenly spaced at distances from 35 to 40 feet apart, irrespective of lot width and abutting property. One prevalent mistake in tree planting is spacing them so closely together than only straggling, crowded, unhealthy trees result.

The trees should be placed opposite to each other if practicable, and none should occur within 20 feet of the curb corner at street crossings, in order that danger from collisions by vehicles may be lessened.

On very narrow streets, however, the trees may be spaced alternately, since they will thus have more growing space.

Usually place trees between sidewalk and roadway. This arrangement usually screens the pedestrians from the roadway and adds a feeling of security. Occasionally in narrow streets the space or parking is lacking for this arrangement and the trees must be placed between the sidewalk and the buildings.

Center parking containing one or two rows of trees according to width is attractive where the street's width justifies. Often with a narrow center parking low shrubs, such as wild currant or spirea, is more effective than trees.

Only one species of trees should be used on any street, except where the street is wide enough to permit four rows, in which case the two inner rows may be composed of trees of one species and the two outer rows of trees of a contrasting species.

It is nearly as incongruous to line streets with an assortment of species of trees as it would be to decorate a Greek temple with columns of various orders.

Choice of species will vary with physical and climatic conditions. For exacting conditions the American elm and the hackberry are among the best. The elm is smoke proof and drought-resisting, but is a prey to the leaf beetle, which, however, may be combatted by spraying. The hackberry does not produce heavy limbs so low on the trunk as elm, which is an advantage. Both species are reasonably fast growing for good trees. Cottonwoods, including Carolina poplar, and boxelders grow faster, but possess few advantages other than hardiness and rapidity of growth. In Denver it is unlawful to plant them. Where not proscribed cottonwoods and boxelders may be used for temporary trees and interspersed by the more desirable species which will form the permanent species. The chief danger lies in not removing the transient species at the proper time.

Conifers are not suitable as street trees, although they are favorites as lawn trees.

CARE IN PLANTING

Fall is not a bad time for tree planting, but spring is better. The work in the spring is best done before growth occurs in the young trees, or soon after the frost is out of the ground.

Great care must be taken to protect the roots, especially the fine roots, from drying. A dry root means a dead root. Usually not over a third or a half of the roots of the young tree are removed with it; hence from a half to two-thirds or more of the crown should be removed, in order to maintain a balance between root and branch. The holes in which the trees are placed should be plenty large, and the soil rich or enriched. Place the stem from two to three inches deeper in the hole than it stood in its original position. Tamp the ground firmly around the roots with the hand or foot, in order to get the soil in close contact with the fine roots.

Water the ground thoroughly after the tree is planted, and tie the stem with a burlap strip to a stake firmly driven into the ground. The tree will then have an upright stem. Protect the stem against gnawing by horses by placing around the stem a sheath made of chicken wire. Let the sheath be fastened by light wire which will break readily when the growing stem fills the surrounding sheath.

PRUNING.

As the young tree grows, pruning had best be done while the branches are so small that a penknife can remove them close to the stem. On older trees, where this has not been done, and the limbs requiring removal are large, an undercut with axe or saw is made a few inches from the stem. Next, the saw is made to sever the limb at a point still further from the stem than the undercut. The short stub resulting is then removed by sawing as closely as possible to the stem in a manner to prevent splitting or stripping of the bark. And finally the scar is painted

with coal tar or thick lead paint in order to keep decay infection from entering the wound. With lighter branches less precaution is necessary to avoid wounding.

RECOMMENDATIONS.

Since each citizen can not be expected to devote enough time to qualify as a city forester or as a tree expert, it seems desirable that he delegate his authority over his street trees to a commission, provided every other citizen do the same thing. In this way only can uniformity and effectiveness in street decoration be accomplished. It is a matter of considerable importance from both an esthetic and a business standpoint that our street trees can be given the care that is bestowed on other street fixtures.

EFFECT OF THE DROUTH ON FOREST TREES.

Professor W. Morrill.

LOSS OF WOOD PRODUCTION.

Trees are impelled to observe a period of rest. The winter is usual period for this phenomenon, but conditions may bring about suspended growth, or rest, during the summer. Nothing within the tree induces it to rest; outside conditions alone bring about dormancy. Drouth is a condition that will cause a period of rest in summer, just as cold brings about the period of rest in winter.

Trees have a regularly recurrent dormant stage during winter. So long have they and the progenitors of the present living trees been accustomed, in our latitudes, to the winter rest that many species would still observe the period of dormancy even if transplanted to the congenial warmth and moisture of a hothouse. Yet in time the inherited tendency to observe winter dormancy may be overcome, when the trees are kept in hothouses, where outside conditions are maintained favorable throughout the year, as has been shown experimentally with honey locust, boxelder and black walnut. Environment thus becomes stronger than heredity. Our trees would not suspend active functions of growth at any time of the year if not forced to do so by unfavorable outward conditions.

As winter approaches our trees prepare for it by forming terminal buds and by shedding their leaves. During the drouth this summer the trees made the same preparations, in a measure, and the shedding of many leaves was very evident. Professor W. L. Howard of the University of Missouri relates in his bulletin entitled, "An Experimental Study of the Rest Growth in Plants," that a young elm planted on the horticultural grounds of the Missouri experiment station in 1903 made a good growth up to the beginning of August of that year, at which time a drouth set in and continued with such severity that the tree ceased to grow. By September 1 it had formed terminal buds and auxiliary ones

and finally shed its leaves. It had prepared for a rest period, just as if winter were approaching. Heavy rains, followed by warm weather followed some time later, and these favorable conditions continued well into November. The recently formed terminal buds burst into growth, the resulting terminal shoots grew several inches in length, a second ring of wood was produced that year, and a new set of buds was formed to continue the growth the following spring. It might be inferred from the above account that rings are not safe index of the age of a tree. But usually, if not always, the second ring, or rather the continuation of the ring after arrested development, may be recognized by certain peculiarities, chiefly by the fact that it is not clear cut and often is not continuous, and usually merges into the earlier ring. For these reasons it can be distinguished as a "false ring." Defoliation by leaf-consuming insects and the loss of the leaves because of untimely frost will produce similar "false rings."

In New England in 1816 frost occurred in every month of the year. Such adverse conditions for growth would naturally be reflected in narrow rings, just the same as drouth would record the same result. If in a number of trees of different species and growing in different localities, we should count back from the bark the number of rings and find that the same number of years ago on each tree the ring was exceptionally narrow, the assumption would be that unfavorable climatic conditions prevailed at that time. Drouth would be the most likely cause for the rest period. Scientists have recently been using the above method on the big trees and redwoods of California, which are as old as the Christian era, in order to learn something of the climatic history of past centuries.

The trees of Nebraska, then, during the drouthy year of 1913, have not laid on a normal amount of wood. When the farmers owning wood lots shall come to consider them as areas producing wood crops, the failure of the wood lot to add its cord of wood or so per acre will be appreciated as an economic loss along with decreased corn yield due to the same cause. The loss of wood production in a drouthy year is one of the several evils that accrue, as we shall proceed to consider.

IMPAIRED VITALITY.

An unfavorable winter affects adversely the sheep of the New Mexican sheep grower. The cattle of the sandhills enter the spring with reduced vitality after a hard winter. The lamb crop and the calf crop are reduced, and many weakened animals succumb to the many diseases to which they are subject. We ourselves are subject to diseases chiefly when our vitality has been reduced from any cause. The trees possess vitality to degrees varying largely with their environment. And their environment is affected to no mean extent by climatic conditions, of which moisture is among the most potent. When thrifty, trees will overcome most insect and fungus attacks. Any observant traveler in the Black Hills and the Rocky mountains will find hundreds of western yellow pine trees which have overcome the attack of the Black Hills beetle. Evi-

dences in the form of exudations of pitch from the holes of the beetles lead to the conclusion that vigorous trees are often able to overcome their enemies, and a search in the inner bark reveals the dead beetle or larva "drowned" by the pitch. When the tree's vitality has been reduced from any cause the tree is likely to suffer attacks by fungi or by insects or by both at once, and in its low stages of vitality it may not be able to overcome its enemies.

In most portions of Nebraska drouthy conditions have prevailed during several years; consequently the vitality of most trees has been reduced below normal. Disease from various sources is extraordinarily common and unusually virulent. Many requests for advice are being received by the forestry department and by the department of entomology of the state university. If drouth of an intensity and endurance as great as the one just experienced should occur during each summer for several or many summers, it is not unlikely that disease would practically exterminate our trees. But such a calamity as protracted drouths during a considerable number of consecutive years, while possible, is not probable, as human experience by white settlers in Nebraska for a half century bears witness, and that such a misfortune has not occurred during the past three or four centuries is evidenced by the presence of our native trees. These trees have become adapted to Nebraska climate and therefore to occasional periods of summer drouth. We may look to them to best survive the rigors of such seasons as recently experienced. The trees imported from wetter climates would naturally be the first to feel the strain of drouth here. The green ash, the bur oak, and, in the Pine Ridge, the western yellow pine, and throughout the state the American elm, hackberry and red cedar, among others, should, and I believe do, show less distress than other only partially acclimated species. It seems, however, that an unusually large number of boxelders in Lincoln have succumbed to borers during the summer. In general, it may be safely asserted that severe drouths reduce the vitality of trees, thus rendering them more susceptible to the attacks of decay and of insects.

SUPPRESSED TREES.

Recently, while walking along the bluffs near the Missouri river, the writer noticed many dead trees, killed since they leaved out last spring, for the dried leaves were still clinging to the branches. Upon examination in most instances it appeared that the dead trees were suppressed trees, or those overtopped by neighbors. During normal years the most of these suppressed trees would have survived. Evidently the most of these would die, but the drouth reduced their vitality until the endurance limit was passed, and great numbers promptly succumbed. As a result, then, of the drouth our natural forests and plantations have suffered the loss of many of their suppressed trees. These trees do not possess the vitality of the dormant trees, and when a hard season comes they are the first to die. Insects and decay in this case are not necessarily present or are not the immediate cause of death. The trees simply "burn up" for

lack of soil moisture. This is no great direct loss, however, because they would never have amounted to much, unless freed by cutting the dormant trees overlapping them. Their chief function was the indirect one of protecting the soil from the drying influences of sunlight and air. The presence of this large quantity of killed trees in the forests will tend to increase the insects that live in dead wood, and in states with more extensive timbered tracts would increase the fire danger, which, however, is not great in Nebraska. Soil conditions become suitable for forest trees, because more sunlight and more circulating air will tend to destroy the leaf mold.

DROUTH-RESISTING TREES.

The richer the soil and the more vigorous the tree the greater will be its endurance in drouths; yet certain species are naturally better adapted than others for drouthy condition. They even inherit the qualifications to endure drouth. The writer compared a white pine with a western yellow pine seedling. Both were of the same age and the seeds of both were planted under the same conditions of soil, warmth, and moisture in a hothouse. An abundance of moisture was provided them. The western yellow pine seedling did not expend much energy in stem growth, but it put down comparatively long roots. The white pine sent up a comparatively long stem and a short spreading root system. Each seedling was demonstrating inherited tendencies. The western yellow pine in its natural habitat has to grow deep roots in order to make sure of moisture during drouth intervals; the white pine is indigenous to a region of comparatively heavy and frequent rains and does not need to send down quickly long roots.

The drouth-resisting trees are those which have adapted themselves to arid conditions. Just what physical or morphological characteristics render certain trees drouth-resisting has not been studied deeply, so far as the writer is aware, and a fertile field is open for investigation along these lines.

A study of the leaves of the green ash shows that the leaves of ash growing under drouthy conditons are thicker than those where soil moisture is more abundant. It is possible that an extended study would show leaf, bark, and root peculiarities which render certain trees better adapted to endure drouth. Among the drouth-resisting species may be mentioned western yellow pine, jack pine, American elm, hackberry, Russian olive, sand cherry, honey locust, red cedar, white spruce (usually locally known as the Black Hills spruce). C. S. Harrison is authority for extending the above list with the following: Russian tamarisk, tree lilacs.

In the western part of the state and especially in the Pine Ridge, Colorado blue spruce should succeed in sheltered places.

Norway spruce is not adapted to drouth, and white pine is likely to have small portions of its cambium killed by heat or drouth. Its bark is very thin for a pine, and portions of it simply die, due to the drying of portions of it.

OTHER EFFECTS OF DROUTH.

While an excess of water in compact soils, as are found in portions of the irrigated sections of Nebraska, becomes injurious through impeded aeration of the tree roots, this trouble being made apparent in the pallor of the leaves, a deficiency of water in a season of drouth produces similar premature pallor or yellowing of the leaf. This is apparent mostly in single or individual branches, and records the fact that nearly formed rootlets supplying that branch with soil moisture have been killed by the drying out of the soil. A shortening of the year's growth and the drying out of the portions of the bark, as described in reference to the white pine, are other results of the shortage of soil moisture.

Foresters call a dead topped tree a "stag headed" tree. The most common cause for a stag headed tree is dearth of soil moisture at the roots. The lower branches may obtain sufficient nourishment to maintain a normal appearance, yet with shortened growth, and with continued drouthy soil conditions the creeping paralysis of stag headedness creeps annually downward until the tree completely succumbs.

Drouthy conditions at the root may be independent, however, of drouthy atmospheric conditions. The roots may be in too moist soil and the physiological effect upon the tree may be the same as that of too little moisture; the moisture may not be available to the tree, because of the presence of humic acids from the decay of humus in the water. These acids may induce an "outward" flow from the rootlets rather than the necessary "inward flow," just as alkali in solution in soil water causes an "outward" flow from the rootlets.

PRACTICAL APPLICATIONS.

While we can not alter the climatic conditions and can not prevent drouths, we can to certain extent mitigate their consequences.

1. We can use tree stock that has been grown from seed in this climate, and, if possible, from seed obtained from trees grown here.

2. We can choose species adapted to rigorous climates, especially to those in which drouthy conditons are not uncommon.

3. When planting young trees we can select specimens with well-developed root system, such as is obtained from transplants.

4. If not using home-grown tree stock or trees native to the state, we can use stock grown in as arid or more arid situations, or use trees adapted to even more drouthy conditions than prevail here. This, however, can be overdone, as, for instance, the drouth-enduring western yellow pine will not thrive in the moister parts of Nebraska.

5. Just as through cultivation and the preparation of a finely pulverized soil mulch mitigates drouth in agriculture, the same soil treatment is beneficial with trees. If the trees are in young plantations, cultivation can be carried on in a manner similar to the treatment of the corn crop. With larger trees in a wood lot this, of course, becomes impracticable, but with lawn and street trees a deep spading, following with raking finely the surface, will do much to help the tree through the crisis.

This treatment not only conserves the soil moisture, but helps the roots to get air, and altogether acts as a stimulant.

6. Actual fertilizers may be applied before showers, assuming that even in a drouth light showers may occur. Well-rotted manure and commercial fertilizers may be used, or better still, a mixture of equal weights of the following chemicals may be applied to the ground, preferably just prior to a shower:

Sodium nitrate
Potassium sulphate
Acid phosphate.

7. If your trees are in a plantation at least several years old, it is well to keep the ground in an porous condition best effected by the presence of leaf mold, or humus. This substance acts like a sponge in retaining moisture which otherwise would escape into the air. The humus is maintained in the soil by causing the plantation to grow so densely that sun and air do not consume the humus. Thus by a little forethought and skill the drouthy conditions can be largely controlled.

CONCLUSION.

In brief, the most important effects of drouth are manifested by loss of wood production, relatively of little consequence; by impaired vitality of the trees, thus rendering them subject to many diseases and therefore of great moment, and by the loss of suppressed trees, a matter of less importance. The remedies are not always practicable, but consist chiefly in stimulating the trees by cultivation and by the direct application of fertilizers. It is only a matter of expediency that we should plant trees of species best suited to enduring drouth conditions.

WINTER CARE OF BUSH FRUIT.

G. S. Christy, Johnson.

There is no fruit that comes so near retaining the natural flavor when canned as the raspberry. Consequently there is always a big demand for the berries, both red and black, a demand that is never quite supplied. You ask the commercial grower why, and he complains of winter-killing or berries drying on the bush. As to winter-killing, I believe in this latitude there is never a serious case of winter injury that was not summer-crippled. Anthracnose is the arch enemy of the black caps and crown gall of the reds. Eradicate these two enemies and Nemaha county could supply the state with berries. Some varieties show more resistance to disease than others. I buy every "anthracnose-proof" raspberry I hear of, and sometimes I find I have paid some promoter for being a comical liar. Again I have received my money's worth. Kansas and Gregg are the most susceptible of any varieties I have ever had and Plum Farmer the best.

Plant Plum Farmer and allow a plantation to stand for two years and you will have no trouble with winter-killing or drying on the vines, with thorough cultivation. With the reds, they are more tender and will often succumb to cold weather. But a few of them, especially the Cardinal, can stand 30 degrees all right if the atmosphere is moist, but the dry cold winters are hard on them, especially if afflicted with crown gall. The last three very dry years have nearly eradicated the disease. A heavy mulch or clover crop to hold winter moisture is a big help to the reds. Mulch for winter, but clean cultivation for summer, with pinching back of the canes and thorough spraying will prevent nearly all winter-killing. Old berry fields are disease breeders. Keep the plantation young and thrifty and of the best varieties, and you will have little trouble with dead raspberry fields.

HINTS ON BEST WINDOW PLANTS FOR THE HOME.

J. R. Simanton, Falls City, Neb.

Under the above heading I would name palms, ferns, begonias, primroses, bulbs, cyclamen and geraniums as among the best plants for the home.

Palms and ferns may not be called exactly window plants, but in the estimation of nearly every one they head the list of decorative and ornamental plants for the home. They do not require the strong sunshine as do the blooming plants, but grow a richer darker color back out of the strong light.

In the list of palms I would name the Phoenix roebelenii with its graceful recurved and spreading leaves; the tall growing majestic Kentias; and the well known *Latania barbonica* or Fan Palm.

Of the ferns the grand, drooping Boston and its sports the Whitmanii and Amerpholi are the best and thrive with ordinary care.

Begonias of both the rex and flowering kinds may be had in many beautiful varieties, and they add greatly to any collection of plants. A light soil containing some sand is best for the begonias, and in watering some care should be taken to not wet the foliage, as this sometimes causes the leaves to turn brown on the edge or burn.

The primrose is one of the best winter blooming plants and needs a light, airy place in a moderately cool room.

The Chinese primroses are brighter and have a wider range of color, but are not as free flowering nor as sturdy as the more modest colored *Obconicas*.

In the bulbs probably the best for growing in the window would be the Chinese narcissus, Paper White narcissus, hyacinth and daffodils.

The Chinese narcissus are usually grown in water.

Place the bulbs in a shallow bowl with some small stones or pebbles around the bulbs to keep them in place, nearly cover the bulbs with water and set them away from the light till they have made a good root

growth, when they may be brought to the light and will bloom in a few weeks.

The other bulbs should be potted in soil as soon as you receive them. Plant them so the top of the bulb is just above the soil and set them out of doors and cover the pots with leaves or soil, or set them away in a cool cellar till they make a good root growth. They may then be brought in to the window where they are to flower.

The cyclamen with its beautifully mottled leaves and bright flowers is one of the most handsome of all winter-flowering plants. Like the primrose it likes a light, cool place. Under favorable conditions they will bloom continually from December till April.

The geranium is possibly the most generally grown of any flower, which proves it is a favorite with all.

It is just as good for the window as for the garden and will bloom under any and all conditions.

Water and sunshine will grow them for you and no window collection seems complete without some of these old-time favorites.

FRUIT GROWERS COMING INTO THEIR OWN.

NEW RATES ON APPLE SHIPMENTS IN FORCE OCTOBER 23, 1913.

The fruit growers of Nebraska have been laboring long under unfair competition with growers in other sections. The rates on apples from the producing sections of Nebraska to the consuming sections of the state have been a good deal higher in proportion to the haul than those from apple sections in New York and other producing sections. In other words, the apple grower of New York could place a car of apples in Alliance, Nebraska, and sell his apples for the same or less money than the Nebraska grower, and still make a profit. As this was manifestly unfair the last legislature passed a resolution introduced by Representative Corbin of Johnson county which read as follows:

"Whereas there are many thousands of bushels of apples and peaches, together with much small fruit, annually rotting in the orchards of southeast Nebraska.

"Whereas, transportation rates prohibit its profitable shipment to abundant markets in the central and western parts of the state, therefore,

Be it Resolved, that the Honorable Board of Railway Commissioners are hereby asked and directed to make a full investigation of the matter, and establish, not later than August 1, 1913, such rates for the transportation of such fruit as will be just and equitable between all parties concerned.

Under the existing laws the Railway Commission was powerless to make such an order without some one filed a complaint with them and put the proposition up so they could give a decision upon it.

Accordingly Mr. Corbin of Johnson county on July 14, 1913, filed a complaint on behalf of himself and other fruit growers of southeast Ne-

braska. In brief, his complaint covered the following points: That annually hundreds of bushels of apples spoil in orchards of the growers. That a considerable portion of the state does not grow enough fruit for its own needs; that the freight rates from the points of production to the points of consumption in the state, over various lines of railroads, are unreasonable and excessive; that joint through rates for such shipments are not generally maintained by the carriers with storage in transit privileges, and petitioned the commission to determine and fix a reasonable schedule of rates for apples and fresh fruits for single line and joint haul, and likewise reasonable rules and regulations for storage in transit privileges and "stopping in transit" to finish loading or partly unload.

Notice was served on all the defendant railroad companies, and on August 25 to 26 a hearing was given.

Representative Corbin of Johnson county as complainant was assisted in producing evidence in support of the complaint by Mr. E. M. Pollard, president, C. G. Marshall, manager, G. S. Christy, a director, of the Eastern Nebraska Fruit Growers' Association. After taking all the evidence in the case, which clearly showed that apples that would be suitable for domestic use, and could be profitably used by consumers in central and western Nebraska, were spoiling in the orchards because the cost of transportation was so great that they could not be handled at even a small profit.

Accordingly, on September 23, 1913, the State Railway Commission issued an order, adjusting the rates, giving loading and unloading in transit privilege, and storage in transit privilege, a copy of which follows:

ORDER.

It is therefore ordered that the Chicago, Burlington & Quincy; North-western; Chicago, Rock Island & Pacific; Union Pacific; Chicago, Milwaukee & St. Paul; Missouri Pacific; St. J. & G. I. railroads be and the same are hereby notified and directed that on and after October 23, 1913, you are hereby notified to transport shipments of apples, pears, and peaches in straight and mixed carloads between stations within the state of Nebraska, and to charge and collect rates to be prescribed as a maximum, and subject to the rules and regulations hereinafter prescribed:

The rates to be applied on straight or mixed carload shipments of apples and pears packed in barrels, boxes, or crates shall not exceed 110 per cent of rate shown in "Schedule A," the 80 per cent clause hereinafter set forth to apply on shipments over more than one railroad.

The rate to be applied on carload shipments of peaches packed in baskets with solid or slatted tops, boxes, or crates shall not exceed 130 per cent of rate shown in "Schedule A," the said 80 per cent clause to apply on shipments of apples in bulk or in packages. The carload rate for peaches herein provided shall apply to the entire carload.

When apples or pears in packages are shipped with packages of bulk apples the 110 per cent rate shall apply on the entire carload.

The charges on carload shipments of apples, pears, or peaches, straight or mixed carloads, passing over two or more lines of railroads within the state shall be 80 per cent of the sum of the local charges as herein provided by the short line track connection, junction point for distance each railroad hauls the car.

EXAMPLE.

Bulk apples, C. L., Railway A, 45 miles.....	7. cents
Bulk apples, C. L., Railway B, 100 miles.....	9.75 cents
Total, 145 miles	16.75 cents

Eighty per cent of 16.75 cents, the sum of the locals, would be 13.4 cents.

When the application of the 80 per cent rule would make the rate less than the continuous mileage rate it is herein provided that the continuous mileage rate would be the joint rate.

EXAMPLE.

Bulk apples, C. L., 10 miles, rate.....	5.25 cents
Bulk apples, C. L., 400 miles, rate.....	22.75 cents
Total, 410 miles.....	28.00 cents

Eighty per cent of 28 cents, the sum of the locals, is 22.40, while the continuous mileage rate for 410 miles, as herein provided, is 22.75 cents, which would be the joint through rate.

The transfer charges on all carload shipments shall be absorbed by carriers interested in the haul, except at junction points where there is no direct track connection and it is necessary to deliver cars through intermediate carrier. In such cases the actual cost of intermediate switching service may be added to the through charge.

The minimum weight in straight or mixed carload shipment of apples, pears, or peaches shall be 24,000 lbs.

Apples, pears, or peaches moving under the rates herein provided may be stopped once in transit to finish loading, and once in transit to partly unload, at a charge of \$5.00 per car for each stop. The stations where car stops to finish loading or to partly unload must be directly intermediate between the original point of origin and the final destination of the shipment.

Shipments of apples, pears, and peaches in straight or mixed carloads may be stored in transit for a period not to exceed six months without extra charge at points in the state of Nebraska, directly intermediate between original point of origin and final destination of shipment. Where the shipment moves under joint rates the initial carrier may charge its full rate as herein provided, up to the storage point, the joint rate charges to be adjusted between the carriers when the car is moved to final destination. Reference to inbound billing must be submitted to outbound carrier at storage point at the time shipment is forwarded.

When necessary to send caretaker in charge of heaters or stoves in

carload shipment of apples, etc., to prevent freezing, one man will be carried free with one or more carloads from one consignor to one consignee during November, December, January, February, March, and April. Agent at point of origin will execute contract form to fit conditions as provided above. Return transportation may be issued to one caretaker actually accompanying two or more carloads of apples, peaches or pears during the months of November, December, January, February, March, and April.

Such return transportation to be issued within ten days after arrival of shipment at final destination.

Heaters or stoves and necessary lining to protect car from damage by fire shall be returned to original point of origin without charge. The return waybill must give reference to outbound carload shipment.

Made and entered at Lincoln, Nebraska, this 23d day of September, 1913.

Nebraska Railway Commission,

HENRY T. CLARKE, JR., Chairman.

Attest: A. B. ALLEN, Secretary.

SCHEDULE "A"

Carload rate, bulk apples, single line haul, minimum weight 24,000 pounds.

Miles	Cents per 100 lbs.
0 to 5.....	5.00
5 to 10.....	5.25
11 to 15.....	5.50
16 to 20.....	5.75
21 to 25.....	6.00
26 to 30.....	6.25
31 to 35.....	6.50
36 to 40.....	6.75
41 to 45.....	7.00
46 to 50.....	7.25
51 to 55.....	7.50
56 to 60.....	7.75
61 to 65.....	8.00
66 to 70.....	8.25
71 to 75.....	8.50
76 to 80.....	8.75
81 to 85.....	9.00
86 to 90.....	9.25
91 to 95.....	9.50
96 to 100.....	9.75
101 to 106.....	10.00
106 to 110.....	10.25
111 to 115.....	10.50
116 to 120.....	10.75

Miles	Cents per 100 lbs.
121 to 125.....	11.00
126 to 130.....	11.25
131 to 135.....	11.50
136 to 140.....	11.75
141 to 145.....	12.00
146 to 150.....	12.25
151 to 155.....	12.50
156 to 160.....	12.75
161 to 165.....	13.00
166 to 170.....	13.25
171 to 175.....	13.50
176 to 180.....	13.75
181 to 185.....	14.00
186 to 190.....	14.25
191 to 195.....	14.50
196 to 200.....	14.75
201 to 210.....	15.15
211 to 220.....	15.55
221 to 230.....	15.95
231 to 240.....	16.35
241 to 250.....	16.75
251 to 260.....	17.15
261 to 270.....	17.55
271 to 280.....	17.95
281 to 290.....	18.35
291 to 300.....	18.75
301 to 310.....	19.15
311 to 320.....	19.55
321 to 330.....	19.95
331 to 340.....	20.35
341 to 350.....	20.75
351 to 360.....	21.15
361 to 370.....	21.55
371 to 380.....	21.95
381 to 390.....	22.35
391 to 400.....	22.75
401 to 410.....	23.15
411 to 420.....	23.55
421 to 430.....	23.95
431 to 440.....	24.35
441 to 450.....	24.75
451 to 460.....	25.15
461 to 470.....	25.55
471 to 480.....	25.95
481 to 490.....	26.35
491 to 500.....	26.75

Miles	Cents per 100 lbs.
501 to 510.....	27.15
511 to 520.....	27.55
521 to 530.....	27.95
531 to 540.....	28.35
541 to 550.....	28.75
551 to 560.....	29.15
561 to 570.....	29.55
571 to 580.....	29.95
581 to 590.....	30.35
591 to 600.....	30.75

When rates are not provided for the exact distance the rates for the next greater distance shown may be used.

LESSONS FROM DISASTER.

C. S. Harrison, York, Nebr.

The summer of last year was bad enough, but the summer of 1913 will long be remembered. It was pitiless, merciless. Day followed day in a fierce attack on all vegetation. The corn went down before those terrible blasts, the wonder is that anything lived.

We always plant a good many cuttings. *Soniceras*, *spireas*, and *syngas* generally do well, but this year no sooner did they peep out of the ground than the fierce sun was ready to scorch them. Almost all died, save one; that was the silver tamarisk also called the *Krissleen*, the *Odesianua*, and the *Amurensis*, all one and the same. Here in York we have tried the ten sorts, all indeed that we could hear of. We gave them a fair trial, but none but the silver was satisfactory. Some would sunburn and some could not resist the cold. The Chinese, the Japanese (*Algonus perome*) the African, the German, and French went under. The silver tamarisk grows from cuttings, and unfavorable as it was, almost every one lived, and some grew over two feet. They are exquisitely wonderful. I think they take the lead of all the ornamental shrubs. There is the soft delicate silvery foliage, fresh in the fiercest of the heat. It is wonderfully well adapted to the semi-arid region. In fact, it does better there than in the moister East. Even in Nebraska I have known it to mildew in a wet season. It is at its best in the hottest and driest of seasons. Added to the charming foliage there are also delicate pink blossoms that line the twigs, making it very attractive. I have seen them trimmed in many forms, a beautiful globe and a cone shape. They will stand any amount of cutting. The cemetery at Pueblo, Col., had a hard time finding a suitable hedge. I advised this, and they secured a thousand small plants and soon had a charming hedge. The drouth and heat of that section are terrible, but they rather enjoyed it. If you want to make sure of a windbreak for a garden out in the semi-arid regions, get this shrub by all means. Don't make your enclosure too large; perhaps an eighth of

an acre would do. This you might be able to cultivate thoroughly and see that it is well fertilized. That heroic hedge would wear a defiant smile and cheerful look as much as to say, "Don't worry, I am taking care of things." Sheltered by such a compact enclosure you can raise a few choice things which outside would be swept by these Hadean blasts.

The best tree to resist drouth and heat is the Russian olive, sometimes called the candle tree, because the green wood burns more readily than any other. This also has a silver foliage which makes it conspicuous. While living at Franklin in this state it outgrew all the natives until it began to bear, when it bore so heavily that the others caught up with it.

The next best heat-resisting tree is the honey locust. This grows wild in the salt lands near Lincoln and in the alkali and adobe soils of Pueblo it thrived without irrigation, though I advised a system of automatic irrigation which helped out. I had a depression about the tree that would hold a couple of barrels of water. Rain often came in dashes. The ground declined slightly; with a hoe I made furrows which converged towards the tree. Then came the dash of rain, and the little furrows would pour a lot of water in the depression which would soak in and nourish the tree till another shower came. The soil was so strong alkali that the earth thrown out of a hole 18 inches deep looked, after a shower, like a mound of snow. Another shrub is the Korean lilac. This seems to pay the least attention to the heat. We keep about 50 kinds of lilac bushes. Some will wilt and some will be burned. Last fall we dug a large quantity and stripped off the side sprouts to plant. Some of these would be three feet tall. Of course they had very little root. The surprising thing was that almost every one grew and leaved out to the very top, and they endured the fierce heat without flinching. There are three kinds of these Koreans, the red, the deep red, and the white. They bloom in the greatest profusion and are completely mantled in robes of splendor. The Chinese tree lilac comes next in its power of resistance. At Franklin in this state after three years of drouth they blossomed in great profusion, and I had a fine bouquet photographed. These trees get to be 50 feet tall and a foot through. I introduced them to the west. We have some seven inches through and 20 feet tall now.

The most wonderful plant to resist the heat is the glorious iris. This is the flower which will soon be at the front. Named for the goddess Iris, the rainbow personified, it combines all the glory of sky and earth. We have over 150 sorts, and nowhere on earth have I seen so much beauty packed on a piece of somber earth as in our iris garden. You have all the colors of the rainbow, that marvelous tracery and blending of the most exquisite tints and shadings that defy description. They give a succession of bloom for two months. The housewife, instead of sending to the florist, can go out in the garden and cut a bouquet fresh with the dew for her table. They do not cringe before the heat and drouth. The phloxes cry and plead for water, even the hardy peonies pine, leaves will be burned on the choice shrubs, but the iris will keep on growing and mul-

tipling. We commence digging and shipping in August and keep it up till the ground freezes. You go to dig and you will find the ground as dry as an ash heap just thrown out of the furnace, but the roots gather and hold the moisture and they are plump and fleshy and vigorous, and when transplanted commence growing with great vigor. It is a fortunate thing that the most charming of all the family flowers is so well suited to these regions, the climate of which is so trying to other things. The spring rains will bring on the blooms and then the plants will take care of themselves.

These flowers are well adapted to California where it rains one month which will bring out the blooms, and then the plants will hold their own and keep on growing during the dry months.

The Oriental poppies, the Chinese bellflowers and the columbines all of them passed through the ordeal without trouble.

CURATIVE PROPERTIES OF FRUIT.

By J. H. Kellogg, Battle Creek, Michigan, Sanitarium.

Man, like the big apes, the gorilla, the chimpanzee and the orangoutang, is naturally a fruit eater. Cuiver, the great French naturalist, called attention to this fact more than a century ago. The same fact was announced in Holy Writ. Genesis, chapters 1-29, reads: "And God said, 'Behold, I have given you every herb-bearing seed which is upon the face of all the earth, and every tree yielding seed; to you it shall be for meat.'" Fruits, including nuts, grains, and tender shoots, are unquestionably the natural bill of fare for the human family. The big apes at the London Zoo receive no other food with the exception of cooked vegetables. Fruits differ from most other foods in the fact that they require no cooking. They are, as they say in Mexico, cooked in the sun. It may even be said that they require no digestion. This last statement, if not absolutely true, is nearly so, for the sugars and acids of fruits require no digestion, but are ready for immediate absorption and supply the body with nutriment in its most easily available form. This is why fruits and fruit juices are so wonderfully and immediately refreshing. The energy-imparting elements which they contain are ready for immediate absorption, and hence do not tax the body or digestion.

The common prejudice against the use of acid fruits, on the ground that they render the blood acid, and hence should be avoided in gout and rheumatism, is entirely without foundation. The acids of fruits are combined with alkaline substances. When fruits are eaten the acids are quickly digested, burned, or utilized in the body, leaving the alkalis behind, so that the effect of fruits, even those that are decidedly acid in flavor, is to increase the alkalinity of the blood and to aid the body in getting rid of uric acid and other poisonous acid wastes. The free use of apples and of juicy fruits of all sorts is to be highly recommended in all cases

of chronic rheumatism, gout, and in fact in all forms of chronic diseases. Fruits stimulate and aid the action of the kidneys in the elimination of poisons, hence are exceedingly valuable in Bright's disease.

Another of the great advantages to be derived from the use of fruits is their influence upon the bowels. Constipation is the universal disease of civilization. Almost everybody suffers from this malady. Even those whose bowels move daily may be suffering from latent constipation. The bowels should normally move three times a day. Fruits stimulate intestinal activity not only by furnishing the bulk which the bowels require to stimulate action but also through the stimulating effect of the acids and sugars which they contain, which act especially upon the small intestine. All sorts of fruits are helpful in this regard. At the Battle Creek sanitarium we make very large use of fruits. The following list shows approximately amount of various fruits used by our family of guests and workers each year:

	Fresh Cases	Canned Quarts
Strawberries	1,200	6,000
Raspberries	500	5,000
Peaches	750	7,200
Pears	350	15,000
Plums	225	3,500
Blueberries	275	2,380
Blackberries	100	500
Cherries	450	10,000
Pineapple	50	8,000
Oranges	1,500
Grapefruit	1,000
Lemons	600
Bananas, bunches.....	850
Apples, barrels	1,750
Apple juice, gallons	3,500
Grapes, pounds	20,000
Grape juice, gallons.....	2,500

BATTLE CREEK SANITARIUM

Store Department.

Battle Creek, Mich., Jan. 28, 1913.

Editor Better Fruit:

Your letter of January 23 received. I am glad that you have received the article and will say that apples are used very freely every day upon our tables. We do not use many canned apples or very many evaporated. Use no vinegar, but make fresh cider, as long as apples will permit. At this time of year I make up between three and four hundred gallons of apple juice every two or three weeks, keep it in cold storage, so that it does not ferment. In addition to this I put up about 10,000 gallons in five-gallon retainers and sealed, as you would canned fruit, for our summer use when we are not able to procure fresh apples. Will say this

apple juice that we use through the summer is not boiled, but we heat it to a temperature a good many degrees this side of boiling point, but sufficient to destroy the fermentation germ, and we are able to keep it two or three years. We find it very valuable for our patrons and it is used three times a day on the tables. Very truly yours,

Sanitarium Store Department,
Per O. C. Edwards.

SOME BULBS WHICH SHOULD BE PLANTED NOW.

Chapin Brothers, Lincoln.

Bulbs of one kind or another should be grown by all lovers of early spring flowers. Here are plants for every place and purpose—beautiful for the formal beds and borders and especially attractive for the wild spots of our lawns.

For several reasons bulbs are the most popular of any spring flowers. They have so much latent beauty stored in them, and require so little skill from the amateur gardener. Then, too, coming as they do so soon after a long winter, they seem especially symbols of spring.

Snowdrops, crocus and scillias even bloom while the late snow is on the ground. Not having to forage for food in the spring (the flower having formed the previous year and being within the bulb) they are ready to flower at the first signs of spring.

The above-mentioned bulbs may be planted in beds or in borders, or among the grass in the open lawn. The soil of Nebraska is especially suitable for bulbs as they do best in a soil which is rather light and loamy. Too sandy soil may be helped by having well rotted manure well spaded in, but this fertilizer must be spaded in sufficiently to prevent it from coming in contact with the bulbs.

Early tulips such as Yellow Prince, Cottage Maid, La Reine, Duchess de Parma, Tom Moore, Artus, and many others should be planted in solid beds only, in order to get the best results.

We, however, recommend especially the late tulips for out-of-doors planting. These varieties are as gorgeous as the early ones, perhaps even more so. In addition to this, they have the advantage of blooming about the last of May, when all danger of frost is over. The stems of the later varieties are usually longer, varying from about 18 to 24 inches. Then, too, the flowers last longer, and the bulbs as a whole have more vitality and do not require replanting as soon. Indeed, we have had some bulbs in the ground for six or seven years, and each year fine flowers are produced. The later tulips are more showy in a border than in a formal bed, and should be planted in that way if the best results are to be obtained.

Among the best of the standard varieties are: *Gesneriana major* (scarlet), *Gesneriana lutea* (yellow), Golden Crown (golden yellow striped with red), Picotee (pink), Ida (white), Gala Beauty (vermilion striped with yellow), also Parrots and Darwins.

Among spring flowering bulbous plants, the narcissus family, which includes daffodils and jonquils, is one of the most important and of world-wide popularity. They may be grown in garden beds, among hardy plants in herbaceous borders or "naturalized"—that is grown as if wild in outlying portions of the lawn or grounds. They thrive in ordinary garden soil, but grow and flower most luxuriantly in deep, moist loam. The depth to plant varies according to the size of the bulb, from three to five inches is about the average and from four to six inches apart.

The narcissus are of longer life than most bulbs. There is a field in New Jersey where the daffodils which once surrounded an old garden have been multiplying and blooming without care for over a hundred years. There are many varieties some fifty or sixty of which are exceptionally good. Among these are: Emperor, Golden Spur, Henry Irving, Empress, Princeps, Victoria, Princess Ida, Sir Watkins, Stella, Ornatus, Poeticus, Triumph, Van Sion, Campbell, Jonquil and J. M. Camm.

Hyacinths are popular, both because of their fragrance and beautiful colors, the lavenders, blues, and purples, which are so scarce in other flowering plants. These should be planted in a deep, well-spaded and loamy soil, about four inches deep and six inches apart. The best effect with these is obtained by planting them in formal beds.

This list, although very incomplete, serves to remind you that all spring bulbs should be planted before November 15th. If you should only plant a part of these you will be well repaid in the spring of 1914 and for many years to come.

NEW VARIETIES OF GRAPES.

Charles B. Camp.

Cheney, Nebr., Sept. 24, 1913.

Mr. J. R. Dunéan, Secretary Nebraska State Horticultural Society:

Dear Sir—In response to your letter of September 17, asking for a description and the breeding of the two new seedling grapes, Adah and Ernest, recognized and recommended by the Nebraska State Horticultural Society, September 2, 1913, permit me to say I have been engaged in breeding grapes since 1896, a period of seventeen years.

I now have permanently set and growing in my vineyard forty varieties of my own growing from crossed seeds. These forty varieties have been fruiting from two to thirteen years. Twelve of them have been recognized and recommended by the Nebraska State Horticultural Society. Only a few of the remaining twenty-eight have been exhibited. I prefer to test them on my own grounds for several years before asking recognition by the society. Only those that prove a valuable addition to our already long list of grapes will be offered for recognition. The grape named Adah was grown under the John Burr system of propagation of new varieties. A full account of the method is given in my article on Breeding Grapes, Horticultural Report 1906, page 124.

The Adah grape is a seedling of the Brighton, undoubtedly crossed with some *Labrusca* variety, as the tendrils on the Adah are neither regularly intermittent nor continuous. Some canes have them intermittent while on other canes of the same vine there are sometimes three, four, six or even eight tendrils continuous. Seed was planted in the autumn of 1898; permanently set in the vineyard in the spring of 1900; first fruited 1904; has fruited annually since, except in 1910. Adah starts growth very early in spring, and is apt to suffer loss of crop in localities where late spring frosts occur. I am located in the highest point between Lincoln and Nebraska City; am immune from either late spring or early fall frost.

Adah grape is a strong, free grower, points rather short; leaf medium size; cluster medium to large in size, compact, not so much as Telegraph; berries large as Concord, bright red, covered with pale bloom, giving fruit a light red appearance. The fruit is very sweet and of aromatic flavor. A most splendid grape for the table; vine a very heavy bearer; productive almost to a fault.

The Ernest grape is a production of a Brighton seedling in the second generation; the maternal parent of the Ernest grape was grown under the John Burr system, same as the Adah grape, in the autumn of 1898. Was entered on my grape record as B-27. The letter indicated the grape row and the number of its location in the row. B-27 is still thrifty and bears abundantly; clusters rather small, very compact; berries large as Concord; bright red; very sweet and decidedly aromatic flavor. From a study of the plant B-27 I was convinced it partook of almost equal properties of both its maternal and paternal ancestry whatever its parternal parentage may have been. According to Professor Mendall's law of hybrids the second generation of B-27 should give a valuable variety. In the autumn of 1906 seeds of B-27 were planted. The following season the seedling vines were culled down to six; one of the six is the Ernest grape.

The Ernest grape is a strong and healthy grower, equal to Concord; joints medium length, intermittent tendrils, leaves medium, slightly three-lobed, pale green above, greyish felt below. Leaf stalks large and strong; ripens its wood early in the fall. Clusters large to very large. One on exhibition September, 1913, weighing 18 ounces.

Clusters are sufficiently compact to make handsome clusters. Berry a little larger than Concord; greyish scarlet in color, very sweet and of fine flavor. Ripens between Moore's Early and Worden; ripens evenly; does not crack or shell and retains its fine flavor when left attached to the vine. Ernest grape is as productive as the Concord and seems perfectly hardy.

Of the twelve varieties I have exhibited before the Nebraska State Horticultural Society three have been grown under the John Burr system; the other nine varieties have been grown by direct application of the pollen. The John Burr system of propagation has but one redeeming feature and that is congeniality between varieties. Experience has

proven to me that congeniality between paternal and maternal parents is an absolute essential element in growing fruits that are an improvement over either parent plant. Many plant breeders overlook the principle of likes and dislikes among plants. And herein lies the secret of successful breeding of plants. Some one possibly will wonder how I can determine by the young seedling plants which ones have been hybridized under congenial conditions.

I will illustrate by using a very familiar case. Suppose we desire to cross the native grape of Nebraska (*Riparia*) with Concord (*Labrusca*). The *Riparia* has regularly intermittent tendrils. The *Labrusca* regularly continuous tendrils. We cross the plants in blooming season and save the seeds from our cross clusters in the fall. Plant the seeds either in the fall or spring, fall preferred. When the young seedling grapes have grown twelve to fourteen inches the tendrils will appear in their regular order. Now we will begin to cull our plants, pulling up and casting away the unprofitable ones.

The first vine has regularly intermittent tendrils. It is too near like the maternal parent. Cast it away. The next plant has regularly continuous tendrils; it is too near paternal parent; cast it away also. The third plant has some canes regularly intermittent, some canes contain three or four or five or six tendrils continuous. Now here is a plant containing nearly equal portions of both parents: save this. This is just what the *Elvira* grape shows, and is its breeding. Always save the plants that strongly reflect both parents.

SOME EFFECTS OF THE DROUTH UPON VEGETATION.*

By Raymond J. Pool.

The summer of 1913 was exceedingly dry and hot in many parts of the United States, but the combination of climatic and edaphic factors which produces that complex effect included under the term drouth appeared to center in southeastern Nebraska, eastern Kansas, northwestern Missouri and southeastern Iowa. Lines of extremely xerophilous conditions radiated from this general axis for several hundred miles in nearly all directions.

During this period there were a number of days when Lincoln, Nebraska, experienced the highest temperature recorded by the eighty or more stations of the U. S. weather bureau which report to the Lincoln office. The dry period began at Lincoln on June 8 and continued until about September 8. According to the director of the Lincoln section of the weather bureau only 2.84 inches of precipitation was recorded for this period. This represents but twenty-five per cent of the normal rainfall for this time at this station. Almost one-half of this amount fell

*This paper appeared in practically its present form in a recent number of "Science."

in such small quantities as to be of little benefit to vegetation. Weather records have been kept at Lincoln for thirty-two years, and this is the lightest rainfall ever recorded for ninety-two days at this time of year. The normal precipitation for this period is 11.33 inches.

The temperature was high for the last part of June and the first half of July, but the first of the higher temperatures were recorded between July 13 and 17. These five days were very hot, the maximum temperature ranging from 102 degrees F. to 109 degrees F. More moderate temperature followed these first blistering days for about one week, and then the remarkable hot period began. High temperatures prevailed with hardly a break from July 26 to September 7 or 8. During these forty-four days there were twenty-three days when the maximum temperature was 100 degrees F. or more, and it was below 90 degrees F. on only seven days. On an additional number of these days the temperature went to 97 degrees to 99 degrees F. During the whole period from June 8 to September 8 there were twenty-nine days with a temperature of 100 degrees F. or higher.

The relative humidity was low at various times during this long continued "hot wave," and the conditions favoring desiccation were accordingly greatly magnified. Add to all these rigorous climatic conditions the influence of a strong wind which prevailed at times during the heated season, and this region was at the mercy of the most extremely dry and protracted summer weather on record.

The most important effect of the drouth is reflected in the greatly reduced yield of a number of the leading field, forage, and garden crops, the products for which the territory is renowned. Fortunately the yield of winter wheat was not seriously impaired because that grain was so far advanced toward maturity at the beginning of drouthy conditions that there was plenty of moisture in the soil (from a very promising spring) to satisfy the needs of that particular crop. In fact, it appears that the yield of winter wheat for the year 1913 was considerably in excess of the average for practically all of the drouth-stricken territory west of the Mississippi.

The second and third cuttings of alfalfa were, however, much less than normal for the region as a whole. Some farmers secured a very low return from the third crop of this legume. The yield of potatoes and other less important garden vegetables was also greatly affected by the hot dry days of the latter part of the vegetative season, although in certain parts of the region potatoes are yielding heavily.

Corn was the crop which suffered most, and since the prosperity of the country is so often figured with reference to the yield of this crop, the effects of the drouth appear unusually severe. Except in a few portions of this state (Nebraska) the yield of "King Corn" was very greatly diminished, and in some parts, where at least some corn usually grows, absolutely no corn will be harvested.

One of the most noticeable effects of the drouth upon the native plant life was seen in the shortening of the period of vegetative growth and

in the hastening of flowering and fruitification. This was noted especially with various herbaceous plants which apparently completed their summer activities several days or weeks earlier than usual. Early leaf maturity and leaf fall was common among native and exotic forest trees. In some cases almost all of the leaves had fallen by the end of July, while in nearly all of our trees noticeable early leaf fall was characteristic. Thus especially conspicuous in this regard in Lincoln were the hackberry, *Celtis occidentalis*; elm, *Ulmus americana*; and Carolina poplar, *Populus*. These trees also showed great variations in the condition of their leaves, some individuals being nearly leafless at the same time (August) that others were quite normal. Many gradations occurred between these two extremes. The ash, *Fraxinus lanceolata*, was apparently affected to the least degree of all of our commoner three species. Street trees in general suffered greatly, and many such individuals perished during the summer. One man, the owner of very attractive home and grounds in another city of the state, told me that he had kept three lines of hose constantly pouring water into the ground about his trees throughout the summer, and that even then some of the trees were affected by the dry weather.

Toward the close of the summer it was noted that a number of the trees that had lost practically all of their earlier leaves had developed many new bright green leaves which, however, were much smaller than the typical leaves of the species. The most conspicuous examples of this phenomena occurred in the hackberry and in the Kentucky coffee tree, *Gymnocladus dioica*. Some trees of the former species put forth practically a full number of new leaves, but the small size of the late leaves made such trees rather noticeable. Many clusters of short compound leaves with very small leaflets appeared upon the almost bare club-like branches of the coffee tree. In this case the new leaves came from dominant buds situated at some distance below the shoot apices.

Native woods along the streams of the eastern part of Nebraska were unusually dry and barren. The usual mesophytic undergrowth was greatly reduced in volume, and few species of the usual summer and early autumn fungi were to be seen. The rich soil of the more open parts of such woods became as dry and powdery as that of the fields, and some of the moisture-demanding plants of such habitats dried up and disappeared long before the usual time. Many of the spring-fed streams of the woodlands disappeared completely and the ravines became desiccated to a very unusual degree.

Native pastures suffered greatly, and after July 15 little or nothing of forage value was to be found in such places. The ground became very dry, and in some places broke into great blocks of extremely hard soil with prominent fissures between the solid masses of soil.

The dryness of native vegetation and fields along the railroads resulted in the starting of an unusual number of fires by sparks from passing locomotives. Such blazes destroyed considerable grain in the shock or stack, and in at least one case resulted in the death of a farmer

and several of his horses. During a trip across the state early in September it was noted that many fires had been kindled in this manner, so that the railroad right-of-way, and sometimes for considerable distances on either side, the grass or stubble had been destroyed by fire for long distances. Groves of planted tress or rows of trees along the railroad were frequently damaged or completely killed. This indirect effect of the drouth seemed to be unusually common in many parts of the drouth-stricken territory.

As cooler and moister weather succeeded the trying drouth, numerous cases of renewed activity on the part of the vegetation were evidenced. The most pronounced late season reaction of this sort was observed in the re-greening of lawns, pastures, and roadsides which had appeared as areas of stubble for so many weeks. The fresh green of early October is most welcome evidence of the fact that vegetation was not entirely burned out under the protracted dessication of the long summer weeks.

Examples of the autumnal flowering of trees have been noted in greater than usual number. That this phenomenon is not induced in all cases by the succession of moist weather after a period of drouth (as is commonly supposed) is shown in the case of a cherry tree on the campus of the University of Nebraska. This cherry tree, *Prunus padus*, came out with its second production of flowers early in September before the drouth had been "broken." A striking additional peculiarity of the serotinal flowers of this species was seen in the presence of many abnormalities and malformations. Phyllody of various flower parts was especially common. Many of the racemes were in fact transformed into veritable museums of teratological specimens.

A PRELIMINARY PAPER ON DROUTH ENDURANCE.*

By Charles Bessey.

When I was asked by Professor Scott to prepare a paper on the "Morphological and Physiological Characteristics that Enable Trees to Withstand Drouth" I realized that he had asked a question specifically that has not yet been answered. We know a good deal as to this matter about plants in general, but very little as to its application to trees, and still less as to its application to particular species of trees. So I must here and now emphasize the fact that I am not able to write such a paper as I was invited to prepare. That must be left for some one who has a much more complete knowledge of the subject.

However, it may help to place the subject before the members of this congress if I analyze the problem, and attempt to show where and how the investigations must be made that are necessary to a solution of the many problems connected with the subject. Accordingly this is only a preliminary paper, and no attempt is made to reach or even to suggest final results. Whatever value it may have for this congress will be due

*Read before the Dry Farming Congress, November, 1913.

to the fact that it sets forth analytically what the problem is, and thus may suggest how it may be attacked.

There are three regions in every tree so far as the present inquiry is concerned, viz., I, the Root System; II, the Stem System, including the trunk and its branches; III, the Leafy or Foliage System. And we may direct our inquiry to these in succession, as follows:

I. THE ROOT SYSTEM.

1. **Deep Roots** appear to be more likely to withstand prolonged drouth than roots that spread nearer the surface, and this is generally conceded by plant physiologists. And yet it is well-known that in regions of deficient rainfall many plants spread their roots out in a relatively thin layer of the upper soil, the only part that is ever wet at all by the occasional rains. To what extent our trees do the same needs to be determined by examination and experimentation. Is it true with our trees that the deep-rooted species can endure drouth better than the shallow-rooted species, or do the shallow-rooted species profit by the lighter rains so much more quickly that they actually endure the drouth better than those with deep roots?

• 2. **Finely Branched Roots**, by being able to penetrate the finer interstices of the soil, as well as to come more closely into contact with the moist surfaces of the soil particles, are better able to furnish an adequate supply of water to the tree, and no doubt this is true in the great majority of cases. Yet here again I am in doubt whether this can be taken as an infallible guide. Certainly it is necessary to take into consideration other things than the fineness of the roots, as their depth in the soil as discussed above, the coarsness and fineness of the soil, the individual activity of the roots, their supply of root-hairs, mycorrhiza, etc. Here again practically the whole question needs careful scientific investigation.

II. THE STEM SYSTEM.

1. **Effective Bark.** The moist tissues of the trunk and branches are covered with a protective mass of bark, which is more or less effective in preventing the loss of water by evaporation. It is a matter of common observation that the bark of some trees forms a continuous layer or series of layers of porous tissues that must be very effective in preventing water-loss, while that of others is so deeply fissured as to expose the inner moist layers of the bark. At once we may surmise that in the former case the protection is greater, and in the latter case much less, and yet we have to admit that direct experimental data are nearly wanting. A close and critical study of the various types of bark is much needed, and will have to be undertaken before a definite pronouncement can be made as to the part taken by the bark in enabling the tree to withstand dessication.

2. **Spreading Tree-top to Shade the Trunk.** In the forest the tree-trunks are shaded from the intense heat of the sun, but in trees that

stand alone this is not often the case. It is well known to growers of trees that the trunks of isolated trees are often injured by the intensely hot sun of the dry midsummer, and this injury is known as "sun scald," yet the details of the injury are little understood. Of course this does not belong wholly to the problem of drouth resistance, and yet it is so closely related to it that it is clearly one of the things needing exact investigation.

III. THE FOLIAGE SYSTEM.

1. **Thick Epidermal Walls.** It is generally agreed that the thickening of the walls of the epidermal cells is a protective provision, and that those trees whose leaves have this structure are drouth-resistant. Yet it is a fact that some leaves of a contrary structure are known to be able to endure degrees of dryness that are fatal to others of apparently more favorable structure. Other things being equal, I think still that thick-walled epidermis is favorable to drouth endurance, and yet we can not rely wholly upon it.

2. **Protected Stomata.** A little has been done to show us that stomata differ much in their exposure to the dry air which tends to rob the leaves of their moisture, but we are far from knowing enough, and knowing definitely enough just to what extent stomata control water-loss. No doubt a stomata that is exposed to the direct air currents must lose more water than one not so exposed, but here again other factors enter into the problem to such an extent as to puzzle us very greatly. Then the number of stomata per square millimeter, their position on one or both surfaces, their activity, their responsiveness to light, long humidity, etc., must necessarily have as much to do with their efficiency in retarding water-loss as the mere matter of physical protection.

3. **Thickness of Leaf Tissue.** It has often been remarked that thick leaves are better able to withstand the dry air than thin leaves, and there can be no doubt that in general this is quite true. Certainly it is true that some plants of dry localities have thick leaves, but unfortunately for the usual generalization, there are some thin-leaved plants that manage to live in these localities also.

4. **Firmness of Leaf-Tissue.** Probably no structural character seems to indicate more certainly a drouth-enduring ability than that of the firmness or solidity of the tissues of the leaf. To a large extent the leaves of xerophytes exhibit this character, while mesophyte leaves have softer tissues, and hydrophytes still softer tissues. And on the surface it seems to be the same with the leaves of trees. Trees of dry climates appear to have harder and firmer leaves, while those of moist climates appear to be softer. Yet here again we are met by so many apparent exceptions that we are puzzled to know whether the firmer and harder leaves enable the trees to endure dry climates, or whether it may not be that the dry conditions may have made the leaves harder and firmer. In other words, we do not know which is cause, and which is effect.

5. **More Palisade Tissue in the Leaves.** Many observers have long

been of the opinion that the increase in the number of layers of palisade tissue is an indication of the ability of the tree to endure dry conditions. For myself I am pretty well convinced that there is something in this opinion, and yet I have to point out that at best this can hold only between varieties of the same species, or very closely related species. I know of genera in which the leaves of some species have but one or two palisade layers, while others have the leaf tissue nearly all palisade, and yet there is no appreciable connection between these structural facts and the ability of the plants to endure drouth.

I have now accomplished the purpose I had in view in preparing this preliminary paper, namely, that of analyzing the problem, and indicating where investigations and studies are necessary. This I trust I have done in such a manner as will suggest to the morphologists and physiologists among our foresters the necessary lines of work for the final solution of the problem.

NATIVE NEBRASKA SHRUBS DESIRABLE FOR DECORATIVE PLANTING.

By Melvin Randolph Gilmore.

It would seem most desirable to conserve and utilize all our native growths which suit themselves to our purpose for decorative planting for two principal reasons, hardiness from natural adaptation to physical conditions, and to give distinctive local character to our plantings. This second reason is no inconsiderable item, for individuality with grace and beauty of form and color is most charming.

A native shrub of Nebraska which, for these and other reasons, is highly desirable to plant where low-growing shrubs are wanted is *Prunus besseyi*, first described in botanical literature by our veteran botanist, Doctor C. E. Bessey, and named in his honor by Professor Bailey. This shrub is a dwarf cherry, peculiar to the sandhills of the Great Plains, the adult bushes varying from a few inches in height to three feet, according to more or less favorable local conditions. The shrub is of partly procumbent habit, thus adjusting itself to the unstable condition of the wind-blown sands in which it grows. It is beautiful at all seasons. Denuded of its foliage the dark purplish or reddish brown bark gives a touch of warmth. In early spring the very prolific bloom, which precedes the coming of the leaves, forms airy, fairy masses and drifts of white whose fragrance, similar to that of the wild plum, not too heavy but pervasive and evanescent, suggestive and reminiscent of the cleanness and sweetness of the unspoiled prairies, is most entrancing. Then come the beautifully glossy green leaves which maintain their color and sheen throughout the summer, varied in July and August by the presence of the large and profusely abundant, glistening purple-black fruit. In the fall the leaves remain till quite late, taking on a most beautiful coloring from scarlet to purple and bronze.

As was said before this shrub is indigenous in the sandhills, but I have had it planted for four years in the clayey drift soil of Lincoln. For one clump I prepared the soil by incorporating a quantity of sand, another I have growing in the natural clayey soil. Both are thriving.

I wish to commend *Prunus besseyi*, generally known as the western sand cherry, as especially well adapted to the purpose of park and garden planting, for its beauty of foliage, flower and fruit, for its hardiness, and for its distinctive property of local character.

REPORT OF THE COMMITTEE OF EDUCATION.

(Reprint from Conservation Congress Proceedings, 1912.)

Your committee recognizing that in the field of education we must for a time provide for a propaganda of suggestion and information, to be followed ultimately, when the public mind has been adequately awakened, with plans for a campaign of aggressive activity, now presents the following as a preliminary report. And while we feel confident that even at this stage something may be done more than the inauguration of a campaign of agitation, it is certain, nevertheless, that it is agitation more than anything else that we can best promote at the present time. And we must not belittle the importance of this stage of our work, for in every great movement there is first the period of agitation during which the "seers of visions and the dreamers of dreams" talk, and urge, and plead, with increasing vehemence and increasing confidence.

It is our privilege now to promote such a work of agitation. Accordingly our suggestions are all made with reference to this preliminary phase of our work.

There are three principal lines along which this preliminary work may be developed—namely, in the communities, in the schools, and in our law-making bodies.

I. WORK IN THE COMMUNITY.

Here we have to change the feeling of apathy, and carelessness, and irresponsibility, to one of active, conscientious responsibility. In this task we have to deal with the men and women and children who constitute the community. We must influence all of them. We must reach them in such a way that there will grow up in the community a better feeling with regard to the world we live in, and a clearer appreciation of our relation to it in every way. They must be led to see that the world is to be used, not destroyed. Just as the child has to be taught that his toy is to be enjoyed, and played with, but not wantonly destroyed, so we must bring the men and women in the community to see that preservation, and not destruction, is the higher duty. That citizen is the better one who leaves to the next generation a better world than he found; whose use of Nature's soil, and water, and plants, and animals,

leaves Nature still the rich storehouse in which others after him may find these unimpaired, and in abundance.

How shall such a high sense of responsibility be developed in the community? How may we awaken this larger and deeper altruism? How can we bring the men and women of this generation to see that they are stewards of their Master's estate?

Your committee commends three agencies as rendering effective service:

(a) Public Lectures. For these we may rely upon public-spirited men who are primarily interested in conservation, as well as many whose affiliations to different branches of natural science have prepared them to appreciate the purposes of this propaganda. To these we may add the great number of ministers of the Gospel who, nearly to a man, may be depended upon to favor the movement and to speak for it as occasion offers. Last of all, we may confidently enumerate the teachers in the public schools and the higher educational institutions, and from them we may certainly secure many regularly prepared addresses and many less formal, short, helpful talks. The influence of all of these presentations can scarcely be measured beforehand, but we confidently predict that in a few years we shall find that there has been a decided change in the general attitude of the community from one of ignorant indifference to a more or less intelligent interest.

(b) Articles in the Public Press. We believe in the power of the public press as a mold of the opinions of the community, and feel that we must enlist the interest and co-operation of the newspapers throughout the country. To do this generally will require carefully considered, nation-wide plans; but a great deal may be done in every locality by the printing of the addresses referred to above. When this is not possible abstracts may always be published, as well as summaries of shorter talks and discussions. Now and then a short, pointed article should be prepared and printed in the local paper. Here we feel the need of admonishing writers to be brief. No communication should attempt to be exhaustive. Better far to say a little at a time, and to come back to the subject again and again, than to say it all at once. Short, suggestive articles are generally read, while long ones usually become so dry that few read them.

(c) Books and Pamphlets. For certain classes of people the appeal through the more permanent form of publication is far more effective, and therefore there is in our work a need of the book writer, and the writer of pamphlets. Here, quite naturally, the writer must possess to a marked degree the ability to present the matter in such a sustained way that his book or pamphlet will be read throughout. Probably the most effective writing of this class is that which appears in our illustrated magazines, where, by the aid of half-tone reproductions of striking photographs, the interest of the reader is held much more certainly. Such articles collected into small books or pamphlets would go far towards stimulating a proper state of mind in regard to the conservation of our natural resources.

It occurs to us also to suggest that now and then our state experiment stations might quite legitimately devote a bulletin to conservation.

II. WORK IN THE SCHOOLS.

While the community as a whole is receiving such suggestions as are possible through the agencies mentioned—lectures, addresses, newspaper articles, books and pamphlets—there is a vastly more effective means at our disposal in the public schools, dealing as they do with no less than twenty millions of children. We suggest that teachers everywhere be urged to include in all the studies that pertain to nature something in regard to the preservation of natural objects. This need not be much in amount, and it should be brought in with care and wisdom. We are reminded that once a very good cause was much discredited in the schools by the rash unwisdom of its advocates who insisted upon such an overdose of advice and admonishment that acute nausea resulted. So we would suggest that in the following studies care should be taken on the one hand to suggest conservation while on the other hand still greater care should be taken not to overdo the matter.

(a) Nature Study. Along with an appreciation of nature there should be inculcated the feeling that others after us should have the opportunity of enjoying the same beauties that we have.

(b) Geography. As now generally presented, this deals more with the earth and what it contains than with its political divisions. Thus the soil, the forest cover, the streams, the water supply, all fall within this rejuvenated science, and here most readily can be inculcated the principles of conservation, as applied to the soil, the forests, the streams, and the underground waters.

(c) Botany. When the pupil's attention is more specifically drawn to the plant covering of the earth, in the study of botany, it is not at all difficult to impress upon him the desirability of preserving the vegetation of the present day for the generations that are to come after us. No lover of plants can contemplate with pleasure the thought that for the botanists of the twenty-first century certain curious orchids, some rare trees, and possibly some golden rods, may be as completely extinct as are the paleozoic calamites and lepidodendrids. The latter perished from the face of the earth, and we know of them now only by the fragments that have been preserved in the fossils which we dig up from the old rocks. Extinction has been the fate of many a plant, and extinction of plants now living is by no means improbable. The botanical teacher should preach the doctrine of preservation, the preservation of the plants of the present for the people who come after us.

(d) Zoology. So, too, the teacher of zoology should improve his opportunity to help create a feeling favorable to the conservation of the present animal life. Especially do we need a propaganda of conservation in relation to the birds of the country. And here we remark that there are methods of presenting this part of zoology which emphasize rather the living bird in the tree than the dead bird in the cabinet.

And these methods are happily displacing those that suggested if not required the death of every bird studied. We are well aware of the fact that it is not so much the killing of birds for study that threatens the extinction of some species, as the wanton killing for the sake of killing, and, as in the case of birds of fine plumage, the killing for the money value of the dead birds. Yet we realize that the place to begin is to educate the children of the schools not to kill birds for any purpose. When they have regard for the life of a bird they may be trusted not to kill one needlessly.

(e) Geology. In this the pupil comes to see the foundations of the earth, fortunately little of which man may injure or deface. And yet how thankful we are that on the hills of New England there have been preserved in their original ruggedness the great masses of granite that have withstood the elements for millions of years. And who is not gratified that the great wall of the Palisades on the Hudson river has been saved for all time? These cliffs were valuable for crushing into gravel for road-making and for the quarrying of building stone, but certain men of fine sensibilities felt that the Palisades had a far higher value for their grandeur and beauty. And so the Palisades were saved.

We need more of this fine sense of the value of rocks, and lakes, and waterfalls, and cliffs, and mountains, and of the need of their preservation.

(f) Conservation Clubs. Aside from much that may be done in school classes to foster a spirit of conservation something further may be accomplished by taking advantage of the club-forming instinct of children. Conservation clubs, conservation leagues, conservation guilds, pacts, societies, or what-not, may be suggested by the wise teacher, who can discreetly keep himself in the background while the youngsters do the work. If a nauseating namby-pambyism can be avoided such clubs may be joined by even the most vigorous of boys, the very class in whom it is desirable to develop the spirit of conservation.

III. WORK THROUGH LEGISLATION.

What has been already outlined is probably enough for the present, but the American people are not satisfied unless something is done in the way of enacting our ideas into laws. In the present condition of society we act as though we thought it quite impossible to do anything on a large scale without having the sanction of a direct law in regard to it. We are only very slowly learning that some of the best of human activities have been developed independently of legislation, and no doubt the time will come when we shall not be so anxious to have our plans formulated into laws found in our statute books. But for the present we may suggest the following legislation as helpful. We purposely avoid suggesting the passage of laws dealing with details. They must come later, when the conservation sense of the public has been adequately aroused. Here we may consider state and national laws.

(a) State Laws. These may well include those intended to preserve rare birds, and in some places certain rare plants which are in danger

of extermination. To these may also be added provisions for the preservation of important natural features, as forests, waterfalls or massive rocks that lend interest or beauty to the general landscape.

(b) National Laws. These may deal with larger problems, as the preservation of certain widely distributed birds. Naturally, too, it is the national government that must take the initiative in regard to the conservation of the great forests, waterways, waterfalls, and the features in the national parks and reserves.

Carefully drawn laws, both state and national, covering the foregoing will no doubt aid the cause of conservation. Too much must not be attempted. More good will result from a constant vigilance with regard to the passage of bad laws which give away the heritage of the community, than from attempts now to formulate a general conservation code.

Respectfully submitted,

CHARLES E. BESSEY (Chairman.)
DAVID STARR JORDAN,
EDWIN A. ALDERMAN,
E. T. FAIRCHILD,
EDWIN B. CRAIGHEAD,

Committee.

GROWING BLACKBERRIES.

Written for Green's Fruit Grower by J. S. Underwood, Illinois.

Some are of the opinion that blackberries can be grown successfully on any kind of soil, but I wish to state from my own experience that to produce blackberries of first quality the soil must be rich. In preparing the ground, I plow very deep and put it in the best possible condition. I lay the rows off six and one-half feet apart in the row. This allows sufficient room for cultivation, and afterward to pick the berries.

In setting the plants I have one man go ahead and lay them in the row and another man follow with a hoe and draw the earth over the roots and firm it with his feet. Another man follows with a small turning plow, throwing earth on both sides of the plant row, thus filling trench and leaving plenty of mellow earth to hold the moisture. As to the best varieties to plant will depend to a very great extent on the locality in which they are to be grown. Some varieties will answer for one section, while others will not. For this reason it is best to obtain the advice of some local nurseryman, and, if possible, plant home-grown varieties. I am thoroughly convinced of the fact that some have failed to be successful in growing blackberries simply because they tried to grow kinds that were not adapted to their soil and climate. I am growing three varieties, all of which are well adapted to my soil and locality. They are the Lawton, Jr., Erie, and Early Harvest. The Lawton, Jr., is very hardy and bears heavily. The Erie is an excellent variety and

somewhat resembles a large black raspberry. The Early Harvest is the best early blackberry, is a good bearer, quite free from rust and commands a good price in the market.

April and May are the best months in which to plant blackberries, although they can be planted in October and November with fairly good success. One must not be surprised if the plant does not begin to grow immediately after being set out. We must have patience with all kinds of plants and trees and not expect them to start leaf growth soon after being planted. Sometimes growth does not begin on the blackberry for nearly a month after planting, and yet if the ground is kept well cultivated shoots will probably spring up from the roots and make a vigorous growth. The first year after planting I grow potatoes or some quick maturing corn between the rows of my blackberries which does not injure the plants, and at the same time practically pays for all the expenses. I use the hoe freely and plow with a two-horse cultivator. Late in the fall, before the ground becomes too wet, I throw earth well up to the plants to prevent heaving out during the winter, and also leave furrows to drain off surplus water. The second and following springs I work the space between the rows shallow until the fruit is well advanced, thus counteracting to a very great extent the effects of a dry season. Blackberries bear their fruit on summer shoots arising from winter buds on one-year-old wood. After a cane has borne one crop it dies, and is of no more use to the plant. Its place is taken by new canes which will bear the next year's crop.

The pruning of this fruit consists of four distinct operations; first, removing superfluous shoots from the base of the plant, so that there will not be too many canes in a hill; second, summer nipping of the remaining shoots, to induce a stocky growth and a strong development of laterals; third, heading back these laterals the following spring; fourth, cutting out the old canes after they have borne their crop of fruit. The proper number of shoots for a hill will vary somewhat with the variety, but in general will be from three to five. The shoots which are not to be left to produce canes should be removed as soon as they start, so that the strength of the plant may go to those that remain. When the shoots have reached a height of eighteen to twenty-four inches they must be nipped back. This operation consists in simply pinching off or otherwise removing the growing point or tip of the shoot. It can be done with the thumb and finger or with a pair of sheep shears. It is especially important that the shoots be nipped when they reach the height above mentioned, instead of being cut back to that height after growing beyond it. A long cane with all the laterals near the top is likely to lop over nearly or quite to the ground when laden with fruit, unless it is given some artificial support. If the shoots are nipped at the proper time, that is, when they have reached a height of eighteen or twenty-four inches, they will develop into strong, stocky canes, well supplied with strong laterals, and, in the case of most varieties, capable of holding up the fruit without the aid of artificial support. As to tools, sheep shears can

be used to advantage in the summer nipping of the canes. Pruning shears are almost indispensable in the cutting back of the laterals in spring. A pair of two-hand pruning shears or a spring bush hook will be found to be the proper tool for cutting out the old canes. The most troublesome disease that attacks blackberries is the rust, and it is very hard to get rid of. However, I dig out every plant, root and all, that becomes infested with rust, and have in this way held the disease in check to some extent.

WASTE IN DISTRIBUTION TOO LARGE.

Charles R. Van Hise, President of University of Wisconsin, before First National Conference on Marketing and Farm Credits, Chicago, April 8, 1913.

For farm products the waste in distribution is admitted by every one to be large. There can be no question that the waste in distribution for agricultural products is far greater than for manufactured products, and for the country as a whole is to be reckoned each year in hundreds of millions of dollars. This is partly a consequence of the relatively perishable nature of many of the farm products. Just as there is a difference in the amount of waste in distribution of farm and manufactured products, so there is a very great difference in this respect among farm products themselves. For the relatively permanent products of the farm, which need not be disposed of at a given time or may even be held a year, the wastes are far less than for the more perishable products. Therefore the unnecessary wastes in distribution for wheat and corn and cotton are relatively very much less than for the more perishable products. Here are included vegetables and fruits. Also for these products there are great variations in the amounts of waste. Potatoes must be marketed before early spring else they are a total loss; but there are several months available for marketing and distribution. In the same position as potatoes are the more stable fruits, such as apples and oranges. But the less stable fruits, such as berries, must be used within two or three days from the time they are taken from the farm. This fact greatly limits their radius of distribution and therefore of available markets. Indeed some fruits are so perishable that they will not stand shipment any great distance even with modern refrigerator facilities.

The perishable nature of fruits and vegetables, combined with the great fluctuations in the acreage from year to year and in the production of the same acreages in different years, results in a fluctuation of price for vegetables and fruits even of the more stable kind, such as is not paralleled by any other articles of commerce. The fluctuation in the prices of the same product in the same year at wholesale rates may be from 100 to more than 400 per cent. This large fluctuation is one of the factors which tend to make the retail cost of perishable goods very high. When wholesale prices go up, retail prices are promptly

advanced. When wholesale prices fall, by informal understanding, the retail prices are frequently held at the old rates; or, if not, they lag greatly behind the falling wholesale prices. This is one of the circumstances which cause a wide margin between the price the farmer receives and that the consumer pays.

Under any system of distribution there will be a certain percentage of loss for perishable articles, and this fact results in a wider margin between the two than would otherwise be the case. However, when we consider the very wide margin which now often exists it is evident that the cost of distribution is excessive. I have no doubt that many delegates to this conference could furnish illustrative instances from his own locality. Therefore I confine my statements to type cases. For some of the relatively permanent products the margin between the producer and the consumer can be diminished by only a moderate amount. For instance, in the case of cheese, which, according to Professor H. C. Taylor, may bring the farmers in Wisconsin eleven to thirteen cents a pound, may sell in the South and West in different seasons of the year from twenty to twenty-five and even thirty cents a pound. There is an average margin of about ten cents between the Wisconsin prices and the retail prices. This amount covers paraffining, storage, profits of the original buyer, the wholesaler, the retailer and transportation. While perhaps the service performed by these agencies can not be secured by other means at a greatly reduced cost, it may be possible by proper methods to reduce the margin by two or three cents per pound; and even if this were done it would mean an increased income to the farmers of twenty per cent or more and a much larger percentage of profit above the actual cost to them.

With vegetables and fruits the situation is very different. Governor Francis E. McGovern in a recent message to the legislature of Wisconsin mentioned the fact that at one time when the farmers were selling potatoes for thirty cents a bushel at the railway station in Waupaca county, the consumers in the city of Milwaukee were paying eighty-five cents a bushel. The expense of shipping was six and one-half cents a bushel. This made the amount which went to the dealers between the producer and the consumer thirty-eight and one-half cents, or a margin of 133 per cent above cost. Governor McGovern gives as another instance that cabbages which were selling at \$83 a ton at River Falls, Wisconsin, were selling at \$300 a ton in Chicago. The freight between the two points was \$3. Thus the commission merchant and the retailer in Chicago received as a margin \$.117 a ton, or 250 per cent beyond cost.

Last autumn a gentleman shipped a carload of apples from Missouri to Madison, Wisconsin, which he sold to the wholesaler at \$1 per hundredweight, or fifty cents a bushel. The wholesaler to whom he disposed of the apples sold them for seventy-five cents a bushel and the retailer sold at \$1.25 a bushel. The amount which the wholesaler and retailer took at Madison was, therefore, seventy-five cents per bushel, or 150 per cent above the amount which the producer received for raising the

crop and transporting same to Madison. With very perishable goods hundreds of instances of extreme wastefulness could be cited in which the farmer not only has a total loss of his product but freight to pay. Thus at various times there come into the markets of the northern states a larger supply of melons or peaches than can be disposed of at the current prices. The retailers take advantage of the situation to purchase at a lower price from the commission merchants; but not infrequently they find it more profitable to them to maintain existing retail selling prices with smaller sales than to lower the price sufficiently to dispose of the additional material. Under such circumstances carloads, and even shiploads, of fruit or melons may rot when the people—and especially the people in less favorable financial condition—would have been glad to have the products thus destroyed if they could have been obtained at a low price.

After a farmer has had an experience for any year like the above he stops shipping, and the remainder of the material rots in the field. For instance, last summer this was the situation in Colorado with regard to cantaloupes. Vast quantities of splendid fruit were a total loss, and yet prices for cantaloupe at the various markets of the middle West and East were high. At Madison, Wisconsin, the lowest rate at which good Colorado cantaloupes were selling was ten cents each in lots of ten or a dozen. Every year furnishes many illustrations like the above. Not only does this occur, but our distributing system is so bad that sometimes even the semi-permanent vegetables are a total loss to the farmer because of a glut of a certain market. For instance, the April number of *The World's Work* tells of an instance where a farmer was advised by a commission merchant that the market for onions at Philadelphia was good. After making shipment the farmer received the information that onions were arriving in such quantities that the market might break. When the farmer received his statement from the commission merchant he found that his carload of onions had sold for enough to cover all charges except \$9 of the freight, and he was asked by the commission merchant to remit that amount. Says the farmer: "I still think he is an honest commission man if there ever was one; and I don't know that any one was particularly to blame. But I do know that I furnished Philadelphia with a car of good onions free and paid part of the freight; and I have no doubt that the other twenty cars that went in at the same time were furnished free. But I hope the other twenty farmers were not fools enough to pay the freight." With satisfactory methods of distribution situations like the above, which occur in numerous localities and for various products almost every year, would not exist. Certainly we must work out some methods of distribution under which abundant crops will give larger returns to the farmers than small crops; yet the latter is now frequently the case for products which are perishable or semi-perishable, and is sometimes true for the more permanent crops. This must cease to be true else the principle of conservation which demands that we increase the productivity of the soil is wide of the mark.

I understand it is the purpose of the conference to contribute to the solution of the problem of efficient distribution, but no more than general suggestions can be offered in an introductory address. We shall all doubtless agree that its solution rests about the word cooperation—cooperation of the producer, cooperation of the consumer, cooperation of the distributing agency with the producer and the consumer. If this be conceded, one fundamental principle in connection with it should be understood at the outset. Cooperation involves surrender of independence. If two people agree to cooperate in regard to any matter it means that each one of them surrenders some measure of his freedom. If one hundred people agree to cooperate it means that each one of them must largely surrender his independence in handling the matter in question. Cooperation means the rule of the majority and that every man who joins in the cooperation must abide by the conclusions reached. Not only so but the business officials of an association must have delegated to them the necessary power to carry on the affairs of the cooperative society in the same efficient and authoritative way that do those of an ordinary corporation. Cooperation can not possibly succeed if the officers do not have the proper authority and support.

This surrender of freedom is one of the broad principles which is frequently overlooked and is an especially difficult point in dealing with the American farmer. He prides himself upon his independence in production; he is confident of his business ability; he will decide for himself. But in order to have the cooperative movement succeed the farmer must agree to circumscribe his liberty in many respects; and, furthermore, must live up to his agreement. A second point requiring consideration is the relation of cooperation and combination. The idea of cooperation is everywhere hailed as a desirable thing for the farmer, and this is true at a time when there is equal denunciation of combinations of the kinds commonly called trusts. But it should be fully understood that combination by the manufacturers is for the very same purpose that cooperation is designed to cover for the farmers. The idea is the same in each case; the word is different. Why is it, then, that cooperation is hailed as a great advance step for the farmer at the same moment that combination in industry is assailed?

What are the purposes of combination? They are limitation of output, division of the market so as to avoid cross freights, the maintenance of prices, the securing of transportation at reasonable rates. What are the purposes of cooperation? They are the division of the markets so as to avoid cross freights, the securing of transportation at reasonable rates and the maintenance of prices; and those who are most enthusiastic for the cooperative movement have even advocated limitation of output. Thus, while the combination of manufacturers and cooperation of farmers have the same purposes, it should be pointed out that the danger to the consumers of cooperation for agricultural products is not nearly so great as is combination for manufactured products. In the first place the producers of an agricultural product

in the United States are so numerous and so widely distributed that there is not the possibility for combinations which extend to monopoly that there is among manufacturers. The independent producers of an agricultural product may number millions; and from this great number they grade to a few thousand for some products. The vast numbers of producers are widely distributed, and it is not practicable for them to unite in limiting the total output. If one crop has been unprofitable one year the farmer may turn to another the next year, but he can not cease to utilize his improved land. Thus limitation of output as a whole is impracticable. Again, one food product is in competition with another; and thus if the producer should attempt to push the price of one article too high the consumer will turn to others, and under these circumstances the product, if perishable, may go into the dump. Even where agricultural cooperation has developed so as to become almost monopolistic and the consumers have not been taken into the cooperation, as in the case of citrus fruits and cranberries, the prices can not become exorbitant, for, if so, the consumer will refuse to buy.

While, therefore, the dangers of cooperation among the farmers are not so great as they are among the manufacturers the same principles apply, and some of the same abuses may arise if not guarded against. If the farmer could completely succeed in the purposes of cooperation and should wholly ignore the interests of the consumer we should have the same outcry against the farmer that we have against the trusts. This should be fully understood at the beginning in order to avoid this danger. The way to do this is plain. The program for cooperation among the farmers should also include cooperation with the consumers. The program of those who are in favor of reducing waste in distribution should have the twofold purpose of increasing the price to the producer and decreasing the price to the consumer.

There is little question that a system of distribution can be worked out which will accomplish this. Of course such a system will vary from place to place and be different for different commodities. As illustrating the possibilities there may be formed in any center a cooperative association which is both a buyer and a seller. This cooperative association would consist of members who produce and members who consume; and indeed many of such members would belong to both classes. The cooperative association would receive and sell the products of all of its members at the current prices. Such portion of the material as possible would be disposed of locally. The material which could not be handled in the local markets would be disposed of in other markets. The ordinary well-known rules for successful cooperative societies should prevail, such as the limitation of dividends on the stock, one man one vote, etc.

It is realized that the above simple illustration by no means fully covers the situation. There has been a marked tendency in recent years for the production of agricultural material of a certain kind to be concentrated in certain districts, just as there has been in manu-

facture. This has been one of the results of the modern development of cheap transportation. Before the time of the railroad the products of any agricultural district were largely consumed in that district. Each district also aimed to produce as many of the products there consumed as practicable. The export money crop was often a concentrated one which would bear expensive transportation charges. However, at the present time the entire range of the United States, and for many products, European countries are available as a market for the output of a given locality. Thus the cheese of Wisconsin goes to all quarters of the United States and parts of Europe. The cotton of the South goes to the mills of the world. In consequence of this situation special cooperative associations are advisable for the marketing of the money crop or crops in a definite district; and such an organization may be exclusive rather than broadly inclusive. But even where this is the situation the farmers have other products; they also are consumers as well as producers, and there is therefore the need of a cooperative association which buys other than the standard crops and which sells as well as buys in order to furnish the farmers their necessary supplies.

In some instances the work of the special and general associations may be merged, in others separate. Thus the work of buying and selling from the point of view of bettering the circumstances of the farmer may require that the cooperative buying and selling shall be through a single association in some districts, in others through several associations; but the essential point should be insisted upon, that the advantage of the cooperation should not be confined to the farmers alone, but should be shared by the consumers—that is, that the cooperative associations should permit membership of any one who wishes to do business with the association. If this be done the surplus of profits beyond the limited amount which goes to capital would be divided between the men who did business with the association in proportion to the business done, producer and consumer being exactly on a par in this respect. To illustrate: If the producer contributed \$5,000 worth of material, and the surplus which could be declared beyond the necessary reserve at the end of the year amounted to eight per cent, he would receive in addition to his original selling price \$500. Similarly, the member who had purchased \$1,000 worth of goods would get a rebate of \$80. If the same man did both of the above he would get \$580 at the end of the year. Non-members who did business with an association might be excluded from sharing in the profits of the cooperative enterprise; or, on the other hand, they might participate to a less extent—say fifty per cent. This latter is believed to be the better plan, since it would result in extending the business of the association and thus increasing the profits. The method of cooperation above advocated has the great merit that all who have any relation with or necessity for the articles handled will be in favor of the success of the movement. The consumer shares in its benefits as well as the producer. In order to complete the program of cooperation it will be necessary to correlate with the above a system

of rural credits and rural banking, but this part of the subject is to be considered by other speakers.

I have pointed out elsewhere that there exist almost everywhere in the United States at the present time, notwithstanding the national and state anti-trust laws, contracts and combinations in restraint of trade, either formal or informal, under which the same price is charged for the same article at a given point by all of those who handle it. Thus, for standard articles, it makes little difference from which dealer one buys, at a given locality the price is the same—and usually the price is too high and often is exorbitant. This condition of cooperation widely exists, not only among the manufacturers but among the retailers. If the plan of cooperation advocated, which includes both producer and consumer, were substituted for the above the evils would be abated in large measure, for in case the price proved to be excessive the producer and consumer would share in the resultant profits at the end of the year. Therefore the cooperative movement proposed for the farmers would be in strong contrast with the great combinations which have existed, and still exist, among the manufacturers, the purposes of which have been to benefit the producers by levying the highest possible tribute upon the consumers. The amount of tribute which has been levied by the great combinations of industry during the past decade, as we well know, has been enormous. This is illustrated by the incredible profits of the Standard Oil company, the American Tobacco company, the United States Steel Corporation, etc. If the cooperative movement among the farmers includes as its fundamental doctrine benefit to the consumer as well as benefit to the producer, the most dangerous rock in the channel of progress will be eliminated; and while there may be many other difficulties in clearing up the channel it is believed that none of these will prove to be insuperable.

Working out methods of proper cooperation will require a consideration of the existing trust laws, national and state. The decisions of the United States Supreme Court under the Sherman act are very drastic in regard to all contracts in restraint of trade. But the members of the cooperative society, to be successful, must contract to sell all of their products through the society; or, if not, to give the advantage to the society of any increase of price over that obtained through the regular channel. An essential element in the success of the fruit growers' exchanges, perhaps the most successful of the cooperative societies, is that they are selling agencies for all their members, and rigid contracts require the members to dispose of their products through such agencies. Selling agencies of this kind for manufactured products have been declared to be illegal; indeed the decisions under the Sherman act have uniformly held that selling exchanges and combinations, where the commerce was clearly interstate, which fix prices, divide territories or limit output, are illegal. And yet some of these things must be done if cooperative societies are to be successful. Similar decisions have been rendered by many of the state courts under the state anti-trust laws.

The fact that the anti-trust laws are in conflict with the necessary cooperation among farmers has been recognized by the legislatures of a number of states, and in consequence cooperation among the farmers was excepted from the anti-trust acts. This is illustrated by laws passed in South Dakota, Illinois, Nebraska, and Texas. These laws, however, have been declared unconstitutional by the federal courts under the principle that "no state shall deny any person within its jurisdiction equal protection under the laws." It thus appears clear that to reduce the waste of distribution and to successfully introduce cooperation will require a modification of the existing anti-trust laws, national and state. The farmers can not hope to claim for themselves the advantages of cooperation without permitting similar advantages to those engaged in other lines of industry. It is true that the privileges of cooperation have been abused by the great concentrations of industry, and they have not been abused by the farmers, but the remedy for the abuse in the case of the manufacturers consists not in prohibiting the advantages of cooperation, but in prohibiting the evil practices which have arisen in connection with combinations. The rising flood of the cooperative spirit, which is characteristic of this twentieth century, will—laws or no laws—sweep the country and eliminate the frightful wastes of the existing competitive system; but this without destroying competition and at the same time keeping free and open full opportunity for all. With the privilege of cooperation will of necessity go public regulation wherever the market is controlled in consequence of the permitted cooperation. It is not the place here to indicate the methods by which this may be accomplished, but if the principle be agreed to there is no doubt that regulations may be worked out successfully to accomplish this end.

In conclusion, the keywords of the solution of the industrial situation of the farmer are cooperation among themselves, cooperation with the consumer for their mutual benefit; and this in order to eliminate the great wastes of the existing distributing system and thus secure efficiency.

GROWING FANCY STRAWBERRIES.

Written for Green's Fruit Grower by H. B. Burt.

To grow fancy strawberries, a person must not only know how, but must also be willing to put in some of his or her time in what we sometimes call "puttering," and also, to a certain extent, at least love the work.

And right here I want to say that growing strawberries is a nice, pleasant, and profitable work for women, and many are earning their pin money in that way; and there is plenty of room for others to get into the game; and for the business or professional man who likes to "play in the dirt," this is a pleasant and interesting pastime.

The first essential is a location. If you have a farm you can usually find your ideal location, but if you have only a city or town lot you

have not much choice. Many are under the impression that sandy soil with a southern exposure is the only place where strawberries can be grown, but this is not so. While it is true that sandy soil is usually easier to work, you can grow just as fine specimens on the stiffest clay soil, for I have grown them there myself; and although the slope or exposure may have more or less effect on the growth of the plant or berry, I do not consider it of nearly as much importance as some growers; but I would not plant on low, swampy land if a higher place was available, on account of the greater liability of damage by frost on the low land, for we all know that cold air, like water, will go down hill.

An ideal soil is usually a clover sod that has been planted with corn or potatoes and followed the next spring with strawberries. The clover furnishes the humus that is needed for best results, and if possible, plow late in the fall. But if you can't plow in the fall, plow as early in the spring as possible, and before setting plants roll and harrow until the soil is fine and compact.

When setting out plants, we use a line instead of marking for the reason that a mark is liable to dry out, and we want our plants in moist soil always.

We have our rows four feet apart and set plants three feet apart in the row. On rich soil plants set this distance will get too thick for best results, if runners are allowed to grow unrestricted. Plants should be at least one foot apart for largest berries. We use a trowel to set with and always shorten the roots to about four inches. It takes time, but I like to have a handful or two of rotten manure mixed with the soil under each plant. All blossoms must be kept off the first year. Cultivate or hoe often. After plants start to grow, we scatter a good grade of commercial fertilizer around each plant and hoe it in.

When the runners start growing, they should be placed where you want the plants. A stone or clod will hold it in place until the plant takes root. After you get sufficient plants, runners should be kept off the balance of the season. In July or August cover the ground between the plants with rotten manure to the depth of two or three inches; the object of all this is to get as large individual plants and crowns as possible. This is about all that is necessary until time to cover them for the winter.

For winter covering there is nothing better than straw horse manure put on three or four inches deep. When growth starts in the spring, remove litter from over the crown of the plant; we then scatter nitrate of soda around the plants and again when they are in bloom, and we also use liquid manure around the plants once or twice a week. Of course to get the largest berries a good share of the fruit buds must be clipped off.

I can not tell you which varieties will do the best for you, as few varieties do well every place. I have tested perhaps one hundred varieties, but for main crop never grow more than two or three.

Some of the older varieties still give my largest specimens. The old

Bubach and Sample and Nick Ohmer are still hard to beat when size is considered.

It is a good idea to get varieties that do well in your neighborhood, rather than to pay the exorbitant prices for new varieties that are very often inferior in every way to some of the older ones.

FORTUNES IN APPLE JUICE.

HOW EVERY DROP OF WASTE JUICE MIGHT BE UTILIZED.

C. A. Green in Green's Fruit Grower.

Americans are wonderful people, full of ingenuity, enterprise, and progressiveness, but it is clear that they have not given much attention to the production of cider.

I am told that the waste product from American dry houses is shipped to Europe and comes back to America bottled under the label of champagne, selling at \$2 or more per bottle. Whether or not this is true I can not testify positively, but it is said to be a fact that champagne is made from apple juice and not from grape juice.

But this article is not of champagne, but of cider, simple apple juice without any fake name attached.

It is possible to make from apples a quality of cider of such attractive and delicate flavor, and such attractive sparkle, that it will sell for a higher price than good grape wine.

The difficulty is that apple growers and cider-makers have not given this subject attention. That is, the most of them have not. I know of a firm which has succeeded in making from apple juice a quality of cider that sells for an extravagant price and is in demand bottled all over this country and from which the firm is making fabulous profits.

Why not get some man like Edison, some delver into the secrets of nature, some experimenter, some man who can earn a big salary by working a year or two, or if need be ten years, on this question of how to make a delicious and wholesome drink from the juice of apples.

Cider as made at present comes from immature apples, over-ripe apples, wormy and rotten apples, and from various varieties of apples without any regard to selection of good from bad or desirable from the undesirable. Thus cider as made today is a sort of a hodge podge manufactured with little regard for cleanliness either in handling, storing, grinding or in barreling. Much cider is injured by being put in barrels that are not clean, but poor as is the average cider as now made, it is consumed in large quantities and makes an outlet for a large amount of windfalls that would otherwise go to waste.

Rest assured that the man who succeeds in making a superior quality of cider, such as I have indicated, will make a fabulous fortune. Not only this, but he will save from waste hundreds of thousands of carloads of apples that fall from the trees and are not desirable for packing for winter.

When I was a boy on the farm I looked forward eagerly to the fall months when sweet cider was plentiful on the farm. How good that cider tasted! It was far better than the cider made today, and richer. The common cider today has a lot of water in it. Over the hills to the southward from our farm were three brothers, enterprising farmers, who owned a cider-mill. One notable thing about this cider-mill was that no farmer could get any cider from this mill. If he delivered his apples to the mill he was paid for them in cash, but not in cider. These brothers had a reputation for making high grade cider, which was not sold locally but which was barreled and shipped to distant cities. It is said that the brothers had some mysterious method of clarifying the cider, but I suspect that they not only clarified it in a superior manner, but that they were more cleanly and systematic in the selection of varieties and in sorting out the decayed fruit, and in other ways took great pains to secure a high grade of cider.

COOPERATION IN FIGHTING INSECT PESTS.

By Geo. P. Weldon in Fruit Belt.

The man who puts forth his best efforts in trying to control insect pests, with only partial success, is apt to blame the negligent neighbor because he did not meet with better success. While it is sometimes true that the individual can protect his own crops, regardless of what his neighbor does, it is more often true that he can not meet with the greatest success unless his neighbor adopts proper methods of control also.

Most of our destructive insect pests travel freely from place to place, and the work of only one farmer fighting certain of them may lessen the whole number an inappreciable amount, and do neither himself nor his neighbors any permanent good.

The grasshopper is a good illustration of a pest of this type. They sometimes travel great distances, the limit depending upon how far they have to go to find food. While one may destroy practically all the hoppers over a certain area, by putting out poison early in the season, his land is likely to become reinfested from adjacent areas unprotected by poison before the end of the season.

Only a few days ago I was talking with a nurseryman who had met with splendid success in poisoning grasshoppers with bran and Paris green, in his young nursery. The poisonous mixture was scattered about the field early in the season, just as the hopper eggs were hatching. This particular nursery was fortunately enough located so that neighboring hoppers did not come into it in large numbers. The nurseryman, however, made the statement that he would not dread grasshoppers any more himself because he felt sure he could keep them down pretty well on his own land, but that he did feel uneasy for his own safety when neighbors who had as good a chance as he to protect themselves were negligent and did nothing.

When any insect pest becomes well established in any section of the country, complete eradication becomes impossible. The question of fighting it, then, resolves itself into a question of reducing its numbers sufficiently to protect the particular crop or crops affected. The problem of the entomologist is not, as is sometimes thought, how can this pest be exterminated, but how can it be checked?

The most efficient work can be done only when people get together and adopt proper and uniform methods of control. The necessity for cooperation in this work brought about the passage of a Pest District law by the last legislature. Under this law it is now possible to organize in a certain district, not to exceed thirty-six miles square, and with the aid of the county and district inspectors and the state entomologist, to adopt proper and uniform methods of control for any particular pest throughout the district. This law should be very advantageous in certain sections where grasshoppers are bad, and, in fact, in sections where orcharding is generally practiced, and codling moth, San Jose scale, or other pests are serious.

It is hoped that another season will see some of the districts in operation. The writer will be glad to give full particulars in regard to the organization and support of such districts.

THE HYGIENE OF APPLES.

Written for Green's Fruit Grower by Myron T. Bly, Rochester, N. Y.

A good friend was lately bemoaning the state of his health. Among other evil things he had an excess of uric acid—one of our modern banes, but perhaps no less a bane for all that. I suggested that he eat apples. He had heard, without questioning the authenticity of his information, that apples would render more acid an already acid stomach. Any way they did not agree with him. And so it happened that we came to a discussion of the hygiene of apples. Briefly stated we went through the following course of reasoning:

A green apple is a sour and indigestible thing because it is brimming full of raw starch and citric and malic acids. Moreover, it has a high percentage of fiber content—cellulose, the chemist might call it. The gastric juices of the stomach can not digest raw starch unless saliva is thoroughly incorporated with it in the process of mastication, and the very best gastric juice has hard work digesting cellulose. But the process of ripening on the tree is a process in which the amount of cellulose is reduced or converted into plain water and the starch converted into sugar. It is done by the action of sunshine and atmosphere working in conjunction with the live contents of the apple. A ripening apple is a living thing, drawing nourishment not only from its parent tree, but from sunshine and atmospheric elements.

Our first conclusion then is this: The weak stomached person should eat only those apples which have reached the flower of maturity

on the tree. But even a perfectly matured apple has some starch and cellulose in it, and so our second conclusion is that when the weak stomached man eats apples he should masticate and masticate until the pulp is practically converted into saliva. It will then be admitted that such apples so eaten will not give any one indigestion. Thank heaven that most of us have stomachs which never rebel at any kind of an apple.

The case is illustrated by a high colored Northern Spy which matured on the sunny side of an open branched tree, standing on a hill top. It lived and grew in a full flood of sunshine and air current. Then consider a green livered, under-colored specimen that grew in the shade on one of the under branches. Its parent tree may have stood tucked away under a hill where it got little sunshine and no air movement. Moreover, maybe the grower took no chances with frost and wind and picked it in its youth. It is suggestive of quinine. We don't have to recall what the flavor and bouquet of the high colored, ripened apple suggests. We remember that.

Having disposed of the matter of indigestion, we come to the matter of the acid. That is easy. We have only to produce the medical authority for the statement that the gastric juices of the stomach convert the citric and malic acids, found in all apples, into the salts of potassium, and that potassium salts are a corrective of uric acid. That statement, when once appreciated, should banish all fear that uric acid may be produced by eating apples. We are fast coming to an understanding of these things in modern days. For instance, the matter of diet is a matter of life or death in case of typhoid. But it is good medical practice nowadays to give the patient baked apple or scraped raw apple. The insane have no power of selection in the matter of their diet, but the state of New York, as well as other states, lays in a season's supply of apples for the patients in its asylum hospitals, considering the fruit just as much a necessity of diet as eggs, butter, or flour.

We are creatures of habit, and there are few of us who can not habituate ourselves to whatever is proper and good for us. If one has not been accustomed to eating apples it might be well to commence with half of one at a time. Better still commence with a right baked apple. That means the right variety rightly baked. The York Imperial is a right variety and it bakes right. It has the right degree of acidity. It doesn't collapse and run all over the cooking utensil and come out of the oven neither baked apple nor apple sauce. Snip out the calix. Take out the core from the stem side without cutting clean through, and fill the hole with sugar. Don't peel off the jacket. Bake in a fairly hot oven. The York Imperial then comes from the oven done through yet retaining its natural shape, unshapely though that be. You know it is a baked apple by the golden, juicy cracks, where the flesh comes bursting out. The skin is almost as tender as the flesh. It is safe to recommend the York because it comes from the Southland where there is always enough sunshine to ripen the fruit on the tree. In the time of Charles Lamb they did not have such baked apples. Otherwise subsequent generations might have enjoyed an essay on roast apple instead of roast pig.

HOW TREES LIVE AND DIE.

Secrets of Their Growth From Green's Fruit Grower.

Whenever man reaches a full realization of the importance of the proper treatment of trees our trees will become "a thing of beauty and joy forever." In a current issue of the New York Commercial we find this splendid treatise on the tree. It says:

Trees literally, breathe, inhaling oxygen and exhaling carbonic acid gas. The leaves are the lungs of the tree. On the lower surface of the leaf are vast multitudes of minute mouths or openings (100,000 to the square inch, it is estimated) which admit the air and expel the carbon.

There are other openings, called lenticels, in the bark, dots and lines which can be easily seen on the twigs and smooth branches, which help the leaves just as the pores of the skin help the lungs. The perspiration of plants is technically known as transpiration.

The exhalation of water from the leaves is very great. That from a large oak is estimated at 150 gallons a day during the summer. The evaporation of water from the forests is fully as important as that from the ocean, if not more so. The ocean alone could not produce rain enough to sustain vegetation.

The roots also are active in taking oxygen from the air, which is always active in porous soil. A tree may be smothered by piling earth on its roots or hardening the soil around them, says the Christian Intelligencer; it may be drowned by keeping its roots water-soaked. Coal gas will choke it.

The tip ends of the tree roots absorb moisture from the ground, even in zero weather, but the passage of water from the roots up the trunk is retarded until winter relaxes its hold. The largest roots anchor the tree to the soil and do but little else. The slender rootlets and the tips of the large roots collect all that part of the tree's food which comes from the ground.

Trees eat and drink through the leaves and the rootlets. While they breathe all the time, day and night, rain or shine, as steadily as we do, they feed only part of the time. They sleep in the night, during rainy weather and throughout the winter. The growing season is very short, ending by midsummer. The summer drouths cut off or diminish the supply of water. The leaves are battered and eaten by insects.

A long period of rest is essential that twigs may harden and the wood ripen. Careful preparation for winter takes the place of further thickening of the trunk or lengthening of the limbs. The twigs and stems and roots must be stocked with food. The tree strives to take in all the nutritious parts of each leaf before it casts it off. When winter comes it generally finds the tree ready. The lenticels are sealed during the winter to prevent the breathing away of the tree's moisture.

Each leaf is a laboratory, where minerals and gases, water and sunshine are made into nourishment for the living tissue, from which comes wood, cork, flower, fruit, and a large number of gums, oils, essences.

and perfumes, which have become indispensable in art, manufacture, and medicine.

The leaves take charge of the nourishment of the tree as soon as they open. They prepare food only in the day time and in the presence of the sunlight; the more warmth the more work. They make a complex substance known as starch, containing carbon, oxygen, and hydrogen. The tree finds its growing season inaugurated when it is supplied with foliage. Each leaf is a builder. A large sugar maple is estimated to have 432,000 leaves, presenting to the sunlight an area of half an acre.

The closing of the leaflets at night reduces evaporation, which is a cooling process, and enables the tree to save much of its heat. The cause of the brilliant foliage in the autumn is the chemical decomposition of the useless mineral substance in the leaves when the living substance is withdrawn. No two of the untold millions of leaves in the forest are exactly alike.

The wood of the tree is not alive, neither is the bark. But between the bark and the wood is a peculiar cellular substance known as cambium, which is the living part of the tree, from which new tissues are developed. This ministry, by the leaves, is what lengthens the branches and roots and adds to the tree's diameter. The upward mounting of the sap remains one of the unexplored mysteries of plant life. If a tree is girdled it usually dies because the descending sap can not reach the roots, which soon perish of starvation from lack of food sent them by the leaves.

A tree does not die of old age. It accumulates infirmities with the years and has many diseases. It may starve or die of thirst; caterpillars may eat its foliage, scale bugs suck its juices, beetles tunnel under the bark, scab, rust, moulds, rot, blight, may prey upon it. The wind is also an enemy. Peeling the bark of the birch does not kill it. The lumbering season is over when the sap begins to stream upward, as wood cut "in the sap" is liable to decay. A sugar maple in three weeks yields of its life blood to the extent of twenty-five gallons (seventy drops falling every minute), which boils down to a little less than five pounds of sugar. The trees are not injured if properly treated, but exhausted by being bored too much or at the wrong time.

VALUE OF FRUIT AS FOOD.

Written for Green's Fruit Grower by Robert Sparks Walker.

This is both a scientific and practical subject. It is one that deserves careful consideration. Every one should know just how much of the various constituents of food that fruit contains. The various constituents of foods are grouped under four heads. They are: Carbohydrates, fat, protein, and ash.

The human body requires a certain amount of pure water daily. The

average busy man or woman is almost certain to fail to drink it in sufficient quantities. Just what amount is necessary varies with each individual according to their occupation. The average, however, lies between four and five pints daily. It is a splendid rule to be a little "systematic" in this respect, and ascertain daily if we are providing the body with the proper amount of pure water, that each function of the body may do its work properly, to keep us in good health. Usually two ordinary drinking glasses will equal one pint of water. Then how easy it is for us to calculate the amount of pure water taken into the stomach daily. Some one will ask, but what does water have to do with the subject now under discussion? We must remember that the greater portion of all fruits is pure water. Those who find it difficult then, to drink a sufficient amount of pure water daily, can make up the shortage by eating ripe fruit. Eating fruit is a most excellent way to provide pure water for the system.

But fruit contains something more than water.

It contains protein, and the various other food constituents mentioned above. The protein furnishes the material for making blood, etc. The ash is the mineral portion, or that which would remain if the food was burned. Carbohydrates are the starches, sugars, etc. We all know what fat is, and the purpose it serves in the body.

Having these four constituents under consideration, it is interesting to take up the various kinds of fruits, vegetables and nuts and ascertain the proportionate amount of these food elements each contains. The following is the composition of food materials of the various fruits and nuts:

Grapes, edible part—Water, 77.4; protein, 1.3; ash, 0.5 ;fat, 0.2; carbohydrates, 19.2.

Grape juice, unfermented—Water, 92.2; protein, 0.2; ash, 0.2; carbohydrates, 7.4.

Raisins—Water, 14.6; protein, 2.6; fat, 3.3; carbohydrates, 76.1; ash, 3.4.

Canned fruit—Water, 77.2; protein, 1.1; fat, 0.1; carbohydrates, 21.1; ash, 0.5.

Fruit jelly—Water, 21.0; carbohydrates, 78.3; ash, 0.7.

Apple—Water, 84.6; protein, 0.4; ash, 0.3; carbohydrates, 14.2.

Strawberry—Water, 90.4; protein, 1.0; fat, 0.6; carbohydrates, 7.4; ash, 0.6.

Dried fig—Water, 18.8; protein, 4.3; fat, 0.3; carbohydrates, 74.2; ash, 2.4.

Banana—Water, 75.3; carbohydrates, 22.0; protein, 1.3; fat, 0.6; ash, 0.8.

Potato—Water, 78.3; protein, 2.2; fat, 0.1; ash, 1.0; carbohydrates, 18.4.

Onion—Water, 87.6; fat, 0.3; protein, 1.6; carbohydrates, 9.9; ash, 0.6.

Parsnip—Water, 83.0; protein, 1.6; fat, 0.5; carbohydrates, 13.5; ash, 1.4.

- Celery—Water, 94.5; protein, 1.1; carbohydrates, 3.4; ash, 1.0.
- Green corn—Water, 75.4; protein, 3.1; carbohydrates, 19.7; ash, 0.7; fat, 1.1.
- String beans—Water, 89.2; carbohydrates, 7.4; ash, 0.8; fat, 0.3; protein, 2.3.
- Dry navy beans—Water, 12.6; protein, 22.5; carbohydrates, 59.6; fat, 1.8; ash, 3.5.
- Shelled beans, fresh—Water, 58.9; fat, 0.6; protein, 9.4; carbohydrates, 29.1; ash, 2.0.
- Walnut—Water, 2.5; protein, 16.6; carbohydrates, 16.1; fat, 63.4; ash, 1.4.
- Peanut—Water, 9.2; carbohydrates, 22.4; protein, 25.8; fat, 38.6; ash, 2.0.
- Chestnut—Water, 5.9; fat, 7.0; protein, 10.7; carbohydrates, 74.2; ash, 2.2.
- Peanut butter—Water, 2.1; protein, 29.3; carbohydrates, 17.1; fat, 46.5; ash, 5.0.
- Cocoanut, desiccated—Water, 3.5; protein, 6.3; carbohydrates, 31.5; fat 57.4; ash, 3.1.

WHAT FOOD DOES IN THE BODY.

Protein is that part which is utilized for building up tissues. Fat is a concentrated form of heat; serves to yield heat and is stored as fat.

Carbohydrates are the sugars, starches, etc., but are transformed into fat that yields muscular power, etc. Mineral matter or ash forms bones, assists digestion, etc.

A balanced ration is one that contains the above mentioned constituents in proper portions.

Good farmers today, and expert stock feeders, feed their stock, usually in weight, a well-balanced ration. We are not benefited by the quantity of food taken into the stomach, but according to the amount assimilated. Is it any wonder at the present time that we have so many premature deaths, when people will fill their stomachs with iced foods, sweets, and other delicacies just to gratify a growing appetite, which is certain to become abnormal and which brings on stomach trouble and other human ills? When we begin to study these things, govern our appetite, be reasonable with ourselves, and practice temperance in eating as well as drinking, then we can hope to become a healthy nation.

Unripe fruit is unfit for food. Fruit that has been picked before allowing to ripen on the vine or tree is always inferior, and should be used with the exercise of great care. The department of agriculture has recently decided that oranges which have been picked before they are allowed to ripen, and then later placed on the markets is a violation of the pure food laws. There are a number of fruits picked green, such as cantaloupes, bananas, tomatoes in order that they can be shipped without any loss to the grower.

Bananas are unfit for food unless the flesh is very soft, brittle

and sweet. As a general rule, the bananas kept by all grocery stores are sold before they are fit for food. It is pre-eminently detrimental to one's health to eat such food, and they should be avoided. The best bananas are covered with black spots, and these are the ones that should be eaten. They are the ones that we usually find sold in the larger cities by street peddlers.

Suppose you examine a section of apple, banana, orange, peach, berry, or any good ripe fruit under the microscope. You will certainly want to do something to increase the appetite. No other food shows up so well, and looks so wholesome. It is the food put up by Nature, wrapped in a peel protector that insures wholesomeness, provided we have allowed it to ripen. It should be eaten with every meal and during the day in liberal quantities. There is nothing to take its place. Many of us would have better health and a better disposition if we would eat more ripe fruit each day.

There are no germs or eggs of such dreadful things as tapeworms lodged in pure ripe fruit. If we would eat the proper amount of ripe fruit, the consumption would be more than doubled. In so doing, too, we would increase the great fruit industry in this country to more than double the present production.

NUTS.

The body requires a certain amount of fat. This can be furnished either through the eating of the flesh of animals or through the eating of nuts. You have noticed how difficult it is to eat fat alone—just pure fat? Nature teaches us that this way of eating is wrong, hence it is repulsive to us. Then when Nature stored fats in nuts she mixed it with other constituents to make fat pleasant to the taste. In like manner, when the boy eats his butter, he wants it spread out on the bread so that it will be palatable.

Fruits and nuts should receive serious consideration as every-day articles of food. Let us talk their importance to our neighbors and thus help educate the masses as to their value as food and as health-producers.

COOPERATION AMONG FRUIT GROWERS.

Developing methods of production and distribution of agricultural products along purely economic lines is of comparatively recent origin, more attention having been given possibly to the side of production, says Experiment Station Work. However important it may be to be able to grow crops in large quantities or of particular qualities at a minimum cost, it is equally important to be able to dispose of them in the most economical way and to the best possible advantage, for frequently the easiest and largest profits in any business are those made through methods of handling, marketing, and distribution; and it is here that judgment, based upon economic principles, must be exercised and careful dealing resorted to if the highest returns are to be realized.

Selling through cooperative associations, which is more largely practiced by the fruit growers of the West than any other section of the United States, has proven successful just in proportion as the members have followed the rules, regulations, and instructions of such associations, which in many cases has been done with very gratifying results. In addition to returning profits to the producer, which formerly went to a number of middlemen, cooperation has taught the grower the economic value of a first-class product; the economic importance of picking, packing, and handling his produce; and fair dealing with the purchaser and public.

From the reports of a number of successful associations submitted to the station it is shown that cooperation enables growers to make use of a number of better business methods: (1) By enabling them, through their manager or representative, to meet on equal terms the men with whom they deal. Their representative, thoroughly understanding the markets, "with all the growers and a good pack behind him, controls a business that demands respect, and he should generally be able to set the price." It must be remembered, however, that cooperation is not for the purpose of creating a monopoly or forcing unnatural prices for the product. (2) It frequently brings about or forces track selling, which in the opinion of some brings better results than consigning, one association reporting that for 272 cars consigned it received an average of \$1 per crate and for 288 cars sold on track \$1.66 per crate. (3) Wholesale dealing is made possible, not only in selling farm products but in buying anything the grower needs, especially packing material, spraying materials, fertilizers, and the like. (4) Because of the large business it controls the association is likely to get better service from the railroads, cold-storage plants, etc. "Then it is in a position to secure adjustments with the railroads and other large concerns on points of disagreement, when the cost of litigation would make such adjustments impossible with the small grower." (5) Men of better business ability than the average grower can be secured to manage the association, which means much in the economic disposition of a fruit crop or most any other crop, for many of the best growers, who understand their trees and the methods of care the best, are not the best adapted to deal with men and markets and market conditions.

Cooperation further enables growers to make use of fruits grown in small quantities, which are often wasted because no man has enough to sell to advantage. With cooperation a car could often be loaded and the fruit used to some advantage to each grower, carload lots being considered the economic unit of shipment. It secures better equipment for handling a crop in a section, as disorganized sections are less likely to have the necessary cold storage, precooling, and other equipment for the best handling of a fruit crop. In addition to the benefits of cooperation already mentioned, Mr. Chandler notes the following: (1) The crop may be distributed so as to prevent gluts in the market; (2) it enables the growers to establish a brand that will be known in the

markets and will thus insure better prices; (3) it insures better care of the orchards; and (4) in nearly all cases it results in greater stability of the industry.

Among the difficulties in the way of cooperation are:

(1) The fact that independent growers who do not help support the association get many of the benefits received by the members without paying for them. This will be evident when it is considered that one of the greatest functions of cooperation is proper distribution; and if the association keeps fruit, for example, out of the way, there is little danger of the independent grower's fruit going into a glutted market; consequently he will get nearly as good, if not as good, prices as members. This being true, independent growers will be slow to join the association, and members seeing independents doing as well as they, without having to pay their share toward the support of the association, may tend to drop out.

(2) The difficulty of keeping the quality of the goods handled by the association as high as the quality of goods that would be handled by the best growers working independently.

(3) Crop failures that get the association out of working order on off years.

(4) A spirit of envy and lack of confidence and support of the managers by the members.

Another impediment in the growth of cooperation which might have been noted is the difficulty of securing funds to finance the production and marketing of the crop in the way prescribed by the association. However, it is possible to meet this difficulty by carrying the principle of cooperation a step further and securing loans through a system of cooperative credit, which has done much for European farmers toward solving economic problems of the farm and community. Mr. Charles Douglas, of Scotland, as quoted in a bulletin of the Missouri stations, says:

The greatest practical obstacle in the way of agricultural organization is generally the difficulty of finance. A very large number of those who might benefit most by cooperation are prevented from taking advantage of it because they deal on long credit with the merchants who supply them. It is this fact which has chiefly led to the development of cooperative credit as an essential adjunct to cooperative purchase. * * *

The fundamental idea of the Raffeisen banks, which are the general model for cooperative credit in agriculture, is that the farmers in a small area should combine to find credit for one another. They provide loans for approved reproductive purposes; and the banks rely for their success on the knowledge which their members and managers have of local circumstances and of the character of the applicants, as well as on the fact that each member, being implicated with every transaction, has an interest in seeing that loans are only made for suitable purposes and to reliable persons. It is an interesting corroboration of the soundness of this principle that these banks do not in practice have any bad debts. Both in Germany and in Italy the banks are closely associated

with purchasing societies, so that the borrower has the advantage not only of credit on reasonable terms, but also of cooperative purchase and of the advice and guidance of those by whom the loan is sanctioned.

Regarding the secondary results brought about by cooperative action, it may be said that they are several in number and decidedly far-reaching in their effects. Increased crops and increased prices spell, of course, larger incomes and larger profits, the influence of which stimulates and revives rural life on its social no less than on its economic side. Public schools, country churches, other public institutions and general rural life are apparently made better, all of which tends to check the drift of rural population to towns and cities.—From Green's Fruit Grower.

FRUIT AND FRUIT GROWING: ITS EFFECTS ON MIND AND MORALS.

By Dr. Granville Lowther, Editor Fancy Fruit, North Yakima, Wash.

The many branches of science teach that the process of nature is from lower to higher forms. In the last analysis of material substances, the multifarious forms of life can be traced to only one form, viz., protoplasm. From this one substance all forms have sprung, and the many species of vegetable and animal life have grown. The explanation seems to be that there is an omnipresent energy that struggles for expression, and that the form of expression depends on the environment. For instance, web-footed animals were not made for the water; the water produced the web-footed animals. That is, only the web-footed could survive on a watery surface. The others could not swim, would therefore die and their kind become extinct, while those with web feet would float on the surface, gather their food, live and reproduce their kind. In this way a species was established that tends to permanency.

For land animals, the web foot is an encumbrance, and when they are attacked by their enemies, they save themselves by flying into the water or upward into the air.

Some trees are annuals in a northern climate and perennials in the south. The bear, the rabbit and other animals incline to be white in the polar regions and brown or black in the tropic. In like manner, the races of men differ in color, size, form and mental characteristics growing out of conditions of soil, climate, occupations, modes of life, and whatever tends to modify the mind or body.

THE MAKING OF DISTINCTIVE TYPES.

Even in America, where we are among the youngest of the nations, there are strong tendencies toward distinctive types. For instance, it was proven during the war of the rebellion, in measuring recruits for the army, that the men from the manufacturing districts of New England were smaller of stature than men from the farms. It was shown that men from the mountain regions of Virginia, Kentucky, and Tennessee

were larger than men from other farming districts. These conditions developed mental characteristics as well as physical. The slave owner tended to become an autocrat whose will was law, and who, like Julius Caesar, when asked for a reason for his conduct, said, "My reason is in my will."

The tendency of the New England type was not to subdue men and enslave them, but to conquer the forces of nature and harness them for the work of life. They therefore tended more to science, invention, and mechanics.

The whites who occupied the mountain regions of the South were unlike either. They occupied land where much labor was necessary to produce a meager subsistence; where the accumulation of wealth was impossible; where a large area was necessary for even a sparse population; where even the bare necessities of life were difficult to obtain; where the wage worker was in competition with the slave. Under such conditions there could be no schools, churches, libraries, music or art except the cheapest and most primitive kinds, and the result is the type called "the poor white trash." Under the new order this type is being gradually changed and the traditional Arkansas traveler and the Arkansas hog are passing, and a new Arkansas is being born and is destined to astonish the world.

LIFE OF MODIFICATIONS.

Everything that enters into our lives tends to modify them. The average farmer is a drudge, and, living as he does, he can not be other than he is. His wife is a slave to a farm program that makes her prematurely old or perhaps brings her to a premature grave. There is little of social pleasure and little time for reading, recreation, and music. The children obtain glimpses of city life, have visions of society, wealth, fame, and are restless with the slow plodding and continuous grind of farm life. They leave for the city, to discover later that much they saw was a mirage, deceptive and alluring, but nevertheless fascinating to a soul hungry for society, as a body is thirsty for water. Yet those who live in this social atmosphere are abnormally developed. They are nervous and irritable. They live on abnormal stimulants, either mental or physical. They live without labor on the labor of others. They spend lavishly what they do not earn. They have never learned lessons of industry or economy. They know not the value of time or money. They are as much underworked as the average farmer's family is overworked. Neither of these extremes is desirable.

ORCHARD LIFE A MEDIUM.

It now seems that the orchards of the Northwest will furnish new conditions and build a new type of civilization. They will produce enough so that there will be considerable accumulation of wealth. This will enable the farmer to have good horses, good buggies or automobiles, good roads, good schools, good churches, books, furniture, pictures, music

and the arts of refinement. It will enable him to hire help so that the members of his family are not drudges, but have time for social pleasures at the same time that they are not given up to society as an end of life. He is not isolated as are the growers of grain or stock. Five acres of orchard will produce as much wealth as 160 acres of corn. This means that 32 families of fruit growers can live and prosper on the same area as one family of corn growers. This makes a dense population possible.

A dense population, living in comfort, but not in the luxury of unearned wealth; with money in the bank, with modern conveniences about the premises, is a new type. They will have music, books, pictures, and entertainments that equal those of the inhabitants of the city. In fact, they are within easy reach of the city and attend the same entertainments. They belong to the musical clubs, literary societies, and social sets that meet in the city. Yet they are not wholly given over to society. They live for a purpose; they are up in the morning, breathing the aroma of the flowers, inhaling the pure fresh air, hearing the hum of the bees, the song of the birds and developing physical strength by physical exercise.

The old type of farmer was also up in the morning; in fact, he was up earlier than our modern farmer, so early that no member of his family had sleep enough, but dragged themselves from their beds, sluggish and dull, to perform the long tasks of the long day of drudgery, unbroken by reading or amusement. The result was that his children left the farm in disgust as soon as they reached their majority, if not before. Under the old conditions, it was not possible to live on the farm and be in touch with the intellectual and social conditions of city life.

Now the new farmer has rural free delivery of mails, telephones, in many cases interurban car lines and easy access to all that the city affords.

MONEY NECESSARY.

Senator Elkins said in an address not long since, that "Money is an order on the world for what you want." Very well, then we educate our children and education creates wants. We must have money to supply these wants or there is discontent. To the average farmer, the net income from the farm is not enough to supply the wants of an educated population. This is true in New England and most of the eastern states. We have heard people deplore the influx of ignorant foreigners to America, but if these ignorant foreigners with the simple tastes and habits of the peasant life of Europe did not occupy these farms they would be left unoccupied, for educated Americans will not do it. A New York farmer expressed it as follows: "The trusts fix the prices on everything we buy and everything we sell. The labor unions fix the prices of labor. I can not afford to pay the prices demanded by labor and take the prices for products fixed by the trusts. Therefore, I let my land lie idle rather than run it at a loss." A peasant farmer of Europe could run it, make a living for himself and a little something for the owner. But in the fruit growing regions of the Northwest, nature yields so abundantly in

proportion to the labor bestowed, and the profits are so large, that the farmer can pay the price of labor, pay tribute to the trusts so that they can build up millions of capital, and have enough left to live in comfort; have all the modern conveniences, send his children to college, meet the demands of an educated family, be independent and happy.

HOW TO MAKE FARMERS HAPPY.

President Roosevelt inquires:

"How can life on a farm be kept on the highest level, and where it is not already on that level, be so improved, dignified and brightened as to awaken and keep alive the pride and loyalty of the farmer's boys and girls, of the farmer's wife, and of the farmer himself? How can a compelling desire to live on the farm be aroused in the children that are born on the farm? All these questions are of vital importance not only to the farmer, but to the whole nation."

A NEW TYPE.

In the regions of orchard farming the young people work, but their work brings remunerative returns. They feel the dignity of their positions because they take their places among the educated, cultivated and wealthy of the country. No class of people are making more money than they, none more healthy and pure; none more independent; none who are prouder of their positions; and yet they perform physical labor and are dignified by it. We know girls who pick fruit, assort, pack and perform many of the lighter tasks of orchard work, yet they can sing, play, recite, talk intelligently, are educated and appear in the society of educated people with as much ease and grace as the city girl. But they do so with rosy cheeks, good health, strong bodies and a sense of self-reliance the girl pampered, petted, coddled, and spoiled in the hot-house of city life never knew.

We are developing a new civilization, destined to play an important part in the disputes and class struggles of the near future.

THE BEST ORCHARDIST.

The best orchardist will be a student of the forces and substances with which he has to work. He will know the soil, and that leads him to a study of geology and the chemistry of soils. He will know the laws of plant life, and that leads him to a study of botany. He will know the insect pests, and that leads him to a study of entomology. He will know zoology and biology, for these sciences are intimately related to his work.

In the study of market conditions, he is confronted with the laws of supply and demand, the world's crops, the world's demands, the world's finances, whether labor is employed or unemployed, and therefore has purchasing power, or lacks purchasing power. All these and many other questions determine in a degree the market value of his

crops and gives him a motive for the study of world problems which adds to the general love of study.

He is also confronted with sociological conditions in which there is an effort on the part of all great leaders of industry to eliminate the waste of competition by the organization of trusts; to increase efficiency and build great industrial institutions by the centralization of the capital. He finds these trusts fixing the prices on everything he buys and everything he sells. What does he do? If he is ignorant, he rails at the trusts, curses the railroad companies, fumes, frets, and nurses his acidity of temper until there results chemical changes in the blood, disease germs multiply and break out in boils or some other physical disorder. If he is very ignorant, he doesn't even fret, he simply accepts it; perhaps believing it an order of nature or a dispensation of Providence due to a "weak unworthy worm of the dust" who "can not afford to take the papers and hasn't time to read."

THE FRUIT GROWERS' ORGANIZATION.

If he is wise, he advocates a large fruit growers' organization, big enough to meet successfully other great industrial organizations, as army would meet army, in the military movements of the world. He knows that industrial organizations are an economic necessity and that the industrial class that will not organize will be exploited, despoiled, and robbed by every other. He would meet combines with combines, centralized capital with centralized capital, and extortion with a power strong enough to whip the extortioner.

Many mariners were driven by winds upon the rocks and found watery graves, before it occurred to the survivors to lift their sails, harness the winds, and make them do the work of oarsmen. In like manner, many farmers will be crushed by tribute to trusts before they learn how to utilize the trusts and change from the habits born of individualism to those of collectivism, where they feel that they are not alone, but are one of a class, and the class must struggle together. Later still he will learn that all classes are inter-related and that the good of one is the good of all. The trend of the whole struggle is in the direction of the universal brotherhood of man. The age of military wars is nearing its close. The age of commercial war is approaching its noon. Conditions that compel us to organize as fruit growers, educate, broaden and moralize us. The lesson we must learn or die is cooperation. Cooperation means brotherhood and brotherhood is the essence of morality.

THE WORLD'S LESSON.

The world's military leaders in their lust for power have taught us our first lessons in organization. The great captains of industry in their lust for wealth have taught us a series of lessons belonging in the next higher grade. Labor organizations of wage workers and farmers are defensive. International courts of arbitration will settle international

disputes, and armies and navies will melt away. Industrial commissions will settle the disputes between classes, and the tendency will be toward universal justice.

In the agitations that are inevitable and the discussions that must come, no class is so favorably circumstanced for intelligent, conservative leadership as the horticulturist. He occupies middle ground. He is a worker, but not a wage slave. He is a capitalist without luxury. He is a reader; but not a "book worm." He is a thinker, but not an impractical dreamer whose ideals never crystallize into action. He is alone with nature, but not shut out from the society of men. He mingles in society, but is not controlled by social sets. We are in a strategic position and can be an important factor in shaping the world's destinies if we will.

FRUIT GROWERS' ASSOCIATIONS.

The merchant, the manufacturer and workers in other lines of work see the prime necessity of working together as a unit in their various lines of endeavor. The time is at hand when the fruit growers of Nebraska must get in line and form selling organizations where they can present a united front to their competitors. Nebraska has the soil and climate and men capable of producing as fine fruit as is grown anywhere. This will avail the growers nothing if they can not get good markets. The way to get the best prices and to insure a uniform product is organizations. On the following pages will be found constitutions and by-laws and partial report of the business for the year 1913 of two flourishing associations that are successful. Many communities can form associations and reports of these two associations may be of some benefit to such. For this reason they are placed in the annual report.

REPORT OF EASTERN NEBRASKA FRUIT GROWERS.

By C. G. Marshall, General Manager.

Eastern Nebraska has been recognized as having superior advantages as a fruit growing section, and its products have been steadily gaining in favor for a number of years. Within the past two years apples from orchards having up-to-date management in this section have established themselves on the Chicago and other eastern markets. Buyers have come in and have paid fair prices for this fruit, but, as it has been packed generally in a slipshod method, the more particular buyers and those willing to pay fair prices have brought packers with them and packed the fruit to suit their own markets. When put up in this way this fruit has sold in many cases for three or four times what the grower received for same.

Recognizing the fact that a larger quantity of fruit packed uniformly and bearing a label or brand which would ultimately be recognized on

the best markets of the country, and for which a premium would be paid, the more up-to-date growers got together and organized the Eastern Nebraska Fruit Growers' Association.

The purpose of this organization was to provide ways and means for the cooperation of fruit growers to increase the quantity and quality of fruit products; to engage in and assist in cultivating, pruning, and spraying orchards, fruits, and berry plants; to assist in securing just rates in transportation; to deal in and handle supplies for packing and marketing fruit; to assist its members in securing the best prices on spraying material and other supplies; and to standardize the pack of this territory.

The Association was incorporated the first of September, 1913, and for each membership a share of stock was issued. The capital stock of the association is \$30,000 divided into 1,000 shares.

The organization was perfected in time to handle the apple crop for its members. It is expected to take care of all small fruits hereafter. One of the first requirements for the member in the association is up-to-date orchard and field management. Only growers who spray their trees are eligible.

The following grading and packing rules for apples were adopted by the Association, and all fruit grown by the members of the Association was packed accordingly under the supervision of the General Manager. The head packer or inspector in each orchard was given a number, and each package of fruit packed under his supervision bore this number, making him responsible for the pack.

GRADING AND PACKING RULES.

Quality of Product: The loess soil of this section is peculiarly adapted to the apple. The flavor and keeping quality of apples grown on this soil are conceded by all authorities to be unexcelled, while the abundant sunshine gives it a most attractive appearance. As far back as 1876, at the Centennial Exposition, apples from this section won the Gold Medal on quality, and this high standing is still retained.

Uniform Methods: Standardization of methods, so essential to the buying trade, will be practiced to the fullest extent. All fruit will be packed under grades and rules established by the association and must be passed upon by association inspectors, before the brand is placed on the package which guarantees the pack. This will result in a uniform high class product to be sought after by both the buying trade and the consumer.

Care of Orchards: One of the first requirements for membership in the association is up-to-date orchard management. Only growers who spray thoroughly are eligible. The membership is composed of the very best growers, who practice thorough spraying, pruning, cultivation, and other features of good orchard care.

Varieties: The varieties produced are practically all high class standard sorts. Jonathan and Grimes, standards for quality, are at home in this section and reach the highest state of perfection. Eastern Ne-

braska Winesap can be equaled by but few sections of the United States; and Ben Davis and Gano grown in this section are unexcelled by any other fruit producing section. Other varieties of importance are Duchess, Wealthy, Maiden's Blush, Snow, Black Twig, Rome Beauty, Va. Beauty, York Imperial, and Genet.

Packing: The largest proportion of this fruit will be packed in standard apple barrels. Labels bearing the association brand will be placed on every package of first grade fruit. Stamps or stencils will be used on the second and third grades.

"Association Brand." This grade shall consist of well formed, sound, smooth, apples only; free from all disease, insect and physical injury. Apples must be of natural color and shape, characteristic of the variety. Solid red varieties like Arkansas Black, Gano, Winesap, Jonathan and Missouri Pippin, must have at least 66-2-3 per cent of good natural color. Striped or partially red varieties like Ben Davis, Minkler, Wealthy, and Delicious must have at least 40 per cent of good red color for the variety. All apples except Winesap, Missouri Pippin, Fameuse, Genet, and Red Romanite shall measure $2\frac{1}{2}$ inches in diameter. These varieties may measure down to $2\frac{1}{4}$ inches in diameter. Apples heavily coated with spray or dirt must be cleaned.

"Commercial Grade." Apples in this grade must possess the same physical requirements as to soundness and freedom from disease and decay, as "Association Brand" except that minor defects such as limb rub, spray russeting, and slight deviation from proper form may be accepted. Apples with broken or punctured skin must not be admitted. Solid red varieties must have at least 25 per cent good natural color. Striped or partially red varieties must have at least 20 per cent good natural color. Sizes in this grade shall not run less than $2\frac{1}{4}$ inches in diameter. Slight traces of scab and worms entering calyx end of apple will be permitted in this grade. (Not more than two spots of fungus $\frac{1}{4}$ inch in diameter on any specimen will be permitted.)

"C" Grade. This apple shall be made up of all merchantable apples not included in either of the above grades. All must be free from decay. No apples measuring less than two inches in diameter will be admitted to this grade.

Aside from the fact that the frost did not appear during the blossoming period, the season was the most unfavorable for the production of good fruit in the history of the industry in this section. Considerable cold, damp weather prevailed immediately after the bloom, which favored the development of scab and other fungus. This also hindered thorough spraying, and in many orchards disease gained considerable foothold. Following this period was a season of the highest temperature and one of the lowest precipitation on record. In the apple section of Nebraska there were more than forty days when the thermometer registered above 100 degrees. Excepting a few light, scattering showers, no rain fell from late in June until about the tenth of September. As a result the crop was more than cut in half from what the early prospects indicated. Many trees in orchards not having the best of

care were killed. It was a very trying season for the growers, and especially so for a new organization of fruit growers.

In spite of this, the Association has been counted a success by its members, and they feel just as enthusiastic as ever regarding its future and its benefits to the individuals and the fruit-growing industry of Eastern Nebraska.

The packed fruit was sold to two fruit houses, one in Chicago and one in this state. The two first grades were placed in storage by the buyers in Lincoln, South Omaha, and Chicago. The bulk fruit was sold mainly in Nebraska; some of it went into Kansas, Missouri, Iowa, and south Dakota.

CONSTITUTION AND BY-LAWS FOR THE EASTERN NEBRASKA FRUIT GROWERS' ASSOCIATION.

Adopted at Auburn, Nebraska, March 5, 1913.

OFFICERS.

President, E. M. Pollard.....	Nehawka, Neb.
Vice-President, E. F. Beck.....	Peru, Neb.
Secretary, Val Keyser	Fairbury, Neb.
Treasurer, A. M. Shubert.....	Shubert, Neb.
Directors—	
G. A. Marshall.....	Arlington, Neb.
G. E. N. Sanders.....	Brownville, Neb.
G. S. Christy	Johnson, Neb.
General Manager, C. G. Marshall.....	Nebraska City, Neb.

Offices and Assembling Storage,
Nebraska City, Neb.

CONSTITUTION

Article 1.

Section 1. The name of this association shall be the Eastern Nebraska Fruit Growers' Association. Its principal place of business shall be in the city of Nebraska City, county of Otoe, state of Nebraska.

Article 2.

Section 1. The objects for which this association is formed are to provide ways and means for the growers of fruit in Eastern Nebraska, by cooperation among themselves, to encourage cultivating, pruning, and spraying their orchards, vineyards, and berry plants; to secure from the railroads equitable freight rates; to lease, own, or buy real estate, to sell, mortgage, or otherwise dispose of the same; to construct, buy, or lease sales houses, cold storage plants, or packing houses; to provide proper facilities for supplying sufficient labor to cultivate and harvest the crop of its members; to contract for purchase of packages; to provide for the

purchase of all materials for use of members of association; and to provide proper facilities for the marketing and sale of the fruit grown by its members.

Article 3.

Section 1. The life of this association shall be twenty-five years.

Article 4.

Section 1. The elective officers of this association shall consist of seven (7) directors.

Article 5.

Section 1. The officers and directors of this association are hereby authorized and directed to incorporate this association under the laws of the state of Nebraska when fifty (50) shares of stock shall have been subscribed and fully paid, with a capital stock of \$30,000, said stock to be divided into 1,000 shares of \$30 each. The board of directors may, at their discretion, make provisions to allow not more than three persons to secure one share of stock. In such instance each party shall represent but the proportionate share of the stock he holds. Said stock shall be non-assessable by the corporation.

Article 6.

Section 1. The board of directors shall elect from among their members a president and vice-president. They shall also choose a secretary, a treasurer, and general manager. The board of directors shall have entire charge of the business activities of the association as hereinafter provided in the by-laws.

Sec. 2. Membership in this association shall be confined to actual growers of fruit, as provided in the by-laws.

Sec. 3. The annual meetings of this association for the election of officers shall be on the first Thursday of April of each year. The fiscal year for this association shall run from April 1st to April 1st of each year.

Sec. 4. A quorum to transact business shall consist of a majority of all members of the association. Any stockholder shall have the right to vote by proxy, but no stockholder shall vote by proxy a greater number of shares than he shall own in his own right. Each stockholder shall be entitled to as many votes as he holds shares of stock in the association, provided, however, that one stockholder shall not be entitled to over five shares of stock.

Sec. 5. This constitution may be amended by a two-thirds vote of the stockholders at any annual meeting, or at a special meeting called for that purpose.

BY-LAWS.

Article 1.

Section 1. The board of directors provided for in the constitution shall be elected by the stockholders of the association at its annual meeting, and they shall hold their offices for one year or until their successors are elected and qualified.

Sec. 2. All officers and directors except the secretary and treasurer, shall be stockholders in the association. Any vacancies caused by death or otherwise among the officers or the directors shall be filled by the board of directors.

Sec. 3. At the annual meeting of the stockholders the board of directors shall, through the secretary, make a complete and detailed report of all the business transactions of the association for the year preceding.

Article 2.

Section 1. The president shall preside at all meetings of the stockholders and of the board of directors. He shall sign all certificates of stock, all contracts, and other instruments in writing authorized by the board of directors. He shall exercise a general supervision over the business affairs of the association and perform such specific duties as the board of directors may indicate. In all the relations of the board of directors with the general manager or other officers, inspectors, agents, and employees he shall be the spokesman of the board. Whenever requested to do so by a majority of the board of directors, by the request of twenty-five stockholders, or when in his judgment it is advisable to do so, he shall call a special meeting of the stockholders or of the board of directors.

Sec. 2. In the absence of the president the vice-president shall perform the duties appertaining to that office.

Sec. 3. The duties of the secretary shall be to keep an accurate record of the meetings of the stockholders and of the board of directors. He shall keep the corporate seal of the Association, be the custodian of all deeds, articles of agreement, and all other valuable instruments in writing belonging to the association. He shall keep all books for the issuance of stock, preserve an accurate record of all transfers of stock and original issues of stock in a box provided for that purpose, countersign all certificates of stock and affix the seal of the association when necessary. By the direction of the president he shall call all meetings of the stockholders and of the directors, sending personal notice of such meeting to each stockholder or director as the case may be. He shall perform such other duties as the president or the board of directors may indicate.

Sec. 4. The regular meetings of the board of directors shall be at the head office of the association on the first Thursday of April, first Thursday of June, July, August, September, October, November, and December. Special meetings may be called at any time or place at the call of the president.

Sec. 5. The board of directors shall, as soon as may be necessary after their election, select a secretary, a treasurer, and a general manager, defining their duties where they are not covered by the constitution or the by-laws. The board of directors is authorized to remove said officers for cause. The board of directors shall appoint such additional agents and other employes as the business of the association may demand except as hereinafter provided, and remove the same for cause. The board of directors shall have full management of all the business activities of the

association. They shall formulate rules and regulations for grading and packing the fruit of the members of the association, establishing brands under which the fruit shall be placed upon the market. They are authorized to remove summarily any agent or other employe who fails to follow the rules under which the fruit is to be packed or graded.

Sec. 6. The board of directors shall receive as compensation, while actually engaged in the service of the association, five dollars (\$5) per day and necessary expenses. They shall fix the salary or compensation of all officers, the general manager, the treasurer, and all inspectors, agents, and other employes. They shall cause to be kept a complete record of the meetings of the stockholders and of the board of directors. They shall require the secretary to keep a detailed account of all the assets and liabilities of the association. They shall supervise all the acts of the secretary, the treasurer, the general manager, and all other agents and employes, and define their respective duties. They shall audit or cause to be audited the books of the treasurer and the general manager at least once each month during the shipping season. In order to safeguard the interests of the association, they shall require the treasurer, the general manager, and such other agents, inspectors, and employes as they may think advisable, to give a good and sufficient bond for the faithful discharge of their respective duties.

Sec. 7. The duties of the treasurer shall be to receive all moneys due or paid to the association and deposit the same as the board of directors may instruct. He shall pay out such sums as follows: All checks for the payment of invoices for fruit shall be countersigned by the general manager and the secretary; all checks for the payment of salaries and other expenses shall be countersigned by the president and the secretary. He shall make an accurate and detailed report of the finances of the association showing its resources and liabilities at the annual meeting of the stockholders. He shall perform such other duties as the board of directors may indicate.

Sec. 8. Subject to the board of directors, the general manager shall have full charge of all the commercial and shipping transactions of the association. He shall appoint a chief inspector and such assistants as may be necessary to properly inspect the packing and grading of the fruit of the association. He may remove said inspectors for cause. He shall receive all payments for the sale of fruit handled by the association and deposit the same with the treasurer. He shall render a true and accurate account-sale to the consignor of each lot of fruit, so far as possible, each day for all settlements received on the day preceding. He shall keep a daily record of the number of packages of fruit passing through his hands and the price received therefor. He shall forward daily to each shipper a receipt for the fruit as it is placed in his hands for disposal, showing the lot number, the number of packages of each variety, and the grade it bears. The first of each month he shall make a report to the board of directors of all sales made for the month previous, the prices received therefor, and the amount still due the members of the association. If

shall be his further duty to advise local agents to whom to ship the fruit in their hands belonging to the members of the association and to notify said agents every morning the prices received for the fruit sold by him the day preceding. He shall also furnish said information to stockholders who are not affiliated with any local association. It shall be his duty to satisfy himself that fruit passing through his hands is properly graded and given the correct brand. He shall refuse the association brand to fruit which in his judgment does not come up to the standard fixed by the board of directors. The books of the general manager shall be open at all times for the examination of the members of the association.

Sec. 9. Subject to the direction of the general manager, the general inspector shall have full charge of the local inspectors, and instruct them in their duties. The local inspectors are responsible to him for the correctness of the grading, packing, and the branding of the fruit. It is his duty to require the grading, packing, and branding to be done in conformity to the rules and regulations agreed upon by the board of directors. He shall report any delinquency or inefficiency on the part of any inspector direct to the general manager. It shall be his further duty to require all local agents and individual stockholders not affiliated with any local association to pack their fruit in packages of standard size. During the shipping season, at the discretion of the board of directors, he shall visit each local agent or individual stockholder not affiliated with any local association at least once each month or oftener if in his judgment it is necessary to do so, or upon the suggestion of the general manager.

Sec. 10. All local inspectors shall be appointed by the general manager. Under the supervision of the chief inspector they shall inspect all fruit packed by local agents or individual stockholders not affiliated with any local association, and attach or cause to be attached the association brand, and the grower's and packer's number, on all fruit graded and packed according to the rules formulated by the board of directors. They are authorized to refuse the association brand to any fruit not up to said standard. They shall report the names of any packer or packers who are inefficient, careless, or undependable to the local agent. If said local agent does not require said packer or packers to grade and pack the fruit properly, he may refuse to receive all fruit packed by said packers on the account of the association.

Sec. 11. Before any fruit grower may become a member of this association he shall make application to the secretary of this association. Said application must be accompanied with a draft for the purchase of at least one share of stock, and said application must be approved by the board of directors.

Sec. 12. Whenever ten or more stockholders of the Southeast Nebraska Fruit Growers' Association, representing at least three hundred dollars (\$300) worth of stock in said association, shall desire to organize a local association, they shall first make application to the board of directors to organize an auxiliary to the Eastern Nebraska Fruit Growers' Association. If the board of directors give assent then the said stockholders shall, as soon thereafter as possible, meet and organize by electing

a local board of five directors and an agent. They shall also elect a president and secretary. The secretary of said local division shall immediately notify the secretary of the Eastern Nebraska Fruit Growers' Association of their action, giving the names of its officers, directors, agents, and members; provided, however, that the board of directors of the Eastern Nebraska Fruit Growers' Association may withhold consent to organize a local association whenever in their judgment the stockholders of the proposed association can be served just as well by some other local association.

Sec. 13. The local agents shall have entire charge, under the direction of the general manager, of all shipments of fruits from the local association to which they belong. The stockholders may remove said agent for cause and fill such vacancy. Said local agent shall receive general instructions from the local board; provided, however, said local agent shall receive instructions concerning the grading and packing of the fruit only from the chief inspector or his assistants. Whenever the local agents fail to grade the fruit in compliance with the instruction from said inspector, the chief inspector may suspend said agent, and fill his position temporarily or until the local stockholders shall meet and elect his successor. Local inspectors may be removed by the chief inspector for cause. Said chief inspector shall fill the position so vacated temporarily until filled by the general manager.

Sec. 14. The local board of directors shall have general supervision over all fruit grown by the members of the local association they serve. It shall be their duty also to encourage other fruit growers in their vicinity to become affiliated with the local association and to see that the members of their local association comply with the rules and regulations of the Eastern Nebraska Fruit Growers' Association. Provided, however, that no fruit grower shall be admitted to any local association who shall not have first secured stock in the Eastern Nebraska Fruit Growers' Association. Said local directors may, when in their judgment the best interests of their association warrant, purchase all cooperage, packing boxes, and crates for the use of the members of the local association.

Sec. 15. No local agent or inspector shall buy for shipment or sale any fruit from members of this association. Satisfactory proof of such practices shall be sufficient cause for their removal. Neither shall they receive or buy fruit from any grower or other person who is not a member of this association, under penalty of removal.

Sec. 16. The Eastern Nebraska Fruit Growers' Association shall sell on track all fruit grown by its members; provided, however, that when it is not practicable to sell the fruit they shall either store in cold storage or consign, with the approval of the shipper, the same to commission firms known to be reliable; provided further that each grower shall have the option to sell or store his fruit. It is understood that the Eastern Nebraska Fruit Growers' Association acts in the capacity of agent for the local association or the individual stockholder as the case may be. This association shall prosecute all claims against transportation companies.

refrigerator car companies or express companies, and all other claims of whatsoever character arising from the sale of the fruit of the members of this association. It shall collect all bills passing through its hands and make a detailed report of the same to the owner thereof. When the fruit of two or more stockholders is placed in the same car, each grower shall place his individual mark on each package of his fruit. The general manager shall take note of these mixed shipments and shall make out separate invoices and remittances for the same. For all the aforesaid services rendered to the local associations or individual stockholders the Eastern Nebraska Fruit Growers' Association shall deduct such commission as may be fixed by the board of directors, and forward the balance to the proper parties without delay.

Article 3.

Section 1. The by-laws of this association may be amended at any annual meeting of the stockholders by a majority vote of the stockholders of this association.

Article 4.

Section 1. The names of all packers employed in packing the fruit of the members of this association shall be registered with the secretary of the association who shall furnish the chief inspector and general manager with a list of the same. The secretary shall give each packer a number which shall be registered. He shall furnish each packer with a rubber stamp bearing his number. Each packer shall affix his number to every package of fruit he puts up.

Article 5.

Section 1. All local agents shall report to the general manager of the association May 15, June 1, July 1, August 1, and September 1, the following information: A careful estimate of the number of crates, boxes, or barrels, as the case may be, of the various varieties of fruits that the members of his local association will probably have to ship through the association. All individual stockholders not affiliated with any local association shall submit to the general manager the same carefully prepared estimate.

Article 6.

Section 1. The Eastern Nebraska Fruit Growers' Association shall have the exclusive right to market all the graded fruit, as fixed by the board of directors, grown by its members, provided, however, that any member may have the privilege of selling his fruit in small quantities to his neighbors or friends, and provided further, that any member may sell all or a part of his crop. In such cases he shall be required to pay the association only one-half of the regular commission.

Article 7.

Section 1. All dividends declared by this association shall be issued pro rata to the members of the association, based upon the proceeds arising from the sale of the fruit of each member of this association.

REPORT OF THE OMAHA FRUIT GROWERS' ASSOCIATION.

Omaha, Neb., Nov. 12, 1913.

Mr. J. R. Duncan, Secretary State Horticultural Society, Lincoln, Neb.:

Dear Sir—I am not in a position to give you a detailed statement at this time, but our sales this season will run about \$72,000. It may possibly go over that, as we are still receiving a few apples from some of our growers.

The largest item we grow is Concord grapes, of which we shipped 65 cars this season, in addition to the local sales we made in the open market.

On account of the hot, dry summer, our crop fell far below what we expected. Early estimates of grapes figured we would have nearly 100 cars to ship. The quality was not as good as last year, the hot weather and lack of rain maturing the fruit too quickly, thus reducing the size of the berries and injuring the keeping quality.

This season we marketed 4,500 crates of cherries, 4,400 cases of blackberries, and 4,250 cases of black raspberries. Besides we had a good many strawberries, gooseberries, currants, red raspberries, apples, plums, and some vegetables.

We have realized very satisfactory prices for our products this season which in a measure makes up for the shortage in the crop.

Cooperation is the dominant feature of our Association. At our meetings, if any grower has discovered some improved method of cultivation, or tried out some new variety of fruit which proved to be more productive and of superior quality, which makes it more profitable to grow, this information is given freely to all the members and is discussed in the meeting. Every time we improve the quality and quantity of our products, it is a direct benefit to every member.

The members get all their basket and box material through the Association who make an estimate about the first of the year, and then place their contracts, which are of an elastic nature so they can either be reduced or increased a certain per cent after the crop is advanced enough in the early spring, when a fairly accurate estimate can be formed. By handling it in this manner, very little material is carried over from year to year. This enables the Association to furnish its members with fresh, clean packages every season.

Most of the nursery stock is also bought in the same manner, so that every spring good sized orders are placed with the nurserymen who are in position to make the best price and also furnish the quality, but quality comes first for we are ever striving to improve the fruits of our orchards, and by so doing at all times command the highest market prices.

We also ship in cars of the very best and purest seed potatoes we can get hold of, which cost our growers very little more than the common article.

By this system of cooperation, our growers are furnished with

their supplies at practically wholesale prices, which is quite a saving to each individual during the year.

Our efforts are all directed along commercial lines, studying the demands of the markets, and trying to produce what will bring the highest remuneration from the minimum amount of labor and money invested, so our Board of Directors are ever on the alert for any new or improved nursery stock, improved methods of planting and cultivation, and the proper time and kind of spraying to use. This information is given to members at general meetings, and by this system of education, they are gradually bringing their products to the highest standard.

Yours very truly,
 OMAHA FRUIT GROWERS' ASSOCIATION,
 N. H. Nelson, Manager.

THE OMAHA FRUIT GROWERS' ASSOCIATION.

OFFICERS 1913

Lewis J. Ihm, President.....Benson, Neb.
 George Gould, Vice-President.....Florence, Neb.
 C. Sorensen, Treasurer.....Florence, Neb.
 J. J. Smith, Secretary.....Florence, Neb.
 Directors—

Lewis J. Ihm.....Telephone, Benson 404
 George Gould.....Telephone, Florence 3501
 H. L. Snyder.....Telephone, Florence 3561
 S. B. Letovsky.....Telephone, Florence 5101
 C. Sorensen.....
 A. E. Lewis.....Telephone, Benson 6174
 J. J. Smith.....Telephone, Florence 3502

ARTICLES OF INCORPORATION OF THE OMAHA FRUIT GROWERS' ASSOCIATION.

We, the subscribers to these articles of association, do hereby associate ourselves together, and do hereby organize and form an association under the laws of the State of Nebraska, to be known by the name and title of The Omaha Fruit Growers' Association. The object of this association shall be to enable the members thereof to dispose of their fruits so as to realize the best possible prices, by reducing to a minimum the expense of shipping and marketing the same.

Article I.

The capital stock of this association shall be ten thousand dollars (\$10,000), divided into one thousand (1,000) shares of ten dollars (\$10.00) each, and shall be transferable only on the books of the company.

Article II.

Section 1. This association shall continue to be a body corporate for a period of twenty (20) years, unless sooner dissolved.

Sec. 2. The officers of this association shall be a president, vice-president, secretary, treasurer, and directors, all of whom must be legally qualified electors of this association.

Article III.

Section 1. The board of seven directors shall be elected at the annual meeting to be held on the second Saturday in December in each year. At their first meeting after being elected, the board of directors shall elect the president, vice-president, secretary and treasurer of the association. Only members of the board of directors shall be eligible to the office of president, vice-president and secretary. Officers elected at the organization shall serve until the next annual meeting.

Amendment to Section 1, Article III:

That in electing a new board of directors, that four members shall be elected for a term of two years and three members for a term of one year, and that hereafter the term cover two years.

The four members receiving the highest number of votes shall serve two years, and the three receiving the next lowest number of votes shall serve one year (passed December 11, 1909).

Sec. 2. All directors shall be elected by ballot. Every member holding stock in this association shall have one vote (for every share of stock) in all business meetings of this association. ,

Sec. 3. The board of directors shall employ a business manager on such terms as they, in their judgment, deem best for the general good of all members; said manager must be an experienced fruit man with a thorough knowledge of all markets tributary to Omaha, so as to realize the highest possible prices from the sale of all products.

Sec. 4. Special meetings of the association may be held whenever the board of directors deem it necessary, or on petition of ten members of the association.

Article IV.

Section 1. The president shall preside at all meetings of the association, call special meetings in accordance with Section 4, Article III, and carefully watch over and guard the best interests of the association.

Sec. 2. In the absence of the president, or in case of his inability or refusal to act, the vice-president shall perform the duties of the president.

Sec. 3. The secretary shall keep a record of the proceedings of the association and of the board of directors and shall notify each member of the time and place of holding all meetings. He shall also have in his keeping all documents the property of the association, including the seal, stock books, etc., and keep a correct account of all stock issued, and perform such other duties as may be required of him by the association or board of directors.

Sec. 4. The treasurer shall receive all funds of the association and disburse the same on checks signed by the president and secretary of the association, and he shall pay no bills unless approved by them. He shall execute a good and sufficient bond for the faithful performance of his

duties, the amount of said bond to be determined and the security to be approved by the board of directors.

Sec. 5. The board of directors shall employ all necessary help and fill all vacancies that may occur in the board during the year until the next annual meeting, when they shall be filled by the association. The board of directors, with the manager, shall have entire charge in the management of the business. The board of directors shall meet as often as necessary during the shipping season and shall decide all grievances. They may require the manager to keep them fully posted as to the selling price per package and to whom sold or consigned.

Sec. 6. A majority of the board of directors shall constitute a quorum for the transaction of business.

Sec. 7. Any member of the board absenting himself three times or more from the meetings without good and sufficient cause, his office shall be declared vacant and filled by the board of directors.

Sec. 8. The board of directors shall appoint one or more inspectors, whose duties shall be to examine the crops, confer with the growers so as to prevent the shipping of poor and damaged fruits.

Whenever the quality or packing of any grower falls below the recognized standard of "first quality No. 1," such fruits shall be sold on their merits so as not to jeopardize other growers' fruits being shipped with them.

Article V.

Section 1. Every fruit grower who wishes to become a member of this association shall purchase at least one share of the capital stock, on which he shall pay 50 per cent cash, same to be endorsed on certificate of stock and signed by the president and secretary of the association. Remaining 50 per cent to be paid on call of the board of directors.

Sec. 2. Each member shall mark all fruit with the association trademark, but he shall not use the trademark on fruit sold or shipped outside the association. The shipper's name or member association number shall be stamped plainly on all packages delivered to the association.

Sec. 3. Each member of this association shall co-operate with the board of directors to the end that uniform size packages, together with weight, shall be the rule.

Sec. 4. Any member withdrawing from the association shall pay his just indebtedness thereto, and shall forfeit his interests in all benefits and property of this association, except stock held, as liquidated damages to the association for such withdrawing.

Article VI.

Indebtedness of this association shall not exceed two-thirds of the paid up capital.

Article VII.

The directors shall make and endorse such rules and regulations governing themselves and help employed as they shall deem best and necessary for the good of the association.

Article VIII.

These by-laws may be amended by a majority vote at any regular or legally called meeting; providing each amendment shall have been duly read at the last previous meeting of the association.

Article IX.

February 1, 1908:

Section 1. That in future when any member has a complaint regarding the handling of his fruit by the manager, that the same be made in writing to the secretary, who will bring the matter before the board of directors.

January 13, 1909:

Sec. 2. Each member of the board shall devote such time to the management of the business of the association as shall be necessary to fully protect the interest of the members and stockholders, and he shall receive as compensation for same such sum, not exceeding \$2.00 per meeting, but said compensation shall not exceed twenty-four dollars (\$24.00) for the whole year.

January 13, 1909:

Sec. 3. That the salary of the secretary shall not exceed two hundred dollars (\$200.00) per year, exclusive of postage and stationery.

January 13, 1909:

Sec. 4. It shall be compulsory on the part of each member of this association to turn over to the manager such fruits as are being handled by him, on arrival at the market, it being understood that this does not prohibit any member from selling to customers while in transit to market, but does prohibit them from selling any fruit after arrival at the market, and that the board of directors be authorized to provide suitable penalty for a violation of the rule.

BY-LAWS.

Adopted unanimously January 28, 1911.

Preamble. Whereas, The members of this association are all actively engaged in fruit raising, and to a large extent the stockholders are also interested in such business; and

Whereas, It is the purpose of the organization to furnish to the members the facilities offered by the association for marketing their crop; and

Whereas, It is absolutely necessary in order to secure the minimum of cost in operating the association that the members should enter into definite agreement with the association with reference to their product and shall bear the expenses of maintaining the association.

Therefore, To the end that the members may secure the best results from the purposes of the organization and the stockholders may be paid fair dividends upon their investment,

Be it resolved, That the following be and hereby are adopted as part of the by-laws of this association.

Article X.

Section 1. The provisions of this article shall in no way affect the stock of this association, but has reference only to the dealings of the members with the association.

Sec. 2. Every member of this association desiring to avail himself of the advantages of this association in the matter of purchases and sales must strictly comply with the provisions hereof, and it is made the duty of the board of directors to enforce its provisions.

Sec. 3. The board of directors shall cause suitable blanks to be prepared, which the members are required to execute, showing the probable amount of fruits to be handled by the association. These blanks properly filled out must be in the hands of the secretary not later than May 1 of each year, to entitle the member to participate in the advantages of the association for that season. The date may be extended at the option of the board of directors. The inspectors employed by the association may be required to assist in carrying out the provisions of this section.

Sec. 4. Every member shall deposit with the treasurer of the association, on or before May 1 of each year, the sum of \$10, which sum, or so much thereof as may be necessary, shall be used by the directors to pay the fixed charges of the association.

Failure to pay the sum aforesaid within the time aforesaid shall bar the member from the privileges of the association for that season.

Sec. 5. Each member electing to participate in the privileges of the association shall deliver all of his fruits (except for personal use) to the association for sale.

Sec. 6. Each member so electing to participate in the privileges of the association shall be charged by the association a commission of 10 per cent based on the gross sales of his entire marketed fruit during the season.

Sec. 7. Any member failing to comply with any of the provisions hereof shall forfeit all rights of membership and forfeit all interest in any moneys remaining from the unused funds arising from membership fees as set forth in section 4, or unused commissions arising from the provisions of section 6.

Sec. 8. The commissions provided for in section 6 shall be used so far as required to pay the expenses of sales manager, inspectors, and other expenses connected with the marketing of the products delivered to the association for sale.

Sec. 9. At the close of the season on or before the annual meeting each year the directors shall cause a distribution of the unused fees and unused commissions to be made as follows:

1. Only such members as have strictly complied with the provisions hereof shall be entitled to participate in such distribution.

2. Members so entitled to participate, and so far as the funds will justify, shall receive a return of moneys so deposited by them and so collected from them by way of commissions on fruits delivered to the association for sale by each member.

3. The balance of unused commissions on sales, if any, so far as the same may not be needed by the association in the discretion of the board of directors, shall be returned to the members in proportion to the amount of their contribution to such fund respectively.

4. The board shall take action in its discretion for the collection of any moneys due the association from members under the provisions of section 6 hereof.

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