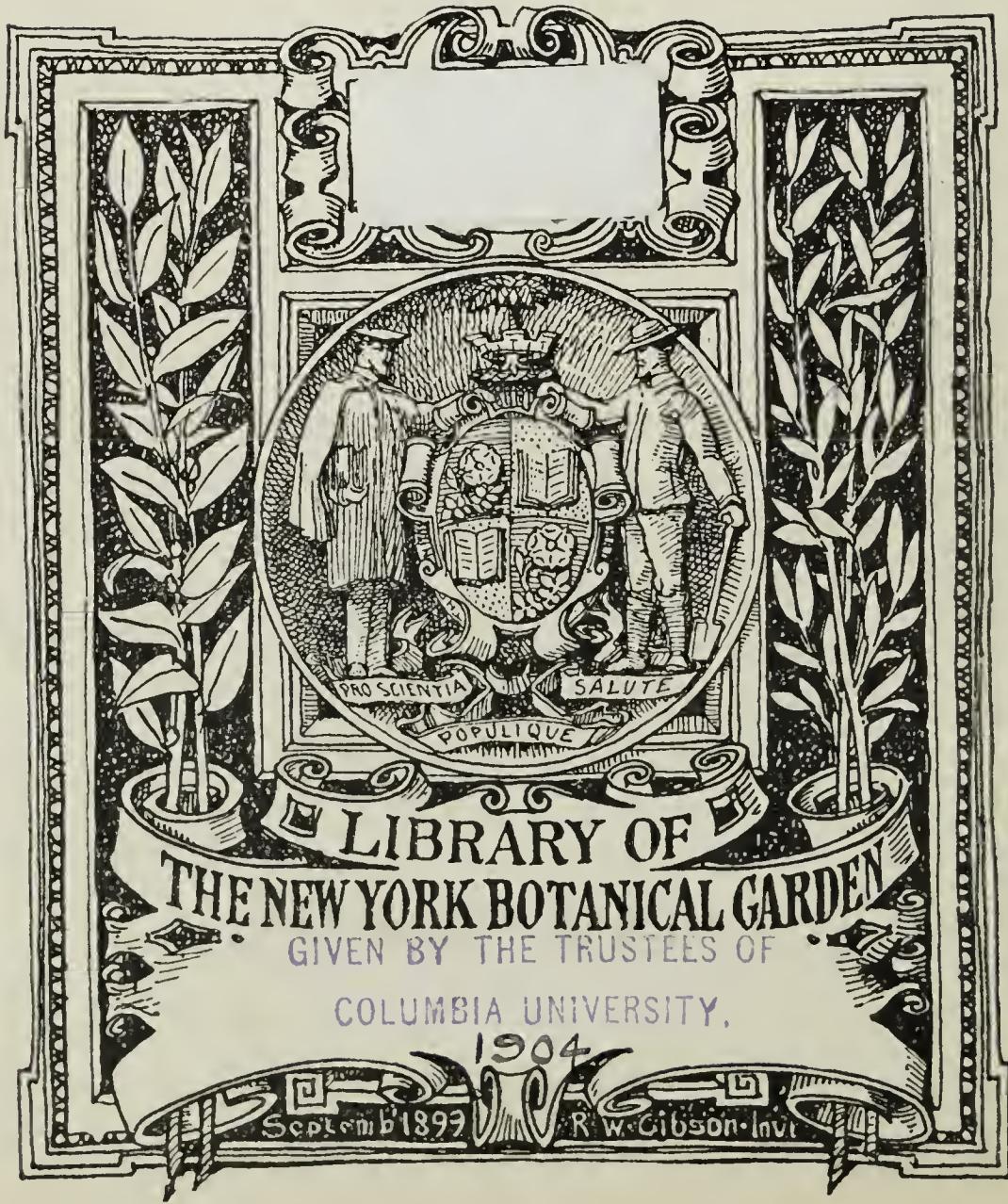


FLORIDA STATE  
HORTICULTURAL SOCIETY.  
SESSION 1894

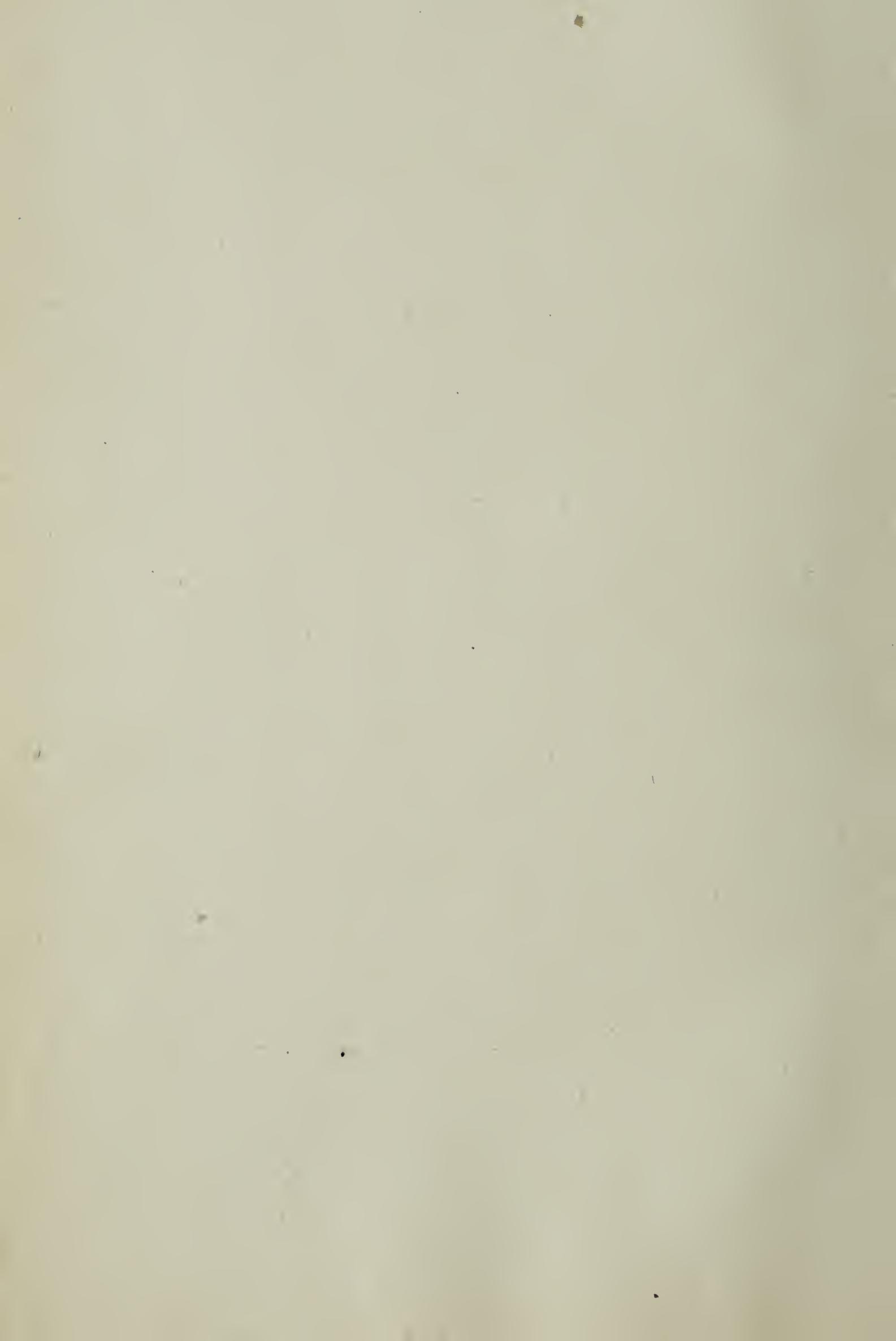
Columbia College  
in the City of New York













Digitized by the Internet Archive  
in 2019 with funding from  
**BHL-SIL-FEDLINK**

LIBRARY  
NEW YORK  
BOTANICAL  
GARDEN

<https://archive.org/details/proceedingsofann7189unse>

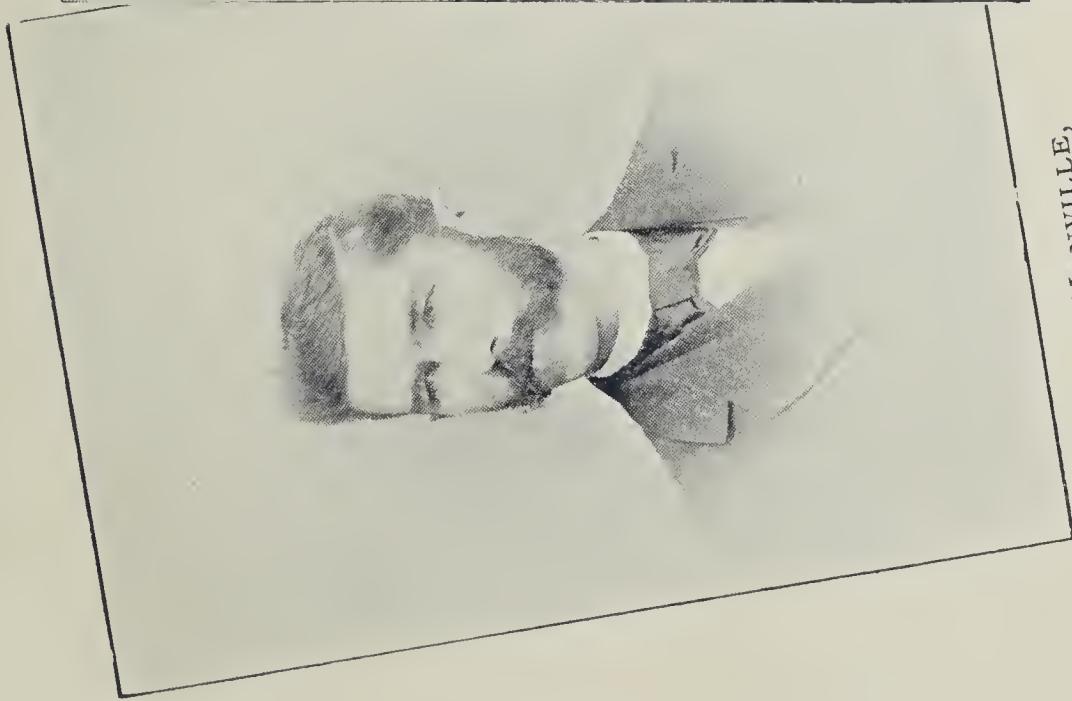


DUDLEY W. ADAMS,  
*President Florida State Horticultural Society.*





A. H. MANVILLE,  
Secretary.



GEORGE L. TABER,  
First Vice-President.



Of the C. F. A. BIELBY,  
*Executive Committee.*





PROCEEDINGS  
OF THE  
SEVENTH ANNUAL MEETING  
OF THE

FLORIDA- STATE -HORTICULTURAL SOCIETY,

HELD AT  
JACKSONVILLE, FLA.,

April 10th, 11th, 12th and 13th, 1894.

---

Compiled by the Secretary.

---

LIBRARY  
NEW YORK  
BOTANICAL  
GARDEN

PUBLISHED BY THE DEPARTMENT OF AGRICULTURE

L. B. Wombwell, Commissioner.

---

TALLAHASSEE, FLA.  
FLORIDIAN PRINTING COMPANY.  
1894.

XP  
R676  
v.7.  
1894

LETTER OF TRANSMITTAL.

FLORIDA STATE HORTICULTURAL SOCIETY,  
SECRETARY'S OFFICE,  
GLEN ST. MARY, Fla., July 24, 1894.

*Hon. L. B. Wombwell, Commissioner of Agriculture for the State of Florida:*

DEAR SIR:—Some time since I had the honor to communicate to you the Executive Committee's acceptance of your very liberal offer to publish the proceedings of the seventh annual meeting of the Florida State Horticultural Society; in conformity thereto I herewith transmit to you the report as compiled for publication. Yours respectfully,

A. H. MANVILLE,  
Secretary.

## CONTENTS.

LIBRARY  
NEW YORK  
BOTANICAL  
GARDEN

|   | PAGE. |
|---|-------|
| Letter of Transmittal .....                               | iv    |
| Constitution .....  | vi    |
| Officers, including Standing and Special Committees ..... | vii   |
| List of Members, Honorary, Life and Annual .....          | x     |
| Prefatory Note .....                                      | xv    |
| Synopsis of Proceedings .....                             | 1     |
| Address of Welcome .....                                  | 5     |
| Response to Address of Welcome .....                      | 6     |
| President's Annual Address .....                          | 9     |
| Reports of the Secretary and the Treasurer .....          | 14    |
| Cataloguing Our Fruits .....                              | 16    |
| Florida and Texas .....                                   | 17    |
| The Introduction of New Fruits and Plants .....           | 23    |
| Grape Growing for Profit .....                            | 25    |
| Marketing Grapes .....                                    | 27    |
| Discussion on Grapes .....                                | 28    |
| Pineapples .....  | 35    |
| The Kaki (Japan Persimmon) .....                          | 40    |
| Peaches and Plums .....                                   | 44    |
| Discussion on Peaches and Plums .....                     | 48    |
| Pears .....   | 52    |
| Strawberries .....  | 57    |
| Varieties of Oranges, and Their Derivation .....          | 59    |
| Results in Crossing Navel Oranges .....                   | 62    |
| Experiments in Crossing Citrus Fruits .....               | 64    |
| Discussion on Citrus Fruits .....                         | 65    |
| Diseases and Insects of Citrus .....                      | 66    |
| Sulphur Solution—Blight—Lemon Scab .....                  | 71    |
| The "White Fly" and "Sooty Mould" .....                   | 74    |
| Discussion on Citrus Insects and Insecticides .....       | 79    |
| Truck Farming .....                                       | 84    |
| Discussion on Vegetables .....                            | 86    |
| The Best Lawn Grass for Florida .....                     | 90    |
| Injurious Insects .....                                   | 94    |
| Discussion on Injurious Insects .....                     | 99    |
| Fertilizing Orange Groves .....                           | 103   |
| Fertilizers and Fertilizing Materials .....               | 104   |
| Discussion on Fertilizers .....                           | 117   |
| Irrigation in Florida .....                               | 130   |
| Marketing Oranges .....                                   | 140   |
| Transportation .....                                      | 143   |
| Place of Next Meeting .....                               | 151   |
| Resolutions of Thanks .....                               | 153   |

FEB 11 1895

New York Botanical Garden

188660

## CONSTITUTION.

---

ARTICLE 1. This organization shall be known as the Florida State Horticultural Society, and its object shall be the advancement of horticulture.

ART. 2. Any person may become a member of the society by signing the constitution and paying one dollar.

ART. 3. Its officers shall consist of a President, three Vice-Presidents, Secretary, Corresponding Secretary, Treasurer, and Executive Committee of three, who shall be elected by ballot at each annual meeting. After the first election their term of office shall begin on the 20th of May following their election.

ART. 4. The regular annual meeting of this society shall be held on the second Tuesday in April, except when otherwise ordered by the Executive Committee.

ART. 5. The duties of the President, Vice President, Secretary and Treasurer shall be such as usually devolve on those officers. The President and Secretary shall be, *ex-officio*, advisory members of the Executive Committee.

ART. 6. The Executive Committee shall have authority to act for the society between annual meetings.

ART. 7. The Constitution may be amended by a vote of two thirds of the members present.

---

FIRST AMENDMENT.—Section 2, Article 2. Anyone may become a life member of this organization by the payment of the sum of ten dollars to the society.

---

“The annual dues of members shall be one dollar.”

## OFFICERS

OF THE

## Florida State Horticultural Society,

1894-95.

---

**PRESIDENT.**DUDLEY W. ADAMS, Tangerine.

---

**VICE-PRESIDENTS.**G. L. TABER, Glen St. Mary.      G. W. MELLISH, DeFuniak Springs.  
O. P. Rooks, Fruitland Park.

---

**SECRETARY.**A. H. MANVILLE, Glen St. Mary.

---

**CORRESPONDING SECRETARY.**E. O. PAINTER, DeLand.

---

**TREASURER.**J. B. ANDERSON, San Mateo.

---

**EXECUTIVE COMMITTEE.**LYMAN PHELPS, Sanford, Chairman;  
C. F. A. BIELBY, DeLand;                  E. S. HUBBARD, Federal Point.  
President and Secretary, *ex-officio*.

## STANDING COMMITTEES.

---

*Committee on Cataloguing the Fruits of Florida:* A. H. Manville, Glen St. Mary; L. W. Plank, DeFuniak Springs; G. L. Taber, Glen St. Mary; Jas. H. White, Georgiana; R. D. Hoyt, Seven Oaks.

*Committee on the Introduction of New Fruits and Plants:* S. S. Harvey, Molino; W. T. Swingle, Eustis; H. S. Williams, Rock Ledge; G. L. Taber, Glen St. Mary; G. P. Healy, Jaffery.

*Committee on Citrus Fruits:* H. S. Williams, Rock Ledge; A. L. Duncan, Dunedin; W. A. Cooper, Orlando.

*Committee on Grapes:* Emile Dubois, Tallahassee; Frank E. Boncher, Orlando; H. P. Walker, Auburndale.

*Committee on Peaches and Plums:* L. W. Plank, DeFuniak Springs; Edward Winter, Zellwood; Irving Keck, Bowling Green.

*Committee on Pears and Apples:* S. S. Harvey, Molino; S. H. Gaitskill, McIntosh; J. D. Andrews, Glen St. Mary.

*Committee on Figs:* W. D. Griffing, Macclenny; L. H. Armstrong, St. Nicholas; J. A. Moore, Pensacola.

*Committee on Tropical Fruits:* Thomas E. Richards, Eden; O. R. Thatcher, Avon Park; O. K. Wood, Cocoa.

*Committee on Kaki:* F. E. Fuller, Okahumpka; H. F. Stewart, Daytona; A. S. J. McKinney, Stanton.

*Committee on Strawberries and Miscellaneous Fruits:* E. G. Hill, Lawtey; James Mott, Orlando; C. H. Newell, DeFuniak Springs.

*Committee on Native Fruits:* W. H. Mann, Mannville; Young G. Lee, St. Petersburg; A. W. Stewart, Galt.

*Committee on Ornamentals:* Mrs. W. H. H. Holdridge, Grove Park; A. V. Clubbs, Pensacola; Mrs. S. A. Cunningham, Altoona.

*Committee on Nomenclature:* John Fabyan, Conant; E. S. Hubbard, Federal Point.

*Committee on Vegetables*: Geo. H. Wood, Tangerine; W. K. Jackson, Inverness; Albert Fries, St. Nicholas.

*Committee on Entomology*: P. H. Rolfs, Lake City; W. T. Swingle, Eustis; J. F. Stubbs, DeFuniak Springs.

*Committee on Fertilizers*: Stephen Powers, Lawtey; O. P. Rooks, Fruitland Park; Lucius D. Stebbins, Orlando.

*Committee on Irrigation*: Geo. H. Wright, Orlando; Geo. W. Adams, Thonotosassa; H. W. O. Margary, Eustis.

*Committee on Diseases and Insects of Citrus*: H. J. Webber, Eustis; F. G. Sampson, Boardman; C. A. Bacon, Ormond.

*Committee on Marketing*: Thos. Hind, Georgetown; W. S. Hart, Hawks Park; M. W. Bennett, Okahumpka.

*Committee on Transportation*: G. P. Healy, Jaffery; T. A. Darby, San Mateo; W. J. Borden, Oxford.

---

## SPECIAL COMMITTEES.

---

*Committee on Legislative Appropriation*: S. S. Harvey, Molino; G. P. Healy, Jaffery; Emile Dubois, Tallahassee.

*Committee on Joint Session, Texas and Florida State Horticultural Societies*: G. L. Taber, Glen St. Mary; Geo. H. Wright, Orlando; G. W. Mellish, DeFuniak Springs.

*Committee on Investigation of Legislation Designed to Prevent the Introduction of Diseases and Insects*: J. F. Stubbs, DeFuniak Springs; P. H. Rolfs, Lake City; H. J. Webber, Eustis.

## LIST OF MEMBERS.

---

### **Honorary.**

---

Berckmans, P. J., Augusta, Ga., | Redmond, D., St. Nicholas-

### **Life.**

---

Healy, G. P., Jaffery,  
Manville, A. H., Glen St. Mary,  
Hart, W. S., Hawks Park,  
Taber, G. L., Glen St. Mary,  
Painter, E. O., DeLand,  
Harvey, S. S., Molino,

Richards, Thos. E., Eden,-  
Phelps, Lyman, Sanford,  
Gaitskill, S. H., McIntosh,  
Conner, W. E., 532 Madison ave.,  
New York City.  
Bielby, C. F. A., DeLand.

### **Annual.**

---

Adams, Dudley W., Tangerine,  
Anderson, J. B., San Mateo,  
Armstrong, L. H., St. Nicholas,  
Anderson, John, Ormond,  
Adams, C. G., Sorrento,  
Amsden, E. W., Ormond,  
Allen, G. M., Oak Hill,

Bailey, Geo. M., Orlando,  
Batterson, N. D., St. Augustine,  
Bacon, C. A., Ormond,  
Bean, E., Jacksonville,  
Bradford, John, Bradfordville,  
Brown, A. F., San Mateo,  
Bradt, Benj. N., Huntington,

Andrews, J. D., Glen St. Mary,  
Andrews, Mrs. K. A., Glen St. Mary,  
Adams, Geo. W., Thonotosassa,  
Adams, S. C., Ponce de Leon,  
Avery, Dr. A. G., Orlando,  
Allsop, W., Weirsdale.

Bradt, Mrs. Benj. N., Huntington,  
Brown, A. H., Belleview,  
Brown, C. W., Huntington,  
Burgess, J. E., Grove Park,  
Boncher, Frank H., Orlando,  
Bosanquet, Louis, Fruitland Park  
Burr, R. H., Winter Haven,

Bostrom, J. A., Ormond,  
 Bostrom, Charles, Ormond,  
 Blood Edwin, Newburyport Mass  
 Bartlett, Geo. T., San Antonio,  
 Texas,  
 Brooker, Hy. Spencer, Ocoee,  
 Burns, Dennis, Pensacola,  
 Boring, J. W., Citra,  
 Blake, Ellis, Lake Helen,  
 Brady, A., Mims,  
 Burgwin, H. P., Zellwood,  
 Boone, C. A., Orlando,  
 Baker, Chas. Henry, Grasmere,  
 Bitting, A. W., Lake City,  
 Beers, Jno. J., Emporia,  
 Buffum, F. C., Stanton,  
 Ballard, James C., Lake City,

Branham, A. G., Orlando,  
 Bernd, Peter, Bowling Green,  
 Buffum, E. H., Ocala,  
 Buffum, Mrs. E. H., Ocala,  
 Buffum, Miss F. C., Ocala,  
 Berry, Mrs. C. H., Glen St. Mary  
 Bennett, W. M., Okahumpka,  
 Bryant, J. M., White City,  
 Bell, J. D., Hawthorn,  
 Bailey, E. E., San Mateo,  
 Bradford, Wm. A., Jacksonville,  
 Borden, W. J., Oxford,  
 Barksdale, H. J., Jaffery,  
 Buell, C. M., Glenwood,  
 Bigelow, G. W., Bushnell,  
 Butterweck, Otto C., Brooksville,  
 Bush, G. G., Bellevue.

Crane, A. H., Nashua,  
 Chase, J. C., Sanford,  
 Crosby, O. M., Avon Park,  
 Corrigan, J. F., St. Leo,  
 Cunningham, S. A., Altoona,  
 Cunningham, Mrs. S.A., Altoona,  
 Cooper, W. A., Orlando,  
 Carnell, James, Ormond.  
 Campbell, Geo. C., Merrimack,  
 Cronise, C. T., Pensacola,  
 Clubbs, A. V., Pensacola,  
 Culley, J. F., Chuluota,  
 Curtis, C. H., Astor,  
 Caldwell, C. E., Melrose,  
 Chapman, J. T., Plymouth,  
 Clark, E. L., Longwood,  
 Carey, A. H., Winter Park,

Clark, N. L., Bushnell,  
 Crawshaw, J., Jr., Lawtey,  
 Crews, D. D., Jr., Crewsville,  
 Craver, J. C., Sutherland,  
 Chilton, B. F., New Smyrna,  
 Clark, J. Y., Fruitland Park,  
 Carlton, S. J., Arcadia,  
 Carlton, E. B., Arcadia,  
 Cuzner, A. T., Gilmore,  
 Correll, Adam, DeLand,  
 Correll, Mrs. Adam, DeLand,  
 Cook, Benj., Highland,  
 Cogswell, John F., Clarcona,  
 Calvin, R. W., Daytona,  
 Cook, J. W., Okahumpka,  
 Charentenay, Chas. de, St. Thomas

Duncan, A. L., Dunedin,  
 Dupee, Henry H., Paola,  
 Dreka, G. A., DeLand,  
 DeLong, Dr. W. H., Emporia,  
 Dickson, Sam C., Longwood,

Dought, H. F., Daytona,  
 Darby, T. A., San Mateo,  
 Douglas, R. C., Citra,  
 Daigre, Roman, Boardman,  
 Dubois, Emile, Tallahassee.

Elliott, D. H., Sanford.  
 Emmons, W.A., St. Andrews Bay

Edgerton, D. M., Coquina,  
 Earle, Wm. H., Tangerine.

Foster, Dr. Henry, Oviedo,  
 Fries, Albert, St. Nicholas,  
 Flye, James, Haines City,  
 Fabyan, John, Conant,  
 Friedlander, H., Interlachen,  
 Forrest, W. H., Citadel Hill,  
 Quebec, Canada,  
 Faye, A., Faye,

Frankland, A., Glen St. Mary,  
 Fuller, F. E., Okahumpka,  
 Fairbanks, Geo. R., Fernandina,  
 Felt, J. P., Emporia,  
 Froscher, Andrew, Titusville,  
 Foster, E. K., Sanford,  
 Felderhof, E., South Dennis, Mass

Gillen, Dr. H. H., DeLand,  
 Gaines, J. B., Leesburg,  
 Godbey, T. K., Waldo,  
 Gould, P. L., Eustis,  
 Griggs, Chas. D., Plymouth,  
 Grus, Wm., 113 Dearborn Street  
     Chicago, Ill.  
 Green, S. L., Federal Point,  
 Gusney, L. H., Merritt,

Greenleaf, D., Jacksonville,  
 Griffing, C. M., Waycross, Ga.,  
 Gore, Mahlon, Orlando,  
 Given, R. W., Winter Park,  
 George, E. B., Oak Villa,  
 Grosswendt, Mrs. M., Inverness,  
 Grosswendt, Th., Inverness,  
 Griffing, W. D., Macclenny,  
 Gillett, M. E., Weirsdale.

Hand, H. P., Daytona,  
 Hill, W. J., Sanford,  
 Hamlin, Arthur G., DeLand,  
 Hoyt, R. D., Seven Oaks,  
 Hastings, H. G., Interlachen,  
 Hastings, G. W., Interlachen,  
 Hopkins, C. L., Umatilla,  
 Haden, A., Orlando,  
 Haynes, L. E., Orlando,  
 Hart, E. H., Federal Point,  
 Hill, E. G., Lawtey,  
 Hatch, F. W., Oak Hill,  
 Hawks, Dr. J. M., Hawks Park,  
 Hubbard, E. S., Federal Point,  
 Hewett, W. C., Stanton,  
 Holdridge, W. H. H., Grove Park  
 Holdridge, Mrs. W. H. H., "  
 Hammond, E. C., Jaffery,  
 Hastings, Thos. H., Hastings,

Hasenyager, Chas. A., Interlachen  
 Hatch, A. L., City Point,  
 Herff, B. von, Washington, D. C.,  
 Harvey, H. H., Seffner,  
 Hawkins, J. K., Brunswick, Ga.,  
 Harding, J. W., Ormond,  
 Hind, Thomas, Georgetown,  
 Hampton, Henry J., Lane Park,  
 Hall, P. A., Glenwood,  
 Hawkins, Chas. W., Georgetown  
 Harrison, T. F., Citra,  
 Hall, F. E., Glenwood,  
 Hill, S. B., Lake Maitland,  
 Hillyer, Chas. V., Fernandina,  
 Hall, S. B., San Mateo,  
 Hardee, G. S., Rock Ledge,  
 Hawkins, W. W., Georgetown,  
 Hyden, V. P., Jaffery,  
 Higgins, C. W., Daytona.

Ingall, Chas., Federal Point,

Ingraham, J. E., St. Augustine.

Johnson, Tom, La Grange,  
 Johnson, J. H., Ormond,  
 Jackson, Arthur C., Palm Beach,  
 Jackson, Mrs. Arthur C., "  
 Jones, Cyrus, Bowling Green,

Johnson, W. H., Bartow,  
 Jones, Mrs. M. C., Bowling Green  
 Jackson, W. K., Inverness,  
 Jenkins, P. L., Seville,  
 Jones, C. J. K., DeLand.

King, J. B., Sanford,  
 Kleinascheg, A., Sara Sota,  
 Keck, Irving, Bowling Green,  
 Kilkoff, Miss Eva, DeLand,  
 Kingsbury, A. G., Winter Park,  
 Kimball, R. J., Melrose,

Key, A. D., Eustis,  
 Kirkpatrick, J. A., Pensacola,  
 Kessler, Thos. V., Pensacola,  
 Keown, W. J., Pomona,  
 Keck, Mrs. A. W., Bowling Green

Lund, C. P., Daytona,  
 Leedy, J. M., Keuka,  
 Lipsey, L. W., Citra,  
 Luttichau, H. von, Earlton,  
 Love, J. C., Leesburg,  
 Lytle, Frank H., Stanton,  
 Lord, H. P., Tampa,

Lee, G. M. Montclair,  
 Lewis, W. J., Manzo,  
 Lewis, W. F., Pensacola,  
 Leslie, James H., Panasoffkee.  
 Lee, Young G., St. Petersburg,  
 Lancaster, G. W., DeLand,

Lutghe, Henry, New Smyrna,  
La Montague, I. B., Winter Park,

Levi, Mrs., DeLand.

Mead, T. L., Oviedo,  
Manville, Mrs. A. H., Glen St.  
Mary,  
Mo t, James, Orlando,  
Marsh, W. A., Orlando,  
Mann, W. H., Mannville,  
McKibbin, J. C., Ocala,  
Mace, J. P., Lake Helen,  
Moremen, M. S., Switzerland,  
Mahan, S. H., Island Lake,  
Munson, F. W., Georgiana,  
McNary, Chas., Ormond,  
Markley, H. C., Greenville, S. C.,  
Munson, C. D., Eustis,  
Moore, J. A., Pensacola,  
Mellish, G. W., DeFuniak Spgs.

Morrison, D. A., DeLand,  
Magruder, G. M., Oak Hill,  
Moore, A. D., Candler,  
Margary, H. W. O., Eustis,  
Montgomery, L., Micanopy,  
Marsh, Harmon W., Okahumpka  
McCollum, J. T., Bushnell,  
McGraw, B. F., Buffalo Bluff,  
McKinney, A. S. J., Stanton,  
McKinney, Mrs. A. S. J., Stanton,  
Minter, Miss L. S., San Mateo,  
Montgomery, Mrs. L., Micanopy,  
Milton, T. N., Olustee,  
Miner, M. M., Emporia,  
Mims, R. E., Bonaventure.

Newell, C. H., DeFuniak Spgs.,  
Noble, Adam, Leesburg,  
Nevins, P. J., Merritt,  
Newcomb, Irving, Huntington,

Nairn, James, Panasoffkee,  
Nye, F. M., Waldo,  
Neher, E. J., Keuka.

Oren, Wm. McF., Bartow,

Oren, Mrs. Wm. McF., Bartow..

Pierce, R. W., Sunset Hill,  
Pratt, Dr. E. E., Limona,  
Powers, Stephen, Lawtey,  
Pugsley, Chas., Mannville,  
Peck, W. G., Winter Park,  
Plank, Levi W., DeFuniak Spgs.  
Porter, Miss Irma H., Citra.  
Pugsley, M., Woodbine,  
Perry, D. W., Pomona,

Paine, E. T., Jacksonville,  
Penley, H. E., Tampa,  
Price, Frank N., Orlando,  
Prevatt, F. B., Seville,  
Porcher, E. P., Cocoa,  
Post, C. C., Halifax,  
Pheil, A. C., Inverness,  
Patilla, J. A., Osteen.

Regan, J E., Pensacola,  
Rogers, J. Thos., Drayton Island  
Richmond, J. F., Okahumpka,  
Reed, W. F., Drayton Island,  
Rooks, O. P., Fruitland Park,  
Rooks, W. W., Fruitland Park,  
Reasoner, E N., Oneco,  
Rand, F. H., Sanford,  
Richards, A. C., Washington, D.C.  
Robey, Geo. W., Tampa,  
Rolfs, P. H., Lake City,

Rolfs, Mrs. P. H., Lake City,  
Rand, Geo. D., Winter Park,  
Robinson, Norman, Orlando,  
Russell, J. W., Daytona,  
Rogers, T. L., Daytona,  
Ross, W. M. P., Holly Hill,  
Robertson, W. A. R., Inverness,  
Rush, Jno. L., New Smyrna,  
Rogero, F. E., Armstrong,  
Richardson, Otis, Bronson.

Spencer, J. W., Pensacola,  
Stoddard, Henry E., Nashua,  
Snow, Geo. E., Eastlake,  
Styles, A. F., Jacksonville,  
Sampson, F. G., Boardman,

Sampson, Miss O. H., Boardman,  
Stewart, A. W. Galt,  
Soria, H. N., Caryville,  
Stubbs, J. T., DeFuniak Springs,  
Stanley, Miss Mary F., Daytona,

Swingle, W. T., Eustis,  
 Stillman, John E., Jacksonville,  
 Street, A. W., Ormond,  
 Stevens, H. B., Citra,  
 Sellner, Capt. Chas., Zellwood,  
 Seaton, Wm., St. Thomas,  
 Stebbins, Lucius D., Orlando,  
 Sheimer, Mrs. F. A. W., DeLand  
 Slayton, H. H., Glen St. Mary,  
 Stephenson, Henry, DeLand,  
 Scotton, J. M., Archer.

Thomasson, John, Gotha,  
 Taber, Mrs. G. L., Glen St. Mary,  
 Thatcher, O. R., Avon Park,  
 Taber, J. O., Sanford,  
 Taylor, Wm. A. Washington, D. C.,  
 Tischler, P., Jacksonville,

Upham, E. S., Sangus, Mass.

Van Ness, Eugene, Baltimore, Md.,  
 Varnum, Miss E. W., Fort Gates

Wade, J. S., Homeland,  
 Wilson, Lorenzo A., Jacksonville  
 Winter, Edward, Zellwood,  
 Woodworth, N., Welaka,  
 Wightman, L., Orange Park,  
 Williams, H. S., Rock Ledge,  
 Wright, Geo. H., Orlando,  
 Weld, Jno. C., Port Orange,  
 White, Chas. W., Citra,  
 Whitner, J. N., Lake City,  
 Warr, Aaron, Georgetown,  
 Wright, R. J., Tangerine,  
 Wyman, A. F., Archer,  
 Wilson, Geo. W., Ocala,  
 White, Jas. H., Georgiana,  
 Warner, S. C., Palatka,  
 Westlake, J. Willis, Lake Helen,  
 Wardwell, W. H., Brookline, Mass

Young, Chas. F., Orlando.

Shapley, Geo., Oak Villa,  
 Stewart, H. F., Daytona,  
 Stewart, G. G., Daytona,  
 Stewart, W. F., Daytona,  
 Stewart, Jno. W., Daytona,  
 Stanton, Miss L. A., San Mateo,  
 Suydam, G. L., St. Nicholas,  
 Smythe, A. W. C., Orlando,  
 Stone, B. W., Thomasville, Ga.,  
 Sampson, Mrs. M. J., Boardman.

Trowbridge, J. O., Waldo,  
 Turner, E., Lake Maitland,  
 Tiffin, H. J., Courtenay,  
 Thomas, Charles, Citra,  
 Thorp, H. H., Daytona,  
 Tillson, Davis, Leesburg.

Van Roe, J., Tampa,  
 Varn, W. B., Bartow.

Wakelin, Amos, Philadelphia, Pa.  
 Webber, H. J., Eustis  
 Woodbury, E. D., Duke,  
 Wright, H. A., Glenwood,  
 Watson, Thomas C., Pensacola,  
 Wright, H. C., 106 E. Pratt St.,  
 Baltimore, Md.,  
 Walker, H. P., Auburndale,  
 Whitner, Mrs. J. N., Lake City,  
 Ware, William, Glenwood,  
 Waite, F. D., Bellevue,  
 Wood, Geo. H., Tangerine,  
 Wyckoff, John S., Citra,  
 Wood, O. K., Cocoa,  
 Watson, Wilbur, Stanton,  
 Watts, S. W., DeLand,  
 Waugh, Thos. C., St. Thomas  
 Wilson, L. E., New Smyrna.

## Prefatory Note.

---

In compiling this report, the matter of general interest has been gathered under topical heads, preceded by a synopsis outlining the transactions of the session in proper sequence. The pith and point of lengthy discussions have been given with as little tedious detail as possible, and repetitions and irrelevant matter has been excluded, so far as this could be done without impairing the unity of the whole; the object being, without sacrificing any essential feature, to make the report more convenient for reference than a simple transcript of minutes.

As noted in the preface to the report for 1893, the last session of the legislature failed to make provision for the publication of the annual reports of the Society. For the issuance of this report, as well as the report for last year, the Society and the public are indebted to the public spirit of Hon. L. B. Wombwell, state commissioner of agriculture. Recognizing the importance of the work to the state, he has issued the reports for 1893 and 1894 as publications of his office, devolving the cost upon the revenues of the department of agriculture.

This temporary arrangement, by which the state has so greatly profited through the breadth of view and insight of our present commissioner, cannot, in the nature of things, continue. The legislature should make adequate provision for the purpose. The Society's special committee will lay this matter before the next session of that body. From this committee's forceful statement of the urgency and appropriateness of the legislation asked, we make the following extract:

The proceedings of the annual meetings of the Florida State Horticultural Society should be issued promptly, in a style that will not suffer by comparison with the published reports of similar societies in other states, and in sufficient numbers

to supply members, and others interested in the vast fund of information each copy would contain.

This is not a matter of interest to our membership merely, but its importance to the state at large will be appreciated by every public spirited citizen. Such a publication would be eagerly sought, and everywhere accepted as a disinterested account of our resources and advantages, and an authentic record of the methods and progress of our horticultural industry. In no other way could such information be so acceptable and effectively put forth. It is important to the growth and prosperity of our state, that this work be distributed throughout the states, and in foreign countries, and it should be issued in a form to command respect.

Nearly all the states have made provision for the publication of the proceedings of their horticultural societies; in some, all the expenses of these organizations are defrayed from the public funds; in one state no less than \$30,000 is annually appropriated for these purposes, and several have erected substantial buildings as permanent homes for their societies. In contributing of their time, means and ability to accumulate and bring together this valuable knowledge, the members do their part. Publication and distribution should devolve upon the state.

---

# SEVENTH ANNUAL MEETING OF THE FLORIDA STATE HORTICULTURAL SOCIETY.

---

The seventh annual meeting of the Florida State Horticultural Society was held at Jacksonville upon the invitation of the Board of Trade of that city. The society convened in the rooms of the Board of Trade on Wednesday, April 10th, at 3 o'clock P. M., in accordance with the programme as published, and adjourned sine die on Friday, April 13th, at 12 o'clock noon.

The attendance was large, the strong interest manifested was sustained throughout, and the work accomplished was satisfactory. Altogether it was one of the most successful meetings in the history of the society. Over 200 members were present, and there was a large outside attendance, the spacious hall being filled to overflowing at most of the sessions.

The convenience of the society and the comfort of its members were exceptionally well provided for. Mr. E. Bean, chairman of the society's committee on local arrangements, as well as of the Board of Trade's committee of entertainment, and his coadjutors, were congratulated on all sides upon moving everything smoothly and well, and making everybody happy.

Eight sessions were held as follows: Tuesday, afternoon and evening; Wednesday, morning, afternoon, and evening; Thursday, morning and evening; Friday, morning. As usual a session was omitted, and the time devoted to social functions. Opportunity for this was given on Thursday afternoon by a steamboat excursion to the jetties at the mouth of the St. Johns river, tendered by the Board of Trade.



## SYNOPSIS OF PROCEEDINGS.

---

(While the proceedings are not given in full detail below, this abstract is a complete epitome of the meeting, all its actions and events being arranged in order as they occurred. The addresses, papers, discussions, resolutions and other matters of general interest or speeial importance, are given in full under appropriate topical heads in the body of the report, and are simply noted here. Minor action and events and matters pertaining to routine business, are given in a more or less condensed form in this outline. Discussions on other subjects than horticulture, not resulting in action, and motions which failed, have been omitted, with or without mention, as their importance seemed to justify.)

---

### FIRST DAY—Afternoon—Opening Session.

1. Call to order by President Adams.
2. Prayer, Rev. Dr. E. B. Snyder, Jacksonville.
3. Address of welcome, Hon. D. U. Fletcher, mayor.
4. Response on behalf of the society, C. F. A. Bielby.
5. President's annual address.
6. Secretary's report.
7. Treasurer's report.
8. Motion that all member's tickets be countersigned by the secretary as requested by transportation lines, carried unanimously.

### Evening Session.

9. Call to order by the president.
10. Report of the Executive Committee. Several by-laws and an amendment to the constitution submitted and recommended by way of report. Discussed and laid upon the table.
11. Committee on Grapes called. Paper by A. W. Stewart, and paper by himself read by Chairman Geo. H. Wright. Discussion on grapes.
12. Committee on Figs called. No report.
13. Committee on Tropical Fruits called. No report. By request of the president, Thomas E. Richards addressed the society on the subject of pineapples. Discussion on pineapples.

**SEVENTH ANNUAL MEETING OF THE  
SECOND DAY—Morning Session.**

14. Call to order by the president.
15. "Diseases and insects of citrus" substituted for "apples and pears," and *vice versa* in the programme, by unanimous vote.
16. Committee on Catalogue called. Report by A. H. Manville, chairman. Catalogue committee given until next meeting to complete its report, and constituted a regular standing committee of the society by unanimous resolution.
17. In connection with report on catalogue, address by A. H. Manville on "Horticulture in the Gulf Region," suggesting joint meeting of the Florida and Texas Horticultural Societies. Texas State Horticultural Society invited to joint session by unanimous resolution.
18. Committee on Vegetables called. Paper read from J. A. Moore, chairman, (not present). Discussion on vegetables.
19. Committee on Diseases and Insects of Citrus called. Paper submitted from W. A. Marsh, member of the committee, who was not present. (In order to give place for the lectures of Professors Swingle and Webber, this paper was not read, but was filed for publication). Verbal report by Prof. W. T. Swingle, chairman, on "sulphur solutions, blight, foot-rot, and lemon scab."
20. "The White Fly or Black Smut." Verbal presentation of the subject by Prof. H. J. Webber, in accordance with special request of the society at last meeting. Discussions on diseases and insects of citrus.
21. Excursion tendered by the Board of Trade announced for Thursday afternoon.

**Afternoon Session.**

22. Call to order by the president.
23. Special Committee on Introduction of New Fruits called. Verbal report by S. S. Harvey, chairman. Constituted a regu'ar standing committee, and members continued for another year by unanimous vote.
24. Committee on Kaki called. No report. Discussion on kaki.
25. Committee on Fertilizers called. Paper read by B. N. Bradt, chairman. Paper (prepared at the request of the society) read by E. O. Painter. Discussion on fertilizers.

**Evening Session.**

26. Call to order by the president.
27. Election of officers. Result as follows: President, Dudley W. Adams; First Vice-President, George L. Taber;

Second Vice-President, J. W. Mellish; Third Vice-President, O. P. Rooks; Secretary, A. H. Manville; Corresponding Secretary, E. O. Painter; Treasurer, J. B. Anderson; Executive Committee, Lyman Phelps, C. F. A. Bielby, E. S. Hubbard.

28. Committee on Transportation called. Verbal report by G. P. Healy, chairman. Discussion on transportation.

---

**THIRD DAY--Morning Session.**

29. Call to order by the president.

30. Report of the Executive Committee on Constitution and By-Laws taken from the table. Amendment to the constitution passed unanimously. (See constitution). By-laws referred back to the committee.

31. Place of next meeting taken up. Invitation from Board of Trade to hold next meeting in Jacksonville read. A. G. Avery and W. A. Cooper of Orlando, placed the latter place also in the field. Discussion. Jacksonville selected by vote.

32. Committee on Peaches and Plums called. Paper read by S. S. Harvey, chairman. Discussion on peaches and plums.

33. Communication read from Stephen Powers and C. W. DaCosta, inviting members while in the city to drop in upon the Farmer and Fruit Grower at home.

34. Committee on Strawberries called. Paper by H. E. Stoddard, chairman. (This paper which is published upon another page, was not read, Mr. Stoddard giving way to the chairman of the Committee on Nomenclature who was obliged to leave by the next train.)

35. Committee on Nomenclature called. Paper read by E. S. Hubbard, chairman. Discussion.

36. Committee on Citrus Fruits called. No report. Remarks by Professors W. T. Swingle and H. J. Webber. Discussion on citrus fruits.

**Afternoon.**

The excursion was one of the most enjoyable features of the meeting. All the members went with their wives and daughters, and a goodly delegation from the Board of Trade, and their wives and daughters. From start to finish the hum of animated conversation from the groups about the decks and cabins was uninterrupted, save to catch some new point of interest pointed out by the River Improvement Trustees, or to partake of the liberal collations provided. At least no interruption worth mentioning, for the steamer was turned

speedily about after passing the jetties, before the heavings of the mighty deep had any very perceptible effect.

Probably never before in the state did so many prominent horticulturists from so many different sections meet so many other prominent horticulturists from so many other sections. Old friendships were renewed, and new acquaintances formed. Everybody seemed to have been waiting this opportunity to ask somebody else something. More than in the formal sessions the real gist of things is brought out in these familiar talks between the acts, when everybody speaks and speaks his mind. When the steamer touched her dock again, the faces plainly said they were not half through. The way the choruses of the folk-lore songs and ballads rang out in the gloaming, and the heartiness of the vote of thanks to Secretary Smith and the Board of Trade, certainly betokened that everybody had had the very best possible time.

#### Evening Session.

37. Call to order by the president.
  38. Unanimous resolutions of thanks to the State Commissioner of Agriculture, Jacksonville Board of Trade, and general passenger agents of the state.
  39. Committee on Marketing called. Verbal report by Thos. Hind, chairman. Discussion on marketing.
- 

#### FOURTH DAY--Morning Session.

40. Call to order by the president.
41. Committee on Irrigation called. Paper read by A. G. Kingsbury, chairman.
42. Vice-President Mellish called to the chair.
43. Committee on Entomology called. Paper read by Prof. P. H. Rolfs, chairman. Discussion on entomology.
44. Committee on Ornamentals called. No report. Discussion on the best lawn grass for Florida.
45. Committee on Apples and Pears called. No report. Discussion on pears.
46. President resumes the chair.
47. Motion by J. T. Stubbs that a committee of three be appointed to investigate and report upon legislation for the purpose of preventing the introduction of diseases and insects, as suggested by Prof. Rolf in his paper on entomology. Carried. President announced the following committee: J. T. Stubbs, P. H. Rolfs, H. J. Webber.

Adjourned sine die.

## Address of Welcome.

---

BY HON. D. U. FLETCHER, MAYOR OF JACKSONVILLE.

---

"Mr. President, Ladies and Gentlemen—It is a pleasure to extend to the State Horticultural Society the cordial greeting and hospitality of the city of Jacksonville. Speaking for the government and speaking for the people, I wish it understood that there is not a city, a town, a hamlet or community in Florida which has less than our kindest feelings and best wishes; there is not an enterprise or an undertaking in the state, no matter where located, for which we do not desire every possible success and prosperity. Whether it brings grist to our mill or not, directly we realize that as Florida prospers, so must we; as developments go on in the state, the better for us; no section or community can build up to our disadvantage; no advancement can be made at our expense. This is our view. This is the view which we cultivate, and we are always glad to have with us our neighbors and friends.

"At all times our gates are open wide to the citizens and well wishers of Florida. Especially is it agreeable and pleasant to have with us this society which is bent upon promoting the development of the material interests of the state. I understand that you are very close to, indeed that you represent the most important industry in the state to-day, and you are here for the purpose of considering means and methods which will advance that industry and render it more profitable.

"Any association or individual who is engaged in an effort to make easier and more profitable the cultivation of the soil, deserves the encouragement and gratitude of mankind. It is a singular thing that while more people are engaged in agriculture than in any other pursuit, doing the hardest work, they receive the least remuneration, although agriculture and horticulture are the foundation of all prosperity, and the source of all wealth. It was wise philosophy which was uttered by the Persian king when he said that 'the authority of the prince can only be maintained by military force, military force can only be maintained by taxes, all taxes must rest on agriculture, and agriculture can only flourish by the protection of justice and moderation.' The most cruel war measure and that which accomplished the most destruction and ruin to the people, was that adopted by the Goths when

they deprived their captives of the right hand—the hand that guides the plow. We may bond our cities and dig out our rivers; we may pave our streets, beautify and adorn; we may erect immense buildings, and go on with great improvements; we may borrow and spend, boast and display, but no commerce will float on our rivers, the owls and bats will inhabit our buildings, and serpents and toads will dwell in our streets, unless the soil is made to bring forth fruit. So I say this work needs to be made attractive, and needs to be made profitable. In Florida we have an unsurpassed climate, we have splendid natural advantages; nature has dealt bountifully with us; to render our harvests abundant and our products profitable, obstacles must be met, and difficulties overcome. It is for you to solve these problems."

Continuing, the speaker touched upon some of the more serious questions which confront the producers of this state, notably, transportation and marketing. In his opinion the legislature had made a great mistake in allowing the small appropriation asked for the Horticultural Society to fail. He believed, poor as the state was, it could afford "a few thousand dollars to assist in destroying the insects which kill the trees; in proving that new plants may be cultivated, new fruits grown; in demonstrating the value of new materials, new methods and the like." Concluding as follows: "Now, gentlemen, wishing this society abundant success, and hoping that you will be able to accomplish much benefit to the people by your efforts and deliberations, I again extend to you a hearty and cordial welcome."

---

## Response to the Address of Welcome.

---

BY C. F. A. BIELBY.

---

"Mr. President—As you have asked me in behalf of yourself and the society, to reply to the address of welcome which the mayor of the city has so cordially extended, I beg to say that I am more than willing to comply, because I feel a personal as well as a society pride in our being here to-day; for it is a fact, as you will perhaps remember, Mr. President, that I have always advocated that the State Horticultural Society should hold its meetings not simply to-day, but always, in this metropolitan city of the state.

I have always held this because I believe it is a good thing for us to meet yearly in this city which is the gateway of entrance and exit. This is the proper place to hold our sessions, for the great trial of country life is its solitude and loneliness. One reason, if not the principal reason why our young men leave the country and go into the cities to live, is because of this loneliness; and we know that there are many who, year after year, never go outside of their county, and for them how wearisome the life of the farmer must become. Now, I maintain, that we should have an opportunity once a year, at least, to meet in the city through whose gates the wonderful products of our farms and orchards have passed, freighted with the hopes and wishes of hearts anxious for the outcome. It has been said sometimes that Jacksonville does not care for meetings of this sort; that it does not care to have within its borders assemblies of the nature of this society, but it has never occurred to me that we would lack a welcome, and the kind and eloquent words of the mayor show that Jacksonville is not insensible of her indebtedness to those whom we represent for their part in the splendid progress which she is making. Indeed, we may judge of our success by hers, and when we look upon her new and handsome buildings, her paved streets, her deep water to the sea, her promise of improved water front, and see everywhere the air of business activity and prosperity, we may properly feel that a portion of this prosperity is due to us and our efforts. And, this being true, it would seem that we are not so poor and so unsuccessful as some would make us appear.

"I believe that one of the things we ought to do while here is to enter our protest against the idea which is so vigorously pushed that we are on the verge of disruption, so to speak, as a band of men engaged in the particular industry of fruit growing; that it is so unpromising and so fruitless that we may as well desert it at once and altogether. We believe, as I have said, that it is due in part to our efforts—and the mayor very properly admits this fact—that Jacksonville is making such rapid and marvelous improvements. If the old adage be true that when the tiller of the soil is impoverished, the marts of commerce suffer; we have here the proof that we are not in such bad shape as we are shown by some to be. We do not see any evidence of suffering in Jacksonville. On the contrary, every sign of vigorous, healthful, prosperous and substantial growth, and from this we may take heart and go home encouraged to our work. It is an object lesson, Mr. President, for everyone, and I am sure it will inspire us all to renewed industry.

"We may possibly be able to shake off the idea that the orange grower has no future in sight. I have to admit that the view at present is not so rosy as it was ten years ago, but I have to inquire also, did we not expect too much ten years ago, just as some of us to-day are prone to expect too little and to become disheartened? Was it reasonable to expect that the owner of a five acre grove ten years of age would be in affluence? Perhaps it was not unreasonable, I confess that I believed it, but if we have come out of this dream, out of this paradise, let us not fall into the other extreme and despair of our industry. This one thing we must learn, that the men that can raise the best fruit for the least money, are the ones destined to be successful, and that it is the special, I might say the only province of this Horticultural Society, to teach men how to grow the best fruit for the least money. The orange of Florida is peerless, it stands without a rival or a second, and when I speak of the orange of Florida, I do not mean the thousands of boxes sent out annually which should go to the refuse pile, but the orange that has no rival on the face of the earth, the orange which the State Horticultural Society has been largely instrumental in making what it is. We talk of the climate, soil, fertilizer and all the circumstances which fit together to make orange growing in Florida, so far as the bulk of the fruit is concerned, as successful as it is, but I have no hesitation in saying for our society that in the last seven years we have improved the quality, appearance and texture, and thereby raised the standard of the Florida orange more than 25 per cent. And the men who never attend our meetings, who scarcely ever hear of us, you meet them everywhere, and if you ask them about fertilization and orange and fruit culture, you will find that almost every one of them has picked up some portion of the methods which we have shown to be best adapted to the raising of first class fruit on all kinds of Florida soils; and now, Mr. President, when the standard of every man who raises fruit in the state of Florida shall be the ideal which this society has created, then we shall have gone a long way towards solving the difficult problems before us.

"To you, Mr. Mayor, and to those whom you represent, I beg to convey the thanks of our president and the thanks of this society for your kindly welcome, and to assure you that we appreciate the welcome and the cordiality with which your city has thrown open her gates to us."

---

## President's Annual Address.

---

BY DUDLEY W. ADAMS.

---

Ladies and Gentlemen of the Florida State Horticultural Society :

For the seventh time the Florida State Horticultural Society meets in annual convention. The augmented numbers who meet here to-day give us cheer, for they tell louder than words of the growth and extending influences of our society. We warmly greet the veterans who have been long with us in the field, and heartily welcome the recruits who swell and strengthen our hosts. It is a source of great pride to be able to say that our growth has been steady and rapid from the very first until to-day. Though one of the youngest, the Florida State Horticultural Society is one of the largest, most useful, intelligent and active societies of the kind in the United States. The work we have done we look back to with satisfaction, and the work before us we look forward to with hope, determination and confidence. When the society was organized, the horticulture of the state was comparatively in its infancy; the orange and lemon business was just beginning to be of consequence. Florida's peaches, pears and pomelos were practically unknown. The pineapple, strawberry and grape were scarcely thought of as Florida probabilities of importance. The horticulturists of the state were mostly at work in the dark as to the best varieties, modes of planting, cultivation and fertilizing.

### A STRANGE SOIL AND CLIME.

Of those who were engaged in horticulture in Florida at that time, some were at a strange business in a familiar soil and climate; a few more were in a familiar business in a strange soil and a strange climate; but the great majority were engaging in a strange business in a strange soil and strange climate. Of all of these was the Florida State Horticultural Society composed at its organization. All were anxious scholars, not one was a competent teacher. We knew that the people of the United States wanted and would use fine Florida fruit, and we determined to find out how to grow it for them. To that end almost exclusively have been devoted the efforts of our society. We have counseled together as to the soil, planting, varieties, fertilization, cultivation, budding, pruning, etc. The progress we have made, and the success we have achieved, is evidenced by a crop this

year of nearly 5,000,000 boxes of oranges; pears, grapes, peaches and strawberries by the car load, and young plantations of each that in the near future will furnish train loads.

That we have reached perfection in varieties and modes of cultivation of these fruits, no one will claim. On the contrary, it is plain that we are only on the threshold of economical, scientific, successful and practical production of fruit. But we have now reached a point where we can look ahead and with certainty see what the possibilities and probabilities of production are. We see now five million boxes of oranges, and trees enough planted that with our present knowledge will in a few years bear ten million, fifteen million, or twenty million boxes; and pears, peaches, pineapples and strawberries are coming in uncounted carloads.

#### IS THERE OVER-PRODUCTION?

This fact brings us face to face with the great problem of to-day. Our efforts at production have been so successful that we look with pride upon our magnificent crops of fruit and vegetables, and can confidently rely on rapidly increasing quantity and improved quality. Here then is the problem. What shall we do with it. Is there an over-production?

The five million boxes we have grown this year would only give each inhabitant of the United States one orange a month. Is that too many? And yet the growers have not received from the sale of this crop the cost of its production. Acres of cabbage are rotting in our fields to-day, and millions of people are hungry for cabbage. In view of these facts, is it wise to continue to devote undivided attention to the growing of fruits and vegetables, for which we receive no fair compensation?

Though I do not believe we are growing more fruit than ought to be used under proper conditions, yet it does occur to me that we have now reached a point where we must grapple with the stubborn facts that our present production has outgrown our present means and methods of transporting, distributing and selling. It is the height of folly to go on increasing our output without at the same time providing some way to dispose of it at a profit. That thing must be done, and it will be well for this convention to give its best thoughts to a discussion of the paramount question. With this in mind, it may not be out of the way to call your attention to some of the prominent features of the situation.

As stated before, five million boxes of oranges will just about give each inhabitant of the United States one orange a month. It would seem possible that, under favorable condi-

tions, each person could be induced to eat one orange a week and not become surfeited, and that would take twenty million boxes. Can we bring about those conditions?

#### MUST BE SOLD CHEAP.

To popularize oranges and have every one eat them freely, they must be sold to the consumer at popular prices. At fancy prices like 40 cents, 60 cents, or \$1.00 per dozen, only the few can use them freely, a good many moderately, but a great many more sparingly or not at all. If the money the consumer pays for fruit could be divided among the grower, carrier and seller in fair proportion to the service rendered, this could be done. The grower has spent money, time and care, and has originated the product, yet under the present system he is the last one paid. He sends out a lot of oranges; the transportation company takes charge of them, and when they reach their destination, the freight must be paid in full, and the drayage must be paid in full, and then the commission for selling must be paid in full. If the fruit brings too little to meet these charges, the grower is called upon to make up the deficiencies, and in any event he gets only the surplus after all other charges are paid. Whether the price of fruit is high or low, whether the grower gets anything or not, the transportation is always high, and is always the first bill to be paid.

#### HIGH FREIGHT RATES.

Now, my fellow fruit growers, it is time for us to have something to say about this thing. The present rate of freight and this year's price of fruit, means absolute ruin to our industry. Last week I paid \$330 freight on a car load of oranges, and the same week a neighbor offered to sell me a five-acre orange grove seven years old, in good condition, for \$300. That is a startling statement. I give the price of a five-acre orange grove and \$30 to have one car load of oranges carried to market!

Now we should not go to the transportation companies as supplicants asking a favor, but we should go as masters of the situation and claim our rights.

The average price the grower has paid for transporting this crop is not far from 65 cents per box. The average net amount received by the grower will not exceed one-half or two-thirds of that sum. That is not right. It is not a fair divide. The business of a carrier is a legitimate and proper one, and entitled to fair compensation. So is the business of horticulture. There is no good reason why one should have all that is in it, and the other nothing.

The common law recognizes the railroads as common car-

riers who are lawfully bound to carry goods at a fair rate. Who will decide what is a fair rate? The lawyer will answer: "The courts." Very true. Theoretically that is correct, but practically it is impossible.

#### THE RIGHT OF MIGHT.

The average orange grower can never reach justice thus, for he has not the sinews of war to conduct a protracted suit against a great corporation. The transportation companies assume the right to say how much they will take, and they take it. The other party to the arrangement has no voice in the matter. That is not a disinterested tribunal. Its interests preclude the possibility of impartial judgment.

There is but one way in which we can get a just and fair tribunal accessible to the poor and lowly, as well as to the rich and strong, and that is by the action of the sovereign people.

This brings us to another phase of the subject, and that is the proper relationship of the horticulturists to the state and nation. In a republic, the people are not only the recipients of the benefits of good government, but in them is placed the sacred duty and responsibility of making it a good government. The horticulturist is no exception. He has a right to expect of the state the protection of just laws. The state has a right to expect him to do his full share in making and enforcing the laws. Some very good men seem to think it particularly meritorious to say: "I attend strictly to my business and let politics alone." Such men are selfish. They neglect the first sacred duty of American citizenship, and are deserving of censure. They expect the protection of the laws, and yet will not do their part in making them what they should be.

Gentlemen, the laws of a state are exactly what the law-makers make them. If we neglect our duty and allow the laws to be made by the professional place hunter, we must expect the laws will be made to subserve his interest. If the producers and business men of the state make the laws, they will be made in accordance with their ideas of justice. If the horticulturist refuses to do his duty as a sovereign citizen, if he neglects to study public questions and act on his knowledge, his punishment will consist in having his interests ignored by those who have done their duty as responsible citizens of the republic.

#### ASSERT YOUR RIGHTS.

Here then is the plain road. Instead of going to the common carriers and begging for favors, assert your rights like men who know them, and enforce justice at the ballot box.

To the practical horticulturist whose heart is in, and whose revenue depends on, his business, partisan politics is a matter of small moment. The only use the horticulturist—the true patriot—has for any political party is as an instrument to enact into law such principles as he deems for the good of the country.

If we believe that the prosperity of our state and business will be advanced by a reasonable and just control of the common carriers of the state, then we should say so in the only way we can speak with authority, or forever after hold our peace. To get together in conventions, or in pairs, or in groups, and talk and write about getting "concessions" from the railroads, and all that stuff is child-like, and places us in the false position of mendicants, when really we are the masters, and ought to be taking the proper steps to secure our just rights.

#### WANTS NO FENCES.

Another thing, I have built and am now maintaining 1,950 rods of fence. For my own use? Not at all. It is not only an expense and of no use to me, but an actual damage. It is in my way. Why did I build it and why maintain it? Because the laws of the state permit my neighbors' stock to come on my land, take my corn and oranges and oats and carry them away. If it is just for him to permit his stock to come and take my crop, why should the law prohibit him from sending his children or his servants, or coming himself and take all that is not defended by force?

Speaking for one horticulturist, I can say that I have paid more for fences than all the state, county and school taxes I have paid in Florida. What my neighbor horticulturists and I have paid for fences would buy all the stock, sheep and razorbacks in the neighborhood, powder and ball enough to kill them, and have money enough left to run a free school a good term each year.

#### STUDY NATIONAL AFFAIRS.

Then again, not only our duty as citizens, but our interests as horticulturists, require that we give thought and attention to the affairs of the nation. It is useless for us to plant and water and manure unless we are to have the benefit of the harvest.

The crop of the horticulturist is one of semi-luxury. It is one that in time of want the hard pressed people can and will get along without in some sort of a way. Now, then, ours more than most lines of business, depends for its existence and prosperity on profitable employment of the whole people. That this prosperity depends largely on national enactments,

no one will deny. Throwing partisan politics to the winds, the horticulturists of the state and nation should give their best thoughts to an understanding of these national issues, and so act at the crucial time as to promote the industries and prosperity of the whole country.

With just rates for transportation, with proper arrangements for distribution, with a great nation of workers and business men profitably and steadily employed for customers, our business will be on a sound, permanent, and paying basis.

---

## Reports of Secretary and of Treasurer.

---

(Mr. W. S. Hart, who had been secretary of the society for a number of years, resigned some time previous to the Jacksonville meeting, and Mr. Arthur H. Brown was appointed to fill the unexpired term. Mr. Brown entered upon the duties of the office March 26th, 1894, continuing to discharge the same until the end of the official year, May 20th, 1894, which included the society's session at Jacksonville).

---

### Synopsis of the Report of Secretary Hart.

Mr. Hart expressed his regret that imperative duties rendered it impossible for him to be present at Jacksonville or to complete his term of office. It was a source of satisfaction to him to know that the secretaryship would pass into such competent hands for the unexpired term. While Mr. Brown was placed at some disadvantage in undertaking the remaining work of the year, which was considerable, so suddenly and with the annual meeting so near at hand, still he felt confident the society's interests and comfort would not suffer by the change.

He reviewed the work of his office, up to the time of his resignation, at some length, referring especially to the preceding meeting, (Pensacola, April, 1893).

The society's funds were not sufficient to publish its yearly reports, heretofore this had been provided for by a guarantee fund subscribed among the membership. The effort to obtain an appropriation for this purpose at the last session of the legislature, while it had met with sufficiently favorable reception to justify the expectation of future action, had been unsuccessful. The offer of the Hon. L. B.

Wombwell, State Commissioner of Agriculture, to issue the report as one of the publications of his office, had, however, been accepted. The funds available for this purpose did not admit of its immediate publication after the meeting, but rendered it necessary to issue the report in serial form in the "Monthly Bulletin," issued by the Department of Agriculture, which had been done. The commissioner had subsequently gathered the matter in pamphlet form, and in conformity with the agreement with the society had sent copies to the membership. In addition to this, an edition of some 5,000 copies had been struck for free distribution through the Bureau of Immigration, and had been widely disseminated in this and other countries, which, the secretary thought would be of great benefit to the state and the society. Mr. Hart called attention to the fact that Commissioner Wombwell's action in offering to publish the report, had been entirely voluntary and gratuitous, and prompted by good feeling for the society, and he had no doubt it would receive a proper acknowledgement from the society.

The society having been relieved of the burden of publishing the report, it had been possible to meet all expenses for the current year, and leave a small balance in the treasury.

Mr. Hart explained the efforts which had been made to bring in new and desirable members, which had resulted very satisfactorily as the increased membership showed.

The receipts for the year up to the time of his resignation, had been \$270.39; the expenditure, including some debts of the previous year, amounted to \$212.56, of which he remitted a statement; \$50 had been submitted the treasurer, and \$7.83 turned over to his successor.

---

#### Synopsis of the Report of Secretary Brown.

After reading Mr. Hart's report, Secretary Brown read his own report for the interim between Mr. Hart's resignation and the Jacksonville meeting. He submitted a statement of expenditure amounting to \$40.50. He had received \$167.49 and there remained in his hands \$126.99. At the opening of the Jacksonville meeting the rolls showed eight life and two hundred and eighty-six annual members.

---

#### Synopsis of the Report of J. B. Anderson, Treasurer.

In submitting his statement as treasurer, Mr. Anderson said that owing to the efficient manner in which the secretary and ex-secretary had performed their duties, the treasurer's task was very light. He had received \$50 from Secretary

Hart, and a 10 per cent. dividend of \$13.95 from the First National bank of Palatka, and had \$63.95 on hand. He had learned from the receiver of this bank in which the society had a fund of \$139.50 at the time of its failure, that as nearly as he could say there would be another dividend of 15 per cent., which would save to the society about 50 per cent. of the entire deposit.

---

**Resolution by the Executive Committee.**

In abridging for publication the report of Ex-Secretary Hart as read at the last meeting of the society, the secretary is instructed to place on record in this connection in the published report of the proceedings of the society, an expression of the high appreciation in which the services of Mr. W. S. Hart as secretary, are held by this committee.

---

## Catalogueuing Our Reports.

---

**Report Read by A. H. Manville of Denver, Putnam County, Chairman Committee on Catalogue.**

At the Pensacola meeting of the society, (April, 1893), it was enacted:

"That a special committee of five be appointed by the president, on catalogue, whose duty it shall be to prepare a catalogue of the fruits of the state on a systematic plan, on the same general lines adopted by the American Pomological Society, showing the relative adaptability to each section of the several fruits grown in the state. The same to be submitted at the next annual meeting."

In conformity to the above, the following committee was appointed: A. H. Manville, L. W. Plank, G. L. Taber, J. H. White, R. D. Hoyt.

The compilation of an initial catalogue of this character, having a systematic arrangement at once simple and comprehensive, and possessing that accuracy of detail without which a work of this kind would be valueless, involves careful preparation, extensive correspondence and laborious collation. The magnitude of the undertaking will be appreciated by those who have assisted in the revision of the fruit catalogues of our older societies.

Your committee was unable to take up the work at a date

sufficiently early in the society's calendar to complete a report for this meeting. Considerable progress has, however, been made. A plan has been laid out, the preliminary lists prepared, and the work of "marking up" is well under way.

Had the committee been able to finish the report in time for this meeting, it would not have been practicable to present the draft of catalogue to the society until the tables could have been printed for the convenience of members in discussing the report. In fact, to give opportunity for due consideration, a printed copy should be sent to each member in advance of the meeting at which the subject is taken up.

In view of these facts your committee has thought best to suggest that the time for its report be extended until the next annual meeting.

After the reading of the above report, the following resolution was unanimously passed:

That the committee be given until the next annual meeting to complete its report; and

That the word "special" be stricken from the title of this committee, and the word "standing" be substituted therefor, constituting the Committee on Catalogue, one of the regular standing committees of this society.

---

## Florida and Texas.

---

**The Texas State Horticultural Society Invited to Joint Session.**

---

BY A. H. MANVILLE.

The southern boundary of the United States describes a sort of ogee, with short curve around the Gulf, and long curve up the Mexican line and Pacific coast. This line is nearly 3,000 miles long from point to point, and within 150 miles of it lie the sub tropical regions of this country. But, unfortunately for our figure, this strip is not sub-tropical throughout its entire length. When we apply this test our ogee falls in two in the middle. The sub-tropical region which follows down the Pacific coast and passes the head of the Gulf of California does not reach the New Mexican line, and the sub tropical region that follows the Gulf from the Keys to Mexico, stops short at the plains of Western Texas. Separated by the arid table lands and elevated regions of

Western Texas and Southern New Mexico, which form the back bone of the continent where crossed by our southern boundary, our sub-tropical regions lie in two segments, one at either end of this line.

I trust I shall be pardoned these allusions to trite geographical facts, I wish to emphasize the point that our sub-tropical country is naturally and widely separated into two great divisions. The sub-tropical region of the Pacific lying crescent shaped convex to the Western ocean, with its horns resting on the Golden Gate and the Arizona line; and the sub-tropical region of the Gulf, likewise crescent shaped, concave to the Gulf of Mexico, and extending from Cape Sable to the Rio Grande.

These two widely separated regions have much less in common than we have been wont to think. While both are sub-tropical, they are at variance in topography, soil, climate and productions. This difference is most apparent in the two extremes. California farthest west, and Florida farthest east. There the surface is broken, even mountainous, here level; their climate is unlike ours in nearly every condition, the only marked similarity being that neither is subject to very low ranges of temperature; they have weather incident to narrow strips between high mountains, or between high mountains and the sea; our atmospheric conditions are modified by the broad expanse of water which surrounds us; their seasons are the reverse of ours, their soils require different manipulation than ours; in horticulture their most valued acquisitions come from Europe, ours from Eastern Asia. I will not stop to amplify these dissimilarities, which are apparent, nor to point out others that might be mentioned.

Because California products have been found in a few markets alongside of our own; because California also raises oranges; or because there, too, palm trees grow in the southernmost confines, we have fallen into the habit of measuring ourselves up by the side of California, and have come to look upon the Golden Gate as our competitor and exemplar. But, Mr. President and fellow members, I submit that the horticulture of the Pacific coast is too dissimilar to have value as a criterion, and California is too far away to become a rival.

Dismissing the Pacific sub-tropical region, let us consider for a moment the other great sub-tropical region of the United States, the Gulf coast country, of which our own state forms a part, but, let us not deceive ourselves—by no means the only important part.

While we have been taken up with the California bugaboo,

absorbed in measuring ourselves by standards in vogue on the other side of the continent, we have overlooked, literally overlooked, a rival near at hand; a real rival of our own size and make-up; a rival about to finish training and likely to give us a serious contest for horticultural honors and preferment in the near future.

Part of our own coast country; at the other end of this sub-tropical crescent; just across the Gulf; I refer to coastwise Texas. The surface of the country, the soil, the climate and the horticultural productions of coastwise Texas are like those of Florida. The products of her market gardens are already well known in the great markets of the Mississippi valley; she produces the small fruits we do; the figs, pomegranates, grapes and miscellaneous fruits that we grow, succeed there; during the past few years thousands of acres of peaches, plums and pears have been planted in this Texas coast country, oriental varieties, the same as our own, from China, Japan, and the East Indies; as in Florida most of the varieties of these and similar fruits from Europe as well as those from the north, do not succeed.

But, we say complacently, "this is not an orange country." Let us not be too sure of this. Coastwise Texas reaches farther south than Lake Worth or Punta Gorda, and its horticultural records not only report oranges yielding abundantly, but also limes, while banana culture is laid down as having already attained a commercial success. It is, in fact, a question whether in citrus culture in one respect at least, they are not in advance of us; for they are planting their orange groves on hardy, dormant-in-winter stocks, which their growers claim mature the fruit before frost, ripening it for the high prices of the early market, and rendering the trees resistant to the lowest degree of cold to which that region is liable. Their trees are reported uninjured by the unusually severe cold of the past winter.

This region across the Gulf is by no means of limited extent. The sub-tropical coast country of Texas embraces an area equal to the entire peninsula of Florida. Old residents have been developing its horticulture for years. Mr. G. Onderdonk, one of the pioneers, who began before the war, speaking way back in the eighties of Southeastern Texas, says: "Starting with only a few dimly lighted landmarks, she has beaten her toilsome way until she has a well defined horticulture." In 1891, speaking before the Texas State Horticultural Society, he says: "Many have presumed that Southeastern Texas could produce only cacti, mesquite and thorny chaparral, but, with the array of fruit we have here, none can speak lightly of the pomology of this large area.

The pomology of southeastern Texas, so distinct from that of other parts of the state, has vastly outstripped the most sanguine expectations of her students of forty years ago."

Texas is about as large as New England and the Middle States, or all the cotton states east of the Mississippi river combined. In the older settled districts in the northern part of the state, fruit culture has been long established, and is about as nearly related to the pomology of the coast as the pomology of upper Georgia is to that of Florida. Less than a year ago the Texas State Horticultural Society met at Rockport, which is well down on the coast. The fruit exhibit came from the coast country. Referring to it, the leading horticultural journal of the state, the "Farm and Ranch," says: The exhibits were the finest ever seen in the state.

Attracted by its horticultural advantages, people are going to this country for the purpose of fruit growing, new towns are springing up, land is being cleared and hundreds of orchards planted. They are having such a boom over there as we had late in the seventies.

Working under conditions similar to ours, raising the same fruits for the same markets we do, these intelligent, energetic horticulturists of the Texas coast country are, not only competitors and compeers from whom we have much to fear, as well as much to learn, but, they are also neighbors; for it is but a short span from the Perdido to the Sabine, and the intervening strip across lower Alabama, Mississippi and Louisiana is of the same character, part and parcel of the sub-tropical region of the Gulf.

Running over the history of horticultural progress on opposite sides of the Gulf, one is struck that the lines followed are so nearly parallel.

Twenty years ago our first State horticultural society was organized at Palatka, and called the Florida Fruit Growers' Association. Its second, and perhaps most important meeting was held in 1875 in this city, scarce a block from this spot. The governor thought the occasion of sufficient importance to require the presence of himself and cabinet, and in response to the invitation of the association, the legislature adjourned to enable its members to come down from Tallahassee and attend. There are a few, a very few persons in attendance at this meeting who will recall with what interest we listened to the discussion on "Florida as Compared with the West," led off by the venerable Solon Robinson, ex-agricultural editor of the New York Tribune, Floridian by adoption, or to Col. Dancy, the pioneer orange grower, a recognized authority, one of the few men at that time possessed of an old bearing grove, as he expatiated upon

"Orange Culture as an Investment for Capital." Most of us were beginners who had just finished planting our first five acres. A report of this meeting was issued from the press of the old "Florida Agriculturist," then published in this city and edited by Col. Codrington. Among the names of those who participated in the proceedings, names that have a place in the history of our state, are H. S. Sanford, P. P. Bishop, A. S. Baldwin, Columbus Drew, J. S. Adams, Harrison Reed, H. L. Hart, E. K. Foster, and "Concussion" Hardee of "Honeymoon."

With the passing of the speculative period in orange culture, interest in the Fruit Growers' Association waned, and it gradually fell into innocuous desuetude.

This brings us to the practical horticulture of the present. In 1886 we organized the Florida Nurseryman's Association. The interest in the meetings of this association was so general that it was determined to widen its scope. In 1887 the Florida Nurseryman's Association issued an invitation to the horticulturists of the state to join in the formation of a state horticultural society. This was accomplished in 1888 by the joint action of the Florida Nurseryman's Association, members of the old Fruit Growers' Association and other horticulturists. In 1889 the Florida State Horticultural Society entertained the 22d biennial session of the American Pomological Society at Ocala. In 1892 we began the regular publication of our proceedings, including stenographic reports of the discussions. We are about to take up the work of cataloguing our fruits. In the words of President Adams, "the State Horticultural Society has steadily grown in numbers, influence and usefulness, till at the age of seven years it is the peer of similar societies in any state in the Union."

Meanwhile, what has been going on across the Gulf? In 1886 the North Texas Horticultural Society, and the Pilot Point Horticultural Society joined the Central Texas Horticultural Society, upon the invitation of the latter, in organizing the Texas State Horticultural Society. In 1889 this society began the publication of its proceedings. In 1890 it announced that the ninth regular meeting of the American Horticultural Society would be held in Texas. The society has grown to be a large and influential body like our own, and at its next annual meeting will undertake the cataloguing of the fruits of Texas.

Throughout the country wherever fruit growing has become an industry of importance, the state horticultural societies have compiled catalogues of the fruits grown, showing by their arrangement and marking the relative adapta-

bility of the various varieties to the several sections, such catalogues being revised every year and published in connection with the reports of the proceedings of the societies. These catalogues form an invaluable guide to the planter and enable even a novice to select with certainty. In this sub-tropical region, where selection is more difficult than elsewhere, because conditions are peculiar and the precedents of other sections are not to be depended upon, such a catalogue would be invaluable. Up to this time neither in Florida, Texas, nor the intervening states, has such a work been issued.

The only information of the kind obtainable is to be found in the magnificent fruit catalogue of the American Pomological society, which includes the fruits of the entire country, but is too general, and covers too wide a range, to include the specific information required in any particular section, and especially in a section like this where fruit culture is comparatively new and developing rapidly.

When the general revision was made of the American Pomological society's catalogue, in 1891, the Sub-Tropical committee of that society submitted tabulated and properly marked lists of the fruits of the Gulf coast sub-tropical region, and, as chairman of that committee, I urged the importance of giving this great section, unique and peculiar in its pomology, a separate and distinct place in the catalogue, but the time-honored custom of listing by states was adhered to, lessening the value of the work for this region, although the revision was, for this section, as elsewhere, as thorough and comprehensive as possible under the restrictions of this rule.

With the sole exception of Florida, the sub-tropical regions, both of the Pacific and the Gulf, are made up of parts of states having little in common, pomologically speaking, with those portions of the same states lying outside. Hence the inapplicability to this region of fruit lists made up with regard to political rather than pomological lines, and the great importance of the work now under way in Texas and Florida.

These two horticultural communities, which have grown up during the past quarter century on opposite sides of the Gulf, and which have so many interests in common, have been, up to this time, practically speaking, strangers. Is it not time for us to get acquainted? What better way of bringing this about than through a joint meeting of the two horticultural societies? Aside from the pleasure such a session would afford its participants, would not the interchange of experience and opinion elicited, especially if published, be of great value to the horticulture of both states? The Texas society will adopt a catalogue at its next meeting; it is proposed to

attempt a similar work at our next meeting—what better time for such a joint session than the year following the cataloguing of the fruits of both states?

At the conclusion of his remarks Mr. Manville offered the following resolution, which was unanimously adopted:

Resolved, That a committee of three be appointed by the president to prepare and present to the Texas State Horticultural society an invitation to meet the Florida State Horticultural society in joint session in the year 1896, and that said committee be empowered to act for the society in the matter of arranging time, place and necessary preliminaries for such joint session in case this invitation is accepted by the Texas society.

---

## Introduction of New Fruits and Plants.

---

At the Pensacola meeting of the Society (April, 1893, see published report), Prof. W. T. Swingle, of the U. S. Sub-Tropical Laboratory at Eustis, Fla., urged that some steps be taken by the Society looking to the introduction of new fruits and plants. In an address of exceptional interest on this subject he pointed out the great gain that had resulted to our horticulture from the very limited importations which had been made, and called attention to the fact that hundreds of varieties and species remained to be introduced, which there was every reason to believe were especially desirable. He introduced his remarks as follows:

"The advances made during recent years in horticulture are largely due to the introduction of new varieties of cultivated plants, or to the improvement of old ones by careful selection and hybridizing. When we consider the great changes the introduction of a single good variety may work in the horticulture of a whole district or state, it seems curious, to say the least, why more effort has not been made to procure all known varieties and test them thoroughly in each region."

After recounting and describing at some length many kinds which it was especially desirable to introduce into Florida, he continued:

"After considerable thought it has seemed most feasible to me to organize a stock company or society for the express purpose of introducing these economic plants. \* \* \* Baron von Muller enumerates 2,485 species of useful plants,

tried in Florida? Very many of the most important subtropical and tropical plants have never been introduced, much less tried here.

"I would suggest, therefore, that the company send a trained agent to various countries and that he collect whatever economic plants he can obtain, as well as citrus fruits and their allies. The plants thus imported could be placed on sale, and would, if judiciously advertised, hardly fail to pay expenses, at the very start, and would certainly be a most profitable investment in the end," etc.

Prof. Swingle explained that the United States Department of Agriculture could not undertake such a work, and concluded as follows:

"Horticulturists of Florida, by what I have said I hope I have succeeded in convincing many of you at least that the inauguration of this move would succeed as a business venture, would eventually place it in the power of every one to grow new and better fruits and other crops, and would, in so doing, place you ahead of all competitors, foreign or domestic. \* \* \* Is it not high time that Florida's horticulturists show their abiding faith and interest in the welfare of themselves and their prosperity by putting into immediate execution some plan for the systematic introduction of economic plants suited to our climate?"

The ideas advanced by Prof. Swingle were favorably received by the Society, and after considerable discussion the following was unanimously passed:

Resolved, That a committee of five be appointed by the President to whom shall be referred that portion of Prof. Swingle's report relating to an organization for the purpose of introducing new varieties. It is expected that this committee will issue a circular letter, calling attention to the importance of the matter, and if it meets with sufficient encouragement the committee is authorized to perfect such organization.

The following committee was appointed: S. S. Harvey, W. T. Swingle, H. S. Williams, G. L. Taber, G. P. Healy.

When the Committee on the Introduction of New Fruits and Plants was called at the Jacksonville meeting, Chairman Harvey said:

"The committee has not been able to make much progress. The times are too hard and dollars too scarce to bring about an investment of this kind. The committee has not thought it a propitious time for such a movement. Your committee asks to be continued. If this be done and the times improve they will take the matter up the coming year."

A motion was unanimously passed that the Committee on

suitable for cultivation in extra-tropical regions. \* \* \* In comparison with these numbers how few plants have been the Introduction of New Fruits and Plants be made one of the Society's regular standing committees, and that its membership be unchanged for another year.

---

## Grape Growing for Profit.

---

Prepared by A. W. Stewart, of Galt, Santa Rosa County, member of Standing Committee on Grapes, and read by George H. Wright, Chairman.

In preparing my Report on Grapes I endeavored to find out the best grapes for this state, so I wrote out a number of questions and sent them to members of our society in different sections of the state. Most of them furnished a prompt reply, showing that they were interested in the success of our society.

I find that the Niagara, Delaware and Ives are the best adapted as market grapes for this state, as they stand shipping well and bring good prices and are a sure crop. I would advise all new beginners to plant these and not waste their money on putting out too many varieties, but confine themselves to the above.

I would recommend the following fertilizers: Ground bone, sulphate of potash and cotton seed meal. Use one-half to three-fourths ton per acre of the mixture. The vines require nitrogen, and this I would give in two applications, one in January, the other the last of May.

I sent out the following question: "Are your vines free of disease?" and most of them replied "yes," while others replied that they were troubled with mildew and that it could be prevented by spraying. I would recommend spraying with Bordeaux mixture.

Most of them report that they received good prices, while others complain of the commission men getting away with them. I would recommend them not to ship to any one unless they know he is honest and makes true returns. Put your grapes up in nice little baskets four to the crate, and they will sell, while those put up in boxes are a drug on the market. Although this fruit may be good it is in no shape to sell. A person will come along and see one of those nice

baskets and it takes his fancy; whereas if he has to wait to have them weighed he won't have them. The four baskets and crate will cost you about 16 cents, and will net you double.

I do not claim that every kind of grape will succeed here, but as many as in any other section.

When you make up your mind to start a vineyard, select a dry place. If not dry it should be made so by drainage. If it is new land rid the ground of all roots and do not allow any piles of brush to decay to feed insects, but burn them and scatter the ashes on the ground. Plow the ground deep and harrow it well. When your ground is ready run your rows ten feet apart, from north to south, if possible. Plant your vines ten feet apart. Dig your holes two feet square by eighteen inches to two feet deep.

Select varieties that will ripen well here. Get good strong 2-year-old vines and see that they have roots on all sides and were not propagated from layers. If so the roots will be all on one side. When planted upright the side on which no roots are formed begins to rot and this gradually extends up the vine and the unnourished side until in three or four years the novice finds he has a vine about at the end of its career, and wonders at his misfortune. This is one cause of so many failures.

We can raise as large and fine grapes as they can north of the same kind. The Delaware grows to perfection, and for a table grape it has no equal. The Niagara is a showy grape and sells well. The Ives is a good shipper and sells well.

Pruning is of vital importance for the production of good fruit. Some claim that it should be done in the last of November or first of December. I cannot agree with them. I would not prune until the buds begin to swell, then you can see all dead and deficient wood and remove it. I have pruned late for the last three years and have had a full crop.

The late freeze did me but little damage; my grapes were not far enough out to be hurt and are fruiting nicely. According to reports, in West Florida those that were out and were killed are setting new fruit and will make a fair crop, but a little late. I am unable to say what damage was done in the eastern and middle part of the state.

It is impossible to lay down any set rule for pruning. Different grapes require different pruning. I would recommend the renewal system.

Grapes need cultivation, and unless you can give it you need not expect to have fine grapes. Cultivate at least once every fifteen days until the middle of June, and with new vines until the middle of September.

## Marketing Grapes.

Prepared and read by Geo. H. Wright, of Chuluota, Orange County,  
Chairman Standing Committee on Grapes.

Grape growing is among the oldest horticultural industries since the creation, and therefore its consideration commands a portion of our time and attention.

Grapes may be seen growing to perfection in nearly all parts of the world ; on hill sides, in the valleys, by the running streams, on the plains, in tropical as well as temperate zones, not a civilized country but what they are grown to a greater or less extent. Yet, how few of us understand the requirements of the vine.

Different species require different treatment and soil. Some varieties require a sandy soil, others clay, marl or muck, and the planter that plants his vines without a due regard to the requirements of variety, soil, etc., will not meet with success.

Seven years ago the planting of the grape began quite largely in South Florida. A large acreage was planted, mostly to White Niagara, and up to last year there were 500 acres in Orange county alone, and at least half that amount in adjoining counties.

When the spring of '93 opened the grape growers were very sanguine that a large crop would bless their efforts and remunerative prices be received.

The first shipments to Philadelphia and New York brought good returns ; all subsequent shipments failed.

The best of packing and handling by the grower came to naught. Word came back, "grapes received in bad condition." Why was this ? The growers were obliged to ship by express ; no refrigerator service could be secured ; express car was hot during the day but cool at night, the same thing the second and third day and the result was death to the business.

This year not over one-half of the vineyards are being worked, and lack of remunerative prices is the cause. To make viticulture pay in Florida one of two things must be done : there must be first-class, rapid refrigerator service at reasonable rates, or the grapes must be manufactured into wine.

From personal observation and experience in the field I have come to the following conclusions : "Plant fewer Niag-

ara vines, and on our sandy soil more Herbemont, Norton's Virginia and Cynthiana; plant on higher land than has been previously recommended; use as a fertilizer plenty of ammonia, phosphoric acid and sulphate of potash; work vineyards using clean culture up to June 1. In South Florida we must trust to express and transportation companies to give us better service or we must go out of the business." These conclusions are drawn from a state where a large variety of grapes grow to perfection.

---

## Discussion on Grapes.

---

**Mr. GEO. H. WRIGHT**—I wish to state that Mr. H. P. Hand, of Daytona, was the third member of this Committee on Grapes. Mr. Stewart wrote me that he was an amateur in grape growing. I replied that it was the amateur, as a rule, that brought out new thoughts and new ideas, not only in grape growing but in all planting. I regret that Mr. Stewart is not here.

**Mr. H. S. WILLIAMS**—The paper read by Mr. Wright does not show a very glowing future for grapes in South Florida. I should like to hear from Mr. Mellish on this subject.

**Mr. G. W. MELLISH**—I do not know that I have anything new to offer. I presume we have some advantages in West Florida over South Florida growers. We are within twenty-four hours of Cincinnati and thirty-six of Chicago, and our Niagara grapes have been shipped to both points without any report of bad condition when received. We grow our grapes, at least most of us, on high sandy soil, thoroughly well drained, naturally. One small vineyard was planted in our section on soil where the clay was within possibly a foot of the surface and in going by the vineyard one evening the owner called me and shook the grape vine, causing the grapes to fall to the ground. I told him to come up to my place and see my grapes. He did come and I took him out to the vineyard and shook the vines, but they did not fall. I do not know the reason of it except that it may have been caused by the wet weather and poorly drained soil. I had used potash and that may have had something to do with it, but I do not know. I certainly should not expect profitable returns from grapes grown on heavy soil, unless thoroughly drained. The

water must work off above the clay, and if it cannot get off soon enough the ground becomes so saturated with water that the grapes drop from the stem and those that remain are not of good quality. Grapes should be planted on high soil. On my place I have found no foundation except sand. Our express rates are probably not so exorbitant as in South Florida. They are high enough, but our returns bring us a profit, as much, perhaps, as is derived from any line of fruit growing, although grape growing requires more attention than peach growing in our vicinity. I have always had an idea that the trouble in South Florida was that the grapes were planted in ground not well enough drained.

Mr. W. A. COOPER—I would like to ask Mr. Wright to explain about the carload of grapes he went to Chicago with from Orlando, and about the condition the grapes were in that came from St. Augustine at about the same time. I read in a paper published at Avon Park about the grapes raised round St. Augustine and Moultrie, and how very profitable they are. I would like to have Mr. Wright say in what condition he found them.

Mr. WRIGHT—I do not like the idea of criticising the business methods of any one, especially of those in a business that is parallel with my own; yet, in answering the gentleman's question I will be obliged to do it.

These glowing statements are not confined to the paper to which Captain Cooper refers. Only last week one of our evening papers criticised the knowledge of the growers of Orange county and spoke very highly of the experience of those in St. Johns county. (Mr. Wright is from Orange county.)

I think it was on the 29th of last June I left Orlando with a car load of grapes for Chicago. The car was iced the day we loaded in Orlando and went out the same night. At Baldwin it laid over twelve hours and was five days on the road. One of the ventilators of the car was open. On the morning of the 5th of July I opened the car and put the grapes on the market, and fixed the price at which they should be sold. I sold about 100 crates that day at an average of \$2.50 to \$5 per crate of 24 and 40 pounds. That night a car load came in from Moultrie by express, containing between 100 and 200 crates. These were put up at auction and sold at an average of \$1.20 to \$1.40 a crate.

They were not as fine grapes as ours. There were no covers on the baskets below the top tier, and the baskets were not quite full. Of course this cut prices, but only a little. The next evening there was another car load and the following evening another. The prices of those grapes run down to 40

to 60 cents. I didn't sell a crate of our grapes for less than \$1.20. The difference in the condition in which they arrived was due more to the method of shipping than anything else. We have had discussions at various times in our society in regard to leaving some circulation of air in the car. I objected to it, thinking it would be damaging to the grapes. In the carload I went to Chicago with the grapes in the end of the car in which the ventilator was open were not as good as those in another part of the car.

In regard to the failure of some of the vineyards in Orange county and in South Florida, (and I want to say right here that I grew grapes thirty years ago in New York, I have seen grapes growing in Missouri, Colorado and California, and I have seen grapes growing on the Rhine, in different localities, and I think I know something about grape growing.) I believe the failure to-day to grow grapes profitably, lies in the plan by which we are forced to get them to market. I know of one vineyard of 170 acres, all Niagaras, of which the owners are very sanguine of successful returns, but they are making arrangements for refrigerator service to market their crops. In the first place, we must cool down the car before putting grapes in. They must lie in refrigeration twenty-four hours before they are loaded. By that means we get the grapes all cooled through before they move, and then if they can go right through in the express trains, or if fast freight service can be secured, I venture to say that grape growing in South Florida can be made as profitable and as remunerative as in any other portion of the state.

As a rule we must plant our grapes, especially the Niagara, on higher ground. I have gone into nearly every vineyard in Orange county with a view of seeing what could be done with grape growing in South Florida, and I say in the paper I have read it is the method in which they are put into the market that causes the unprofitableness of the undertaking. The grapes are put into hot express cars, piled in indiscriminately, and some growers only half pack them, taking no pains, and of course they do not get through in good condition. Our grapes went through to Chicago in better condition than any I saw from other points. I went to the auction and examined the grapes, and those from other points did not come up to the standard of ours. I also saw in Chicago some grapes from about Tallahassee that went into Chicago in very poor condition indeed, although twenty-four hours nearer that market than we are. Anyone who will take a carload of grapes and run them through to Chicago, New York, Baltimore or Boston on the plan that I have outlined, will find they will be in perfect condition on arrival at their destination.

I have had some correspondence with a gentleman handling strawberries about Gainesville. He has a patent of his own get up in a cold storage box that he puts in a car—a common freight car; he lets his car remain and cool twenty-four hours. After cooling it perfectly and thoroughly he puts in his fruit and it goes to New York and the Northern markets in perfect condition. He said he handled grapes in the same way and had no difficulty whatever. From my observation on my trip to Chicago last June, from what I have seen of grape marketing in other ways, and from experience of our method of shipping for two years now in express cars, I have come to the conclusion that this is the difficulty and about the only one. Grapes in our hot climate ripen when the weather is hot and moist, and we must have some means of cooling the grapes down before they are started in transit, else they will rot on the way. I do not believe to-day that there is an investment that a man can go into, if he understands the business, which would be more paying than grape growing, if the right kind of transportation can be obtained to put the grapes in the Northern markets. We could not get refrigerator cars for love or money; at least, that has been the experience of the past. We must have a fast, reliable refrigerator service or make our grapes into wine.

Mr. G. P. HEALY—I would like to ask a question. Do you find that you get remunerative prices for the grapes that go through in good order?

Mr. WRIGHT—Yes, sir; this has been my experience and it cannot be otherwise. If the grapes reach the markets in good condition you will get good prices. I want to say one thing. I do not ship white grapes to Chicago. You can send them to Philadelphia, New York or Boston and get good prices. I have had my grapes bring me thirty cents a pound in New York and Boston.

Mr. HEALY—I would like to ask if that was last year.

Mr. WRIGHT—Last year I got twenty-two cents for the first shipments that went through and they were not thoroughly ripe.

Mr. HEALY—I would like to ask Mr. Wright if it is a fact that all of the grapes of South Florida that went into the Northern markets in good condition sold at paying prices.

Mr. WRIGHT—As far as I know they did.

Mr. HEALY—What were the prices?

Mr. WRIGHT—Eight to ten cents per pound. I can grow grapes in Florida as cheap as I can in New York state.

Mr. HEALY—I sent my grapes to the Northern markets. They went through in good order; I did not have any reported in bad order. They went there in good time and they

did not go through the Grape Growers' association, and I got what would be considered for an orange grower about three and a half cents a box. I do not think they paid over that. You pay the express company four cents and you pay four cents for cultivation, packing, etc., and then sell for ten cents a pound. I cannot for the life of me see where the profit comes in. I failed to find a dollar in it. I agree with Mr. Mellish that the grapes on the high lands are the grapes that will stay on the stems. If any man is paying four cents a pound to transport his grapes, and four cents more to have them picked, and carried to his packing house and taken on board the car, he can do more than I can if he makes anything out of the grapes. At these prices I do not believe he can do it. This great hue and cry they are raising at St. Augustine about grapes is misleading. It is going to carry people into the business and they are going to get hurt when they go into that business. I got hurt, and got hurt badly, and a surgical operation could not put me on my feet. I met Mr. Terry at St. Augustine; he then had sent off two carloads and had one at the depot. They were badly packed. They were not as good as the South Florida grapes. He had not received any returns, but that night, at the hotel, he received a telegram stating that they had been received in bad order, and he stopped shipping. He is now going into making wine. Now, the objection I make to all this is that we are going to lead some poor fellow into this business to put his last dollar where I put mine. Look at the ridiculous position! To invite the horticulturists of Florida to go into the grape growing business! It is a mistake to induce the horticulturists of Florida to go into something out of which they will not get a dollar. The institution at Lockport (Niagara Grape Company) got all the loose change I had, and I do not want anybody else to go the road that I have gone. Look at my vineyard and look at my bank account.

Mr. COOPER—I was crippled a little in the grape business. I swallowed a bait on the grape question. I got Col. Bailey to look at my ground. He said it was a splendid place for grapes. I put out about eight acres. Last year I shipped some grapes and my profit was two 2-cent stamps. I have framed those stamps and have them hanging in my office. I have plowed all my grape vines up. I tried to give the vines away but nobody would take them. For goodness sake never say grapes to me again.

Mr. HEALY—The matter of associations has come to my mind. Where I marketed most of my grapes I was obliged to ship to an association house. I was guaranteed 8 percent. commission, but was charged 12 per cent. If I had been

charged 10 per cent. I would have had 2 per cent. left. I had taken so much medicine I thought I could take some more. I am just as much opposed to associations as I am to grape growing.

Mr. MOTT—I would like to ask Mr. Cooper if he ever raised a bunch of grapes in his vineyard all the berries of which were good enough to eat.

Mr. COOPER—Certainly, I have, especially on that portion of my place called the “Camden Place.” I have raised as fine grapes there as you ever saw. The vines are very vigorous.

Mr. MOTT—I have thought we could raise good grapes in Florida, and I think so yet, but we have got to import the man to raise them. The men who have been raising grapes around Orlando cannot do it. They have picked out the land that has been under water; land that it was never intended should be planted with grapes. They have cleared out the swamps and planted, and I am not surprised at the failures we have heard of and are hearing of. They planted grapes on land that nothing else would grow on. A gentleman at Haines City by the name of Dodson has four acres in grapes and he told me that his grapes were perfect last year, and that he shipped them and got good prices for them, and that they were all gone before he began to ship from around Orlando.

Mr. WRIGHT—I think you will admit that I have not made a very flowery report to-night. I did not propose to make one that would lead people into the grape-growing business until they knew what they wanted. It is a fact that the finest grapes I have ever seen growing east of the Rocky Mountains were those I have seen grown in South Florida.

There were a great many men who grew grapes around Orlando a few years ago who did not understand the proper mode of spraying the grapes and the result was mildew got away with a good many of them. I have used a mixture I consider quite efficient. Making and applying this mixture is a nice job. You put the sulphate of copper on the lime after it is all dissolved, and you ruin it, but if you put the lime on the copper it is all right. You have to use the mixture as a preventive, not as a cure, and then you can make as perfect grapes in South Florida as you can in Missouri, in New York or anywhere. I have not made a favorable report, but at the same time I do not want to say that there is any difficulty in growing first class grapes in South Florida, but the main trouble is in getting them to market. You want to get them there in first-class condition, and the returns will be satisfactory. When the question of transportation is solved

everything is all right, as far as I can see. I can then grow grapes and make money out of them. I do not advise any man to go into grape growing unless he has circumstances, varieties, soils, etc., in his favor.

LYMAN PHELPS—About sixteen years ago, after having been brought up in the grape region of Central New York, I undertook to grow grapes in Orange county. I tried it about four years in a small way. I spent a thousand dollars and received nothing for my efforts. I got nothing back.

W. H. MANN—I gathered a box of white grapes last year in July, and kept those grapes for two weeks and they kept good and sound. I think something might be made out of grape growing in South Florida.

R. W. PIERCE—Where can grapes be grown if not in Florida? I was in California last year and I saw the Chinamen there taking the vines through the streets for fire wood. This did not seem to me to prove that grapes were so very profitable there.

Replying to a number of questions, Mr. Wright said: As fine grapes as I ever saw in my life, and I have seen a great many, I have grown in South Florida. I use a fertilizer with plenty of ammonia, some phosphoric acid and a little potash, one-half pound to the vine, annually. Forty pounds of grapes to the vine a little over three years old is what I have produced in my vineyard. In South Florida the vineyards are worked with clean culture up to June 1st.

I believe that on most of our flat lands in South Florida the Niagara will be short-lived. I have a row of the Duchess, and they are very productive. There are several objections to this variety. One is they are too productive. You have to thin them out or reduce the quantity by short pruning. Again, as they begin to ripen they begin to shed. The Cynthiana, Herbemont and Norton's Virginia all do well enough on high land. The Herbemont and Cynthiana succeed better in South Florida than they do in the Tallahassee region, and there is no reason why these grapes should not be grown profitably if, as I said, the proper means of transportation can be secured.

I want to say a word in regard to a gentleman who is growing grapes near Winter Park. He has foreign varieties as well as American varieties, but he believes as I do that he will have to put the white grapes into wine.

---

## Pineapples.

The Committee on Tropical Fruits presenting no report when this topic was reached, the President said :

This afternoon I had the pleasure of meeting Mr. Thomas E. Richards of Eden, called the "Pineapple King of Florida." No doubt the society would like to hear from him.

Mr. RICHARDS—I suppose I am appointed to represent the poor "king." I was not brought up to make speeches. Fourteen years ago I came from Little Jersey to the Indian River country and went to growing pines. I have made considerable success at it. Unlike the Niagara grape growers we do get some returns from our fruit. I have been growing pineapples for fourteen years, and I think it is a better industry to-day than it was fourteen years ago, and the prospects are that it will continue to be better. We have been handicapped by lack of proper transportation. Our fruit would break down in transit, but at the present time we have very good facilities for shipping, and we can let our fruit get thoroughly ripe before shipping to New York and the eastern markets. We get better prices than formerly. I think there is room for others in the industry. If you are going to give up grapes come down and try pineapples.

The PRESIDENT—There are a good many of us who want pineapples, not particularly to compete with your market, but for home market.

Mr. RICHARDS—in that case I think the best way would be to send down our way for them. It is quite a story to tell the whole mode of cultivation of the pine. I do not think I would like to take up that much time.

C. F. A. BIELBY—Mr. Richards, this is just what we all want to know.

Mr. RICHARDS—You will find that you cannot plant the pineapple where there is any frost, yet we do not claim to be below the frost line. Poor scrub land with plenty of spruce pine on it is good enough for pineapple growing. That is the kind of land our fruit is planted upon principally.

H. S. WILLIAMS—Tell us something about the varieties you are growing.

Mr. RICHARDS—We plant the Spanish pine, the Strawberry

pine and the Egyptian Queen. These are the best and most successful. The other varieties are troubled by the red spider and are not so successful. We plant from ten to sixteen thousand plants to the acre. It costs in the neighborhood of \$300 to grub the land and get it in condition, set out the plants, pay for them, take care of them and fertilize them until they fruit, which takes about two years. I refer to the Strawberry and Spanish pines. The first year about 90 per cent. of the plants fruit, and the second year we get about two pines for each plant set. If the fruit is well fertilized and cared for it will average about sixty to the crate. Last year I realized about \$4.50 per crate, net. If you want to go into the business come down into our country.

A. H. MARTIN—Something has been said about the grape being planted in the swamps and I know that pineapples are planted in the swamps. What kind of land should pines have, Mr. Richards?

Mr. RICHARDS—Pretty good sand. They will not grow in swamp land and they do not want any water. The pineapple is built for a dry country, and if you will notice the plant you will see the peculiar formation of the leaves or stems, which seem to be made to catch and absorb moisture from the atmosphere. They get plenty of dew and do not need much rain. If you will examine a growing pineapple early in the morning you will find that the leaves are full of water.

Mr. WILLIAMS—I remember as far back as 1874, when the first pineapple in our section bloomed, it was a great curiosity; people came for fifty miles to see that pineapple growing; that was the first effort to grow the fruit in that section, and it is wonderful what strides have been made. I took a trip to Lake Worth last summer and stopped at Mr. Richards' place. The varieties I grew were the Red Spanish, and up to 1886 I made quite a success of growing pines. I had a home market for all I could grow, and I had a compliment paid me by a lady who said that my fruit was the first she had ever eat without sugar. The freeze of 1886 gave pineapple culture at Rockledge a black eye from which it has not recovered, but the lands about Jensen, Eden and St. Lucie are to-day as valuable as any lands in the state of Florida, and as Mr. Richards says, the lands there that produce the spruce pine have been found the best for pineapples. The pineapples growing around Jensen were a picture to look at. On level ground you could see acre after acre, and I consider that that industry is going to be the most profitable of any industry in the state. There is one objection to the Indian River country ; there are too many mosquitoes.

Mr. PHELPS—Mr. Richards, does the Abakka pine grow in your section successfully?

Mr. RICHARDS—It does very well. We grow plenty of them, but we never try to ship them to Northern markets.

Mr. PHELPS—I never got so much off a small space as I did off pineapples, but in 1886 I went to pieces on pineapples and have never tried them since. There is no question that a heavy frost will play havoc with and will ruin a pineapple plantation. There is another quality of the pineapple and a very important one, which should not be lost sight of. Years ago I used the pine as part of my food. I thrived on it. It is readily and easily assimilated. One of the best known chemical companies in the United States to-day has begun to put up a plant in Mexico which will cost thousands of dollars to grow pines simply for the use that can be made of them in medicine and to produce a free digesting food that can be taken up into the blood without any action of the stomach. I investigated thoroughly the properties of the pineapple some years ago, and I can say that this fruit is next to fresh beef in nutritive qualities. This chemical company has selected Mexico for its plant as being more of an even climate. They are going to put up food that will make lean people fat in a very short time. It is easily digested and is preferable to fresh meat. It is in the form of a syrup. The industry is in its infancy. I look forward to more results from the pine in that direction than I do to the pine being consumed at the table.

O. P. ROOKS—I have a neighbor who claims that he has had dyspepsia for twenty years, and there is no food or fruit that he can eat with as much relish as the pineapple. He states that when the pineapple season is on he has no disturbances from his complaint because he then eats the pine. I have been raising pines for fifteen years. Even the freeze of 1886 did not break me up. My place is four miles from Leesburg. I gathered two elegant pines this morning. We have twenty varieties and they all seem to be doing fairly well. The large varieties do not seem to do as well as the Queen. We plant under protection. We put up a rough shed and cover that with pine straw as a protection against frost. Pine straw that is used during the winter can be put round fruit trees. Wherever the pineapples have been planted our trees are doing much better than elsewhere. I have doubled the crop of fruit where the pineapples have been planted. There is one idea that Mr. Richards advances and that is that sand is absolutely necessary. My land has a clay sub-soil from two to six feet down and the pines do well. I have raised pineapples

weighing ten pounds, and this fruit has been as profitable as anything I have ever raised on my place, I believe that in our section of the country (Lake county) every farmer and grower should have a patch of pineapples for his own use. When it is thoroughly ripe it is a delicious fruit, as much so as any that can be had. These pineapples that we pick green and ship are not of a very fine flavor when they do ripen. People do not like the taste of them. People are going into pines extensively and there seems to be a great deal of trouble in getting slips. A gentleman told me to day that he had 150 acres under cultivation, and he was thinking of putting out all of it in pineapples. The matter of transportation facilities is also a troublesome question. Mr. Plant has opened up a steamship line to the tropical regions, Jamaica and the south, and in view of the competition from the West Indies, I do not know where we will be after awhile. Unless transportation matters improve I am afraid we will be run out of the business.

Mr. PHELPS—It is not well to cross bridges before we get to them. I have great faith in what Mr. Flagler says and he says he is going to build further down into the state. Referring again to the medicinal qualities of the pineapple: I think the time has come for us to realize that there is nothing so eloquent as the truth, and the simple truth should be told of the climate of Florida. I came to this state as an invalid. I respect the state. I have been sick in the last eighteen months, and I have been told again and again that I would not live long, but I am living and strong to-day. There are plants that grow in Florida that will cure almost any disease. You should all understand what your systems need. After going through a very trying year and not knowing what made me sick, I am up again and on my feet and ready to work, almost. I say to you that the pineapple and the fig are pre-eminently the food for this climate. Those two things are worth more as food than anything else, but they want to be ripe fruit, not green. Unripe fruit is not good for the stomach and the acid of such fruit is irritating. The acid of ripe fruits is all healthful. No food or fruit is equal to the pineapple. I do not think we can raise pines where there is frost in the air to compete with the lower part of the state. I have kept a record for forty years and it is very interesting to me to study the records of the barometer and the thermometer, and I have learned a great many things from this systematic study. The question of Orlando has been brought up. I have resided in Orange county twenty years. There are places near that town where pineapples have been planted and grow so luxuriously that in going through the country in my buggy

I have had to stand on the seat. I have never advised any man to invest one dollar in Florida until he came to look at it and get advice from the men in the community in which he desired to locate. I say that I have more than made a living in the state by my efforts, and I propose to stick to it.

Mr. RICHARDS—I have been asked how long a pineapple plantation would stand. I must say I have not been in the business long enough to know. I have been at it fourteen years and I have plants growing yet and they do better to-day than they did five years ago. All that is necessary is attention and plenty of fertilizer to make them last an indefinite period. Use phosphate (Florida soft phosphate ground and dried,) potash (derived from kainit and cotton seed meal); that makes a complete fertilizer. My pineapple plants bear all the year. I have shipped a good many in the winter. The new ones come on in the summer. We plant about 16,000 to the acre. When the plants are two years old we get from 200 to 300 per cent. and we get less after that.

Speaking of the pineapple being a good medicine for indigestion, I found out long ago that the pineapple was a good medicine, and when I came to Florida I was a dyspeptic, but I am not now. When I can get a good ripe pineapple to eat I do not have indigestion.

Mr. ROOKS—if I understand correctly the captain states he plants 16,000 pineapple plants to the acre; the first year they will average 60 per cent. in fruit; the second year from 200 to 300 per cent. Do I understand that in the second year they will produce from thirty to forty thousand apples to the acre?

Mr. RICHARDS—The first year they produce 90 per cent. and the second year they will produce 300 per cent.

Mr. ROOKS—You plant 16,000 plants to the acre?

Mr. RICHARDS—Yes, sir.

Mr. ROOKS—That is 45,000 apples the second year. I cannot raise it on my ground.

Mr. RICHARDS—Some of my plants have five to six apples on them.

Mr. ROOKS—I could never do that. I would like to ask Mr. Martin if he is acquainted with the character of the land that Mr. Russell has.

Mr. MARTIN—It is dry land.

Mr. ROOKS—I remember visiting his place once, but it appeared to me that the land was swampy.

Mr. MARTIN—His place was on wet land. It has been thoroughly drained. It is rich, good land.

Mr. ROOKS—I would like to know the best kind of fertilizer to use. I have used fertilizers that are prepared for the orange trees on my pineapples. It has a wonderful effect on my orange trees and on the oranges. My pines are planted about two to three feet apart. All the plants I got from the Indian River country had the mealy bugs. Something destroyed them; I do not know what. I have none now. I do not know what the cure was.

Mr. RICHARDS—The fertilizer I mentioned is the best. I do not know what killed out your mealy bugs. We are not troubled by them.

G. P. HEALY—I would like to ask Mr. Richards if he has any difficulty with the stem rot in his pines.

Mr. RICHARDS—The stem rot is caused by the red spider. The spider works round the root of the plant and causes them to rot off. I do not know what the remedy is. I have no red spiders because I do not plant the varieties they infest.

---

## The Kaki--Japan Persimmon.

---

The Committee on Kaki submitting no report, the subject was taken up and discussed as follows:

C. F. A. BIELBY—I think almost every one present has an interest in this subject, and it would be gratifying to everyone here to hear from those who have raised Japan persimmons and of their successes. There is no question about the possibilities of raising the fruit, nor is there question about the quality of it, but how to prepare it so that in getting it to market it may be presented sound and whole and induce the people of the consuming portion of the country to purchase it, is the only question we have much interest in. I shipped quite a large quantity last year, and every box I was able to put in the market sound, sold for a very good price; but unfortunately I do not seem to have the knack of putting it up so that it will go to the market in good shape. Pack it ever so green, or as ripe as I might, it would always reach the markets in bad order. On the whole the shipments were disastrous. If anybody here knows how to ship it so that the

fruit will arrive at market in good order, we will be pleased to hear from him.

C. A. HASENYAGER—I shipped some last year. I wrapped them and packed them in half boxes, the same as we use for oranges, and they sold in Philadelphia for \$3.75 per box. I picked them some time after Christmas, but the early ones I have not succeeded in marketing yet. They were very hard, and I kept some of the fruit three weeks before it was fit to eat. I wrote small cards and cautioned the dealer that they must be kept until they were soft before they were ready for the consumer. They sold well.

S. S. HARVEY—I have made an effort to raise a small grove, having just lately become interested in the fruit. I have set out about three acres. I have raised a few trees. I shipped some fruit to Chicago last year. They would ship round the world. As the gentleman has just said it takes two weeks for them to get fit to eat. The difficulty I found in the first shipments was that nobody knew how to eat them or when to eat them, but they are learning rapidly in the western cities. There is quite a difference this year. I shipped my fruit in the Sinclair boxes. They went to Chicago in good condition and they brought me an average of  $2\frac{1}{2}$  to  $2\frac{3}{4}$  cents apiece. I had one tree with 185 fruits one year, another 235. The trees were about four years old, possibly five, but there was not the slightest difficulty about shipping and reaching the market in fine condition. I think that if we make a success of this fruit it will be necessary to print a slip giving directions in regard to using it, and put in each box shipped, certainly for a year. My commission man in Chicago tells me that the fruit men buy them to ornament their stalls. From my sales last year I was encouraged to plant, and I think it will be a good paying fruit. I had a difficulty in growing the trees, as I found there was some insect that attacked the leaves and curled them up. I used a solution of tobacco and got rid of the insects and have had no trouble about the curling of leaves since.

G. P. HEALY—I would like to ask the gentleman how many are consumed in ornamenting?

Mr. HARVEY—I do not think that is a matter of any moment. I think the consumers are rapidly learning to know the fruit. My commission man informed me that they readily sold in the California market in 20-pound peach boxes last season for \$3.50 to \$3.75.

T. K. GODBEY—I have been growing the persimmon for about seven years. I had, I think, the first fruit planted in the state. I now have about 500 trees. I have never had

any trouble in shipping them. I have only shipped a few. I have found a good market near home. Sometimes, though, I overstock the home market. Last year I did not have a very large crop and about the first of November I shipped a box (what would be an orange box) with my first shipment of oranges to Chattanooga, Tenn. They were 15 days on the road. They arrived in Tennessee and sold for \$2, net. That is what was equal to an orange box. I have shipped them to New York and got \$3, net, about as well as I have ever done. The trees are very prolific with me, but I find this trouble: They are liable to be damaged by late frosts and if the tree is the least bit damaged the worms will get into it and kill it. When the tree gets old the worms will also get into it. You can depend on a tree living only a little while—not more than three or four crops will be produced. There is one worm that gets in at the roots, but the others get in through the bark, and they kill the tree. I have decided that in a commercial way the Japan persimmon will not do to depend upon. I have made some money out of them but do not set much store by them. I am afraid to trust them. It is true that the stump will always sprout up and you can regraft that and get another tree in a short while, but that will also die. My first trees were set out twelve years ago and they have gone down three times to the stumps. The bulk are only five or six years old and many are badly affected with the worms.

C. A. BACON—I have a few of the persimmon trees and what I have have been very successful. I have three varieties. The best is acorn-shaped and very large. Some of that variety have weighed a pound. They are very fine. I am not acquainted with the insect that gets into the root. I have used kerosene for killing the borer, both in peach and persimmon trees. At Holly Hill Mr. Harris went into the persimmon business quite extensively. The last conversation I had with him was two years ago. He said then that the twig-borer and the wood-pecker would ruin the fruit. I should be sorry to have this fruit cried down. It is the most perfect fruit, I think, grown on the face of the earth. It is a delicious fruit and "fit for the gods."

LYMAN PHELPS—The gentleman gave the name of the fruit when he said it was "fit for the gods." The fruit is no more liable to the attacks of insects than any other trees that grow. I have a persimmon tree that has been fruiting for me for twelve or thirteen years. Last year I picked off fruit equal in quantity to ten boxes of oranges, and it is quite healthy still. I do not know much about Japan persimmons. I got some new varieties year before last from California that

came direct from Japan. The fruit is not as difficult to grow as peaches.

A. G. AVERY—I have eaten as many as six varieties of this fruit and they are of different taste and flavor. The fruit wants to be kept from moisture. It should not be exposed to dampness, and if it is placed in a dry place it keeps a long while; it will keep for five weeks. It is not really nice until it gets very soft. There is no fruit equal to it, in my estimation.

H. W. MARSH—I can only raise one crop of persimmons a year, but there are three crops of blackbirds, and all want a bite of each persimmon.

W. H. H. HOLDRIDGE—I have raised persimmons, and I have found them very fine fruit, indeed, and I have had no trouble with my trees until the March frost of four years ago. Perhaps the fruit-growers remember that year. We did not have a show of frost from November to March, but in March we had a killing frost. Ever since my trees have been behaving just like Mr. Godbey's. I have found them occasionally rotting. I have been watching other things more closely than these trees.

Mr. GODBEY—As to the size of persimmons I have had the fruit of the Hyakume variety weigh twenty ounces. In this respect we could not ask any more. As to the quality of the fruit, as a gentleman has said, "it is fit for the gods," if they ever eat anything. The worm getting into the bark is a very serious matter, and it might be a good idea to look and go slow, and be sure what you are doing.

O. P. ROOKS—It has been suggested that a fruit should not be denounced because it proves a failure in one locality. One of the speakers seems to think that the trouble Mr. Godbey meets is caused by frost, and I think the gentleman himself believes so. I have never had my trees injured in that way. I have never noticed any worms. We have trees that are twelve years old, bearing good and successful crops. I think I have ten varieties. I think the fine variety that Mr. Bacon referred to as being acorn-shaped is the Tane-Nashi. I sent specimens to Washington nine years ago and they were figured in the bulletins, and I think they called them the Tane-Nashi. They are certainly fine fruit, and I have grown them weighing a pound. They are among the most profitable fruits we have, meaty and good shippers.

Prof. P. H. ROLFS—In reference to the sawyer: They are very thick where there are hickories. They might be prevented from attacking the persimmon trees by protecting

them from the hickories. While we have varieties of hickories we are liable to have sawyers.

G. H. WRIGHT—I have been growing persimmons for seven or eight years, and have had no difficulty in growing them. There are lots of mocking birds usually around them. These birds seem to be fond of the fruit. Recently I found on two trees of mine a scale new to me. I brought some twigs and passed them over to Prof. Weber and asked him to see what they were and tell me. They multiply rapidly and I do not know but what it is possible that the scale might in the future cut quite a figure in the industry.

Mr. ROOKS—In the last two years the twig borer has been very numerous in the willow oaks around my place. I can gather them by the wagon load around there. I have several ornamental trees they are trimming for me and they have nearly destroyed the beauty of these trees. I always gather the wood I cut off and burn it.

Prof. WEBER—in regard to the scale mentioned, it is one of the soft shell scales, and I do not think it is going to be a serious thing, and it is quite easy to destroy them with any of the scale insecticides.

---

## Peaches and Plums.

---

Paper prepared and read by Col. S. S. Harvey, of Molino, Escambia County, Chairman of the Standing Committee on Peaches and Plums.

Before reading his paper, Mr. Harvey said :

Two gentlemen were appointed with me on this committee whom I have not seen, and with whom I have had no correspondence. I have never met these gentlemen. What I have to say, therefore, as to cultivation and varieties applies to my own section of the State—West Florida.

As one of your committee, I will confine my portion of the report on peaches and plums to the section in which my orchard is located, that is Western Florida. I had hoped to be able to make a trip over the State, investigating the peach and plum culture, so that I could make a report that would be of value to those cultivating, or intending to cultivate

these reports. I regret to report that I was unable to do so. I did visit a few points in West Florida examining orchards.

And here I hope to be excused for saying a good word for a railroad company. When I contemplated a trip examining orchards, I invited Mr. G. L. Taber to make the trip with me, being anxious to have his pomological knowledge. With the idea of making the personal expense less, I addressed a letter to the division passenger agent of the L. & N. railroad, stating the object of the trip and asking the company for passes over their road, in view of the fact that a report would benefit the fruit business, and incidentally the company. I received a prompt answer from Mr. Lurton, the division passenger agent of the L. & N. company, with passes over their line in Florida (204 miles) both ways, good to stop at any and all stations, for Mr. Taber and myself. Owing to sickness in Mr. Taber's family, the trip was not made. But the action of the company deserves this acknowledgment.

#### A GOOD RAILROAD SERVICE.

In this connection I will digress to state that for several years I have shipped fruit by the L. & N. railway, my orchard being on their line, and the only road I ship over in Florida, and I have invariably received good attention and fair treatment from officers and employes. Last year I shipped several carloads and numerous smaller shipments, and while I think the charges entirely too much, the service was first-class. Ventilated cars were promptly furnished and promptly taken away when loaded, and, better still, promptly delivered at destination. Through the courtesy of Mr. Saltmarsh, the division superintendent, I knew where my cars were, from point to point, when I asked for it.

#### TRANSPORTATION CHARGES.

I say I think the charges too much. I suppose we would think that if they were much less. But let us be just, if possible. The fault of excessive freight rates does not lie at the door of the railroad officials that we come in contact with. They are simply trying (and failing often) to make expenses and pay interest on invested capital and water added by grace of legislative bodies. We have tried Railroad Commissions, National and State, and failed. What next?

Some gentlemen of this Society may think all of this out of place in a report on peaches and plums, but I am trying to produce fruit in Chicago, New York, and where my customers are, and I find transportation a very considerable part of the work.

#### SUITABLE VARIETIES.

The greatest difficulty about successful peach and plum

culture is varieties suitable for the locality. That is important information that Experiment Stations should promptly furnish, but they do not. For an illustration, the earliest variety of peach we know of is the Peen-to. In the center of the Peninsula and South that peach may be a success, but it is entirely worthless in Northern Florida, the reason being that it blooms too early for any section that has late frosts.

#### TIME OF BLOOMING.

I have been forced to consider a feature of peach culture that I have never found in any book or catalogue, namely, When does it bloom? It is a question I have never seen answered by any one trying to sell trees. It is a far more important question than when it ripens its fruit, and it is one that I recommend all intending planters of peach trees to have answered before they purchase. If the variety blooms before the time that you may reasonably expect the last cold spell in your locality, do not touch it. It will shorten your life, and worry what you do have, to see, year after year, your peach trees become loaded with young peaches, only to be made mush of by a late cold spell. If some of my nursery friends, or catalogue fiends, had given me information on this point when I commenced planting trees, some nine years since, it would have saved me thousands of dollars and much vexation of spirit; and not only myself, but my poor, suffering neighbors, as they followed in my footsteps and set out acres of crazy trees that do not sleep until spring comes.

#### LATE BLOOMING DESIRABLE.

A peculiar thing I have discovered only by experience is that it is not necessary to look for a variety that blooms early to get early peaches.

#### WALDO AND ALEXANDER COMPARED.

Take the Waldo and the Alexander, and this year's experience: The Waldo commenced to bloom 3d to 5th of February, at the time of the late cold snap, March 27th, the fruit was nearly half grown; all lost. The Alexander had not opened any bloom March 27th, and is about in full bloom to-day, April 7th. Now if the Waldo had not lost its fruit, it and the Alexander would have matured their fruit at the same time, about the last of May. Each will sell the same in market. With this very great disadvantage of early blooming, the Waldo and all seedlings of the Peen-to, have one advantage over any Persian variety that I have tried, and that is, the Chinese are decidedly the best woodmakers. But all that beautiful wood is nothing, if those varieties put on fruit each year only to be frozen by the late cold.

#### FOUR BEST VARIETIES FOR WEST FLORIDA.

If I wanted to set out ten acres in peaches now, I would

put in two acres Jesse Kerr, two acres Alexander, two acres General Lee, and four acres Elberta.

As a money producer, there is no peach so far tried in West Florida equal to the Elberta. It ripens July 5th to 20th. The earlier varieties occasionally get very fancy prices, but there is none of them that have the quantity or quality of the Elberta, and it can be got to the most distant market in good condition. There may be many other varieties, even of the oldest, that are as good, or better than those mentioned, but these we have found by experience to be good.

Good authority asserts that the Persian varieties will not do well in Eastern and South Florida. I would very much like to see them fairly tried on the clay hills of the central peninsula—say in Marion, Sumter and Polk counties.

#### PLUM CULTURE.

Of plum culture our experience in the western portion of the State is not sufficient to warrant any fixed opinions as to which is the best varieties. All that we are testing of the old, and the Japan or Chinese varieties, are good wood-makers. The best of the orientals so far as we have gone, is the Burbank or Abundance, or both, if they are distinct varieties as many claim.

#### NECESSITY FOR SPRAYING.

Of one thing I am satisfied about plum culture, it cannot be made a success without careful, continuous and regular spraying. Insect life appears to luxuriate on the plum. In addition to the regular lot there has appeared with us one, if not two new varieties of scale insect, and the plums appear to suffer most, though they are attacking the peaches as well.

I conclude that the future of plum culture—and possibly peach culture—depends on the efficiency and cost of spraying.

It pays well to raise good peaches. It is possible to get from \$500 to \$700 per acre from a crop from trees four years old. A very fair return may be had the second year after planting one-year-old trees.

#### FORCING EARLY GROWTH.

Nothing assures good trees more surely than forcing all the growth possible the first year. I consider this so important that I think trees are almost worthless that have not made a good strong growth the first year. No after work or fertilizing can make them the same they would have been if properly fed and worked the first year.

Of course, the first year or two, they need a fertilizer strong in nitrogen. I suppose the cheapest source of nitrogen for us is cottonseed meal.

#### COTTONSEED FOR FERTILIZER.

The very best three hundred peach trees I have ever seen at

three-year-old were fertilized the first and second years with crushed cottonseed entirely. The trees matured a very large crop of fruit the third year, and the fruit was simply perfection. I was astonished at the perfection of all of the fruit, as the trees were loaded down until the limbs lay on the ground. There was but little, if any, fertilizer put on the third year, so the strength, size and ability of the trees to mature a very large crop of fine fruit was from the feed of the first and second years.

## Discussion on Peaches and Plums.

---

G. L. TABER—In his paper Col. Harvey conveys the impression that the Burbank and Abundance plums are very much alike, if not identical. I presume he intended to say that the Botan and Abundance were similar, if not the same. Botan is the name of a class of plums, and is applied rather indiscriminately to a number of varieties.

Mr. HARVEY—I referred to the Burbank and Abundance as being alike. As I have these varieties I see no difference. I got my Burbanks from Mr. Taber, and my Abundance from another source.

Mr. TABER—I think the Colonel will find upon investigation that he received more Burbanks under the name Abundance, and I think upon investigation he will agree with me that the two varieties are quite distinct, differing markedly both in fruit and foliage. The Abundance was first sent out as the Yellow Fleshed Botan, by which name it is still commonly known. Of the Japan plums in my orchard I esteem Burbanks and Abundance as two of the best varieties.

JOHN W. HARDING—I would like to ask Mr. Harvey if any of the peaches referred to in his paper are free stones?

Mr. HARVEY—Yes, sir.

W. W. HAWKINS—I would like to ask in regard to plums. I have a large plum tree of the Kelsey variety, it blooms fully every year and never bears. What is the trouble?

Mr. HARVEY—I could not tell you what the trouble is. The species you mention, the Kelsey, is not a good variety.

J. W. HENDRY—Have you given any attention to apricots?

Mr. HARVEY—My boys have grown a few trees. I would like to say to those gentlemen who live in Middle Florida that it would be a paying investment to raise the Elberta peach. It would be the best money crop that you could put in the ground. It will ship anywhere. It is a fine peach to ship and a fine peach to can, and a fine peach altogether. It is the superior of any peach. With me it ripens from the 5th to the 20th of July.

O. P. ROOKS—I live in South Florida and I have tried the Elberta and it has universally proved a failure. We must try the oriental varieties entirely. There is a variety from Australia that is wonderfully prolific; it is called the blood peach, but as to the Persian type, I have no faith in them. They have never made a success. There have been thousands of dollars spent in planting varieties not adapted to our soil and our country. It is a mistake for this Society to appoint a committee from one part of this state to recommend a list of peaches to be planted in the whole state. We should follow the practice of the Georgia Horticultural Society and have a committee for each section.

Mr. TABER—Mr. Harvey has a fine peach orchard. Mr. Mellish at DeFuniak has fine peaches. There are lots of peaches in the western country, but the conditions are entirely different from other sections of the state. I live thirty miles west of here and I cannot raise the same peaches that Mr. Harvey does. The Elberta I have in my orchards, but I do not get any crops from them. The Alexander is a fairly good peach. Its only value is on account of its earliness, which, of course, is a great item in a commercial way, where it succeeds, but we cannot raise it here with any profit. I cannot explain why this is so. I am simply stating facts. Col. Harvey read about the Waldo being destroyed by frost with him; with me it is one of the most reliable of the early kinds. At Waldo, a few miles south of here, they get crops of this variety almost every year. There is a great deal to be taken into consideration in peach growing in Florida. No man can make a list of peaches suitable to the entire state of Florida unless he runs through quite a large number of varieties, and those varieties will be different for the different sections. I think Col. Harvey should have explained that the Elberta is a seedling of the Chinese cling type. There is a distinction between this and the Persian type. Belonging to this Chinese type the Elberta is suitable to a section of the country where the Persian will not do. I have said before that we cannot take Col. Harvey's list of varieties and adopt them for this section. The people should understand that they must get the varieties suited to their section.

Mr. HARVEY—In regard to this committee: The committee was appointed to write a report on peaches and plums. There was one gentleman from Orlando and one from Glenwood appointed with myself. As I have said, we did not meet; we had no correspondence and I have not seen the gentlemen yet. If we had got together, or had corresponded on the subject, I might have been able to submit a more satisfactory report. I know full well in this state that the varieties that will do for one section will not do for another, and it will take a lot of information and investigation, and a committee of this kind should have a correspondent in every section of the state and bring the mass of correspondence before the Association to give satisfaction. I know that the finest varieties in one section have succeeded indifferently or failed in other portions of the state. There ought to be stretched over the state a committee to correspond with every section and get the different kinds that are suitable to the different parts of the country. This might be satisfactory and useful to the Society.

W. H. H. HOLDRIDGE—In Alachua county, as in Baker county, we cannot raise the variety of peaches that are raised in West Florida. The Chinese type of peaches will do nothing with me. The Waldo and the Angel are all looking beautifully to-day, and at least three years out of four I get a crop of Waldos and Angels when the later varieties fail.

A. H. CAREY—My experience has been a pretty extensive one. I have for years lost money in peach culture and I would dislike to see people go into this business without a full knowledge of what they are doing and what fertilizers, etc., are needed.

Prof. P. H. ROLFS—I would like to ask Col. Harvey in regard to curculio. Does that bother you?

Mr. HARVEY—It does not affect any of our peaches if we have active trees. They affect old trees and eat up all the fruit, but there is no trouble on young and healthy trees. The young peaches seem to get so full of juice that the curculio does not like to bother them.

Prof. ROLFS—Three years ago that seemed to be the condition at Lake City, but last year the peach crop was almost a total failure. It is quite a disease in our portion of Florida. What remedy has proved most effective in destroying the curculio? I do not know whether our people have any knowledge on this subject.

Mr. HARVEY—I am using the London purple for this pest on my plum trees, and I am meeting with success. The Bur-

bank is comparatively free from the attack of curculio.

Mr. TABER—In relation to the curculio: We have it and we have it badly. I have lost an entire crop from this pest and it is a hard question to answer what is the best remedy for it. There are solutions of arsenic that will kill it if you apply them often enough, but it is a great deal of work, and as the most of us know, we have at times to neglect these sprayings when we know they might be profitable. Perhaps the best method is to spread a sheet under the tree and jerk off the curculio by hitting the tree a quick, sharp blow with a padded wooden mallet; this should be done very early in the morning (before sunrise, if possible), as at this time in the day the curculos are sluggish and relinquish their hold readily. The sheet can be drawn over a frame mounted on wheels, with a slot in the frame so that the tree can be jarred by pushing the frame against it. This jarring should be done every few days, commencing as soon as the blossoms fall and continuing until the fruit is half grown. The insects and stung fruit should be burned. Mr. Anderson, our treasurer, has charge of a very large plum orchard in New York state, and he tells me that they follow this method of jarring successfully. During the early part of the season the operation is repeated, if my memory serves me, as often as twice a week. Of course this is a matter to be studied up by a man who has a large plum orchard and he must take into consideration the question as to whether it will pay him to do it. It is a very serious trouble. The Kelsey is one of the Japanese plums that is very seriously affected by this pest. The Burbank is not so much subject to the curculio as the Kelsey.

C. A. BACON—It is said that the "early bird catches the worm." My experience with the Kelsey plum is that hens are the best remedy for the curculio. Let the hens do the work for you. Go out and shake the trees and let the hens pick up the worms. I have had great success in killing the borer. I put a few drops of kerosene in each hole and that seems to destroy them.

T. K. GODBEY—I think this subject of peaches and plums is a serious question. I might say a few words that would interest a great many. As you all understand, I have been growing peaches and plums for twelve years in Florida and I have made it a success. I have tried all the Persian varieties and they have been failures. I have tried the Kelsey plum, but it was so subject to the curculio that I have cut all my Kelsey trees down. I find that the Burbank does very well. In cultivating peaches I find that they require an abundance of fertilizer. I must say that my best trees are on plum roots. Occasionally one dies, but I do not think I lose any

more on plum roots than I do on peach. I have tried different ways of exterminating the borer. While it does not kill the tree, it injures it, and it takes more fertilizer to keep up the tree than it would if the tree were free from this insect. The remedy for root knot is to mulch the ground thoroughly and then leave it alone. I have applied potash to my peach trees. I could not tell where I applied it and I have never been able to tell where I put potash. I have used blood and bone or cotton seed meal and bone. I can buy this cheaper than I can any other kind of fertilizer. This year instead of cotton seed meal and bone I bought blood and bone as it furnishes the same material, and because I could buy a pound of nitrogen and a pound of phosphoric acid a little cheaper that way than I could in the form of cotton seed meal and bone. That is the way I buy fertilizers, and I always look at the price and the analysis when I am buying.

---

## About Pears.

---

The Committee on Apples and Pears submitting no report, the subject of Pears was discussed as follows:

G. W. MELLISH—Pears are doing very well around De Funniak. Our greatest enemy is the blight; that is about the only serious enemy we have. Pears are certainly a profitable fruit, and are very easy to raise. The bitter blight is a well known disease and I have no new remedy to offer. The only remedy I know of is to cut off all the blighted limbs just as soon as they appear, and the more thoroughly and quickly they are cut off the better. I have seen a good many orchards that have been neglected and they keep getting worse and worse. Orchards have been preserved in the midst of other orchards that were badly diseased, simply by cutting off the limbs.

S. S. HARVEY—I believe in the success of pear culture in the State of Florida. I believe further, that at the present time it is the best paying crop as a permanent investment that can be raised in this state. In my own neighborhood there has been no blight. We have never had any in my county that I know of. I have a neighbor that has an orchard nearly as large as mine, who came from California with the idea that

he could make more money in Florida than he could in California. He thinks that the opportunity we have to get fruit through to the markets in from two to four days gives us a great advantage over California, where it takes from five to twelve days to reach markets. I had a talk several times with him over the matter of blight. His impression is that we are free from the blight from the fact that we have a great deal of iron and sulphur in our soil. To the west of us sixty miles they have the blight but we do not have it. I am under the constant dread of its attacking us in the future. I am going to meet it, and with this idea I have investigated the blight where it has occurred in this state and in South Georgia. If a man will attend to his grove immediately after it is attacked and cut out that portion which is blighted and then use the Bordeaux Mixture, I believe his orchard will not be damaged. I went through De Funiak last June and I looked at the groves, and where I found the blight I found the men had let it take its course. I found good groves that had no blight, but they had been carefully attended to. Mr. Dubose has a grove of pear trees that was reported to have been attacked severely, although attended to promptly and sprayed with Bordeaux Mixture. I looked at his grove, and when we got within fifty yards of the orchard I said: "You have no blight". There was no appearance of blight whatever. He said: "Wait a little." We then proceeded to the orchard and found the ground covered all over with ends and points of limbs that he had cut off from those trees; but I found there was no blight on the trees and there was a good lot of fruit on them. From my experience and observation I have concluded that the blight can be controlled if handled properly. I have seen orchards that were nearly destroyed by it, both in this state and in South Georgia, but I have reached the conclusion that if the proper means are taken, using Bordeaux Mixture and cutting off the limbs, the blight will not materially affect the success of pear growing, and this is the course I shall adopt if my orchard is attacked.

As to the cultivation of pears, I think the best trees to plant are one year old. I believe that the varieties most suited to us are the Le Conte and Keiffer. I do not believe in high fertilization. I believe the peach cannot be cultivated too rapidly; with the pear this is not the best plan. A small amount is sufficient to keep it active in growth, and that is all you want. Let it grow so that in eight or nine years it makes a good tree. I will give you the positive size of one of my trees. A few days ago I took the size exactly. It is one of the best trees on my place. It was set out in 1875. It is now thirty-one and a half feet high; I measured it with two

fishing poles. This is the exact measurement. I dropped a plumb opposite the outer limb and measured across the space and it measured twenty-nine feet. The circumference of the trunk was thirty-four and a half inches. I estimate that this tree will carry twenty-five barrels of fruit. Last year I had two trees that were so heavily laden with fruit that they split to the ground and fell flat. I have heretofore estimated that an orchard should average ten barrels of fruit to the tree at ten years old. I have written some articles on the subject and I have always made that estimate. I believe now that it would be possible for a man to make a grove of Le Conte pears at ten years old average twentyfive barrels to the tree. That would be 1,750 barrels to the acre. I sold my crop last year in Chicago principally, while I shipped to Nashville, Cincinnati and St. Louis, but the larger portion went to Chicago, and my fruit netted me \$1.02 per barrel. These are the possibilities. It is possible for a man to raise 1,500 barrels on an acre of ten year old trees. I have a nice grove, and it certainly has proved successful. Whether it will continue so or not is a question of the future.

As to the quality of the Le Conte pear, two years ago I was in Chicago and I spent several days and nights on the fruit market there. I found at that time a great prejudice against the Le Conte pear. It had, prior to that time, gone mainly to the eastern cities; Philadelphia, Boston, Baltimore and New York. A very prominent commission man in Chicago said to me that he did not think much of our Le Conte pears. I did not see or hear from him again until last spring, when I decided to ship his house my fruit. I sent him a carload to begin with, and after selling that carload he wrote me that he had revised his opinion of the Le Conte; that this carload had sold better than any other pears on the market and that he believed the Le Conte the best early market pear. The Le Contes brought more than the Bartlett at almost every sale; this was quite encouraging. With my experience and from what I have seen, I have reached the conclusion that there is no equal to the Le Conte for marketing.

G. P. HEALY—I would like to hear from Col. Harvey as to his method of gathering the fruit.

Mr. HARVEY—I use cheap ladders in gathering my pears. I have one fifteen feet high, one twenty feet high, and one twenty-eight feet, with others even higher. I put two ladders together at the top, tying them with three-fourths inch rope. This makes a step ladder of two single ladders. I put two men on the ladders and they go up in the trees. They carry with them a sack with straps over the shoulder, such as is commonly used in gathering oranges. These sacks are made

of ordinary gunny cloth; an oat sack will make four such picking sacks. I discovered after a little experimenting that it was a bad plan to let the ladders get over into the trees. The pickers have a stick with a hook on the end hanging upon the ladders, and to get the fruit at the ends of the long single limbs, they draw the limbs gently to them with these hooks. A man on the ground takes the sacks which the pickers let down and lays them down in a basket, pouring them out by gently lifting the sack so as not to bruise the fruit. The wagon comes round through the orchard and carries the fruit to the packing house.

I put up my fruit in boxes of three sizes, large, small and medium. I papered a large portion last year. This was done by girls and women. I used a paper about the same that you would use to cover oranges with. I pack in the California boxes. I find that papering the fruit in a box of pears costs five cents. That includes labor and cost of paper. I put them in cars at my depot, piling them seven tiers deep. This is a little too much to put in an ordinary car. I would not advise putting in more than 600 boxes. I packed most of mine 800 to the car. I laid the boxes in the car endwise, but I leave spaces between each tier of about four inches. After I lay a tier I get strips and lay them across each tier. I so pile up to the top and ship in that way. I think it would be well for us to correspond with the railroad companies and request them to put better springs under their ventilator cars. By this means they would save us thousands of dollars worth of fruit in the season. The swinging of the cars is very hard on the fruit.

G. L. TABER—What is the weight of the material used in making your boxes?

Mr. HARVEY—It is very light material, weighing about two pounds to the box. It is still a question whether it pays to paper pears. It pays though, to ship in smaller packages. I would not ship my pears in barrels, although I have been requested by the commission men to do it. They do this for this reason: The retail dealers want it in barrels because they get more fruit at a given price. The same thing applies to papering. The fruit dealer does not want it papered. If it is papered he gets forty pounds of fruit. If it is not papered he gets forty-nine pounds. The fruit goes in better condition when papered; the chances are for better arrival. You must consider that you have to be out five cents for labor and paper with the chances of your fruit going to market in prime condition, against the disposition on the part of the retail dealers to get all the fruit they can for the smallest amount of money. Fruit packed in small packages, in a neat manner, beautifully

papered, will take the eye of the purchasers. They will say that they would not take so much pains unless the fruit were good. On the other hand, if the fruit is packed in barrels and shipped to the northern market, it is more likely to arrive in bad condition. I would not ship my pears in barrels if I knew they would bring me as much with less trouble. I have a sentiment in regard to it. I do not want to see my fruit go that way to the market. I am looking to the future, and I do not believe that is the way to build up and hold a fancy trade.

W. H. H. HOLDRIDGE—What does the railroad charge for the weight on the box?

Mr. HARVEY—I do not pay by the box, but by the hundred pounds. Here is an account of sales that I have had in my pocket for the purpose of showing the railroad people. This is a carload of 812 boxes of pears shipped to Chicago. The freight was \$250.55. As you will see, that is just about twenty-five cents per box. This I think too much. This carload sold for \$1,096.65. I had cars containing as much as this go to Chicago for \$165.

T. J. STUBBS—I would like to make a suggestion in connection with Mr. Harvey's statements. He advocated Bordeaux Mixture for pear blight, but I would advocate a trial of sulphate of iron instead of sulphate of copper. We have experimented with that kind of mixture, and apparently received a great deal of benefit. We expect to continue with it, and I would like to have other trials of the same thing. I would ask that a trial be made with the sulphate of iron instead of sulphate of copper.

Prof. P. H. ROLFS—From the careful experimenting that has been going on in France, and by the Department of Agriculture, the conclusion has been reached that the Bordeaux Mixture is the proper thing and not the sulphate of iron; that the copper compound is much more efficacious than the iron sulphate. It is much preferable. I think it has been used to a considerable extent and been tested by a great many persons, so we can no longer be divided as to that and as to the treatment of the pear blight. The limbs that are cut off should be taken from the orchard instead of being left there. There is a liability for insects to fly to those limbs on the ground and carry the bacteria to the tree again, and the wind would be liable to do the same thing. It would be well to be careful that those blighted limbs are destroyed quickly. In regard to pear blight in West Florida, specimens of infected trees have been sent me from West Florida. I think what Mr. Harvey has suggested in regard to the blight should be rigidly carried out, and the disease should be carefully watched to prevent its development in districts not now affected.

## Strawberries.

---

Prepared and submitted by H. E. Stoddard, of Nassau, Putnam county, Chairman Standing Committee on Strawberries.

The strawberry occupies a large space in the recollections of our childhood. Memory of the wide, waving meadow is dear to us for thoughts of the luscious, red berry which grew so abundantly there. The "old oaken bucket which rose from the well" refreshed, but the tall, green grass hid and sheltered a ruby treasure which satisfied our souls.

We have now come to maturity. Romance has gone with the passing of years and the strawberry is—what it was not in our earlier days—a commercial fact as well as an almost universal luxury. To consider its culture as an article of commerce and also as a gratification of our personal taste is the object of this report.

We will first specify the qualities which make when united the perfected strawberry so desirable :

It must be sweet.

It must be sour.

It must be hard.

It must be soft.

Lastly, it must possess harmoniously and combine all those qualities of size, color, taste and aroma characteristic of and belonging to the strawberry alone. The apparent contradictions seem to prove that there are really two distinct sides of the strawberry—the commercial berry and the berry of the connoisseur. I do not, however, think this entirely true, as most of these qualities may and do unite and blend in one harmonious whole. The meadow-grown berry of my childhood was both sweet and sour—in color a brilliant crimson—in aroma most fragrant; yet if carried a thousand miles to market it would get there covered with the moss of ages.

How to obtain these various and most desirable qualities to the exclusion of the undesirable is to a great extent still unknown, although many things have been shown by experience. Location, moisture and fertilization are prominent factors, but most prominent in fertilization.

We will first consider location. The natural habits of the strawberry seem to direct us to choose a place where it is readily available and yet not permanently wet (as in that case

the berry will be too soft)—a soil rich and retentive of moisture yet easily drained. Here let me say that a soil either naturally fertile or made so by judicious fertilization is generally retentive of moisture. To that extent fertilization will take the place of irrigation. By observing this principle I believe that the strawberry can be grown to perfection as well on high pine land as on rich hammock or flatwoods.

Second, moisture. How to obtain this in exceptionally dry seasons is a difficult problem. In some localities sprinkling by means of water thrown in the air from a hose does not suit the case. The fall of water even a fine spray has, in my own experience, had an injurious effect both in the quality and productiveness of the plant. This may, however, be from some other cause which my experience has not been extensive enough to detect. To my mind an effective scheme of sub-irrigation would be just the thing, especially upon sandy land, as that would unite the advantages of moisture and perfect drainage.

Moisture can also be conserved by mulching. The best article for this purpose is clean straw covering between the rows and carefully placed under the plant so as to prevent both leaves and fruit from touching the sand. Where clean straw, either oat or rye, cannot be obtained, wire grass raked when dry will answer quite as well. This is an excellent practice in any case, even where moisture is abundant, and the mulching should be put in place before the fruit ripens.

As to fertilization, which I deem the most important of all, much can be said. Even the wisest cannot say it all. We can apply chemicals which will cause the plant to grow and bear fruit, but the peculiar aroma which gives to every fruit its own individuality we cannot place in the soil. Most soils contain, to a greater or lesser extent, the acids of which that flavor is composed, but the tree or plant must compound them in its own laboratory. One thing, however, observation has taught—that the most healthy and normally vigorous plants and trees produce the most highly flavored fruit. To that end we can supply those elements which will but conduce to that result. You all know what they are—ammonia, phosphoric acid and potash. All these should be in the form of sulphate as we need the sulphuric acid to make our berry sweet. Almost any of the high grade fertilizers will be found efficient. My own preference is for a purely chemical formula.

Prepare the ground by thoroughly pulverizing it, at the same time mixing in as much fertilizer as your conscience will allow. You need not fear putting on too much if

thoroughly mixed with the soil a week or more before setting in the plants.

As to the proper time to set the plants opinion vary. September is none too early in this latitude for the market berry; October is not too late for home use. The market berry should ripen in February or March; for home use it will be richer if ripened in April and May.

These are a few of the principles observed by the best growers, and they will need modification as to locality and soil. Each must study and experiment for himself.

To you who plant for gain I would say that when the fruit first shows its crimson face, pick it carefully in the cool of the day, pack it daintily in honest measure, carry it to the station without a jolt and bid it good bye with joy for it shall return transformed from red to gold. And you, housewife or husband, looking not to pecuniary harvest—gather when fully ripe, sprinkle with sugar and cover with cream, and as you eat let memory carry you again to the scenes of your youth—sit once more in the porch of the farm house under the hill—look on the tall, brown grass in the meadow—think of the fruit gathered therefrom in the long-gone June days—feel once more the ecstasy of that childish appetite and then thank God that He created the strawberry and made it so good.

---

## Variety of Oranges and Their Derivation.

---

Paper read by E. S. Hubbard, of Federal Point, Putnam county,  
Chairman of Standing Committee on Nomenclature.

For several years I have given considerable time and thought to study of the derivation of the citrus, and comparison of varieties of the different species both by field study and analysis of qualities by a scale of points. At the DeLand meeting of the society I informally brought to its notice a chart that gives a bird's eye view of the derivation and development of the four primary species and their crosses or varieties. These primary species, like the thornapple of temperate climates, still grow wild in the East Indies, the native home of all the citrus, being all unedible, and are the fingered citron, the wild lime, the citrus trifoliata, and limonia or citrus acidissima.

The sour orange, familiar to all, is a representative of the lime family, though a hybrid many degrees improved over its original parent.

Most orange growers are acquainted with the fruit of the deciduous *citrus trifoliata*, which gives the musky flavor of fruit and hardy habit of the mandarin family, but as few have seen the fruit of the red limonia, which is the parent of the shaddocks, Tangerines and blood oranges, and the fingered citron, which has given the sweet edible character to all the citrus fruits, I took special pains while attending the Columbian Exposition, to find specimens in the East Indian exhibit, and was so fortunate as to secure the citron and limonia of the Siamese Royal Commissioner, and I take pleasure in showing these specimens to the society, for fortunately they are preserved in syrup, and retain perfectly their form and much of their color. The fingered citron, you will observe, is composed of loosely adhering lobes or segments without any central core, and these segments are almost entirely covered with peel and contain no edible juice. They are only used in the east like a bouquet of flowers, for the sweet odor they exhale.

This citron hybridizing with, and breeding up from the lime has developed two strains of fruit. The first are oranges, which retain the form of the lime but the sweetness of the citron. The highest bred examples we have are the navel and early oblong oranges, which you will observe in a general way have the same form as this citron. The second strain is the commercial lime and lemon family, which retains the modified acid of the wild lime, but the color and oblong form of the citron. This citron, progressively crossing with the *citrus trifoliata*, has developed the loose segmented mandarin orange. And, again, the citron and limonia crosses have produced the shaddocks and Malta blood oranges, which latter especially, closely copies the form of the limonia. It must not be understood that I suppose any of the hybrids we have to-day as being primary crosses, or even as resembling the fruit that would result from an equal blending of the qualities of any of these wild primary species, for the tendency of hybrids is to produce unedible monstrosities, and it is only the careful selection and cultivation by man through ages of time of the gradual improving varieties which have crossed and intercrossed with each other, that has given us the well nigh perfect fruit we possess to-day. Therefore, in listing oranges, I follow nature's grand divisions and make but four varieties: The citron or sweet China, the lime or Portugal, the shaddock or Malta blood, and the trifoliata or mandarin oranges.

As preliminary to the work of the Cataloguing Committee

I have, under these four varieties, listed some fifty-five sub-varieties of oranges of those in general cultivation having commercial merit, for many of the so-called varieties so nearly resemble each other that an expert can not possibly tell them apart. I append these lists, the names being set as nearly as possible in the ordinary sequence of edible maturity.

#### CITRON OR SWEET CHINA ORANGES.

1, Sweet Seville (Imperial); 2, Early Oblong; 3, Melitensis Navel; 4, Washington Navel; 5, Whittaker; 6, Nonpareil; 7, Parson Brown; 8, Centennial; 9, Old Vini; 10, Dulcissima; 11, Circassian; 12, Homosassa; 13, May's Best.

#### LIME OR PORTUGAL ORANGES.

1, Acapulco; 2, St. Michaels; 3, Double Imperial (Navel); 4, Dummitt; 5, May's St. Michaels; 6, Prolific; 7, Du Roi; 8, Pineapple; 9, Drake's Starr; 10, Paper Rind, St. Michaels; 11, Botelha; 12, Beach's No. 5; 13, Hart's Late.

#### SHADDOCK OR MALTA ORANGES.

1, Imperial Blood; 2, Boone's Early; 3, Sanford's Sweet Blood; 4, Amory's Blood; 5, Jaffa Blood; 6, Sauls' Blood; 7, Ruby (Du Roi Blood); 8, Malta Blood; 9, Jaffa; 10, Prata; 11, White; 12, Mediterranean Sweet; 13, Malta Egg; 14, Star Calyx; 15, St. Michael's Blood; 19, Majorca; 20, Malta Oval; 21, Valencia Late.

#### TRIFOLIATA OR MANDARIN ORANGES.

1, Satsuma; 2, Tangerona; 3, Mandarin; 4, Japan Tangerine; 5, Dancy's Tangerine; 6, Cowgill's Tangerine; 7, Cleopatra; 8, Travelers; 9, Sprack; 10, King.

After the reading of the above Prof. J. H. Webber said: I notice Mr. Hubbard gives possessive names of the different varieties. One of the rules of the American Pomological Society is that we should not use possessive names in naming fruits, and according to that rule Mr. Boone has changed the name of his variety to Boone. I merely make this as a suggestion.

Replying, Mr. Hubbard said: In listing these names I have given them as they are listed by the nurserymen. In cataloguing these fruits the society can take any action it chooses.

## Results in Crossing Navel Oranges.

---

By Professor H. J. Webber, of the Sub-Tropical Laboratory, of the U. S. Department of Agriculture, Eustis, Fla.

In our work on the orange and its diseases at the Sub-Tropical Laboratory our attention was early drawn to the unfruitfulness of the navel oranges in Florida. The various conflicting opinions of orange growers relating to the absence of fully developed pollen in the navel flowers, and contrasted with this the apparently current effect of navel pollen in accidental crosses, lead to experiments along this line. The experiments are by no means concluded, but have already yielded, at least very interesting suggestions.

It has been suggested by some that the unfruitfulness of navel orange trees in Florida was to be attributed to the absence of fully developed pollen in the navel flowers. In California, however, it is asserted that the navel trees bear an abundance of fully developed pollen, and thus their fruitfulness.

Again it is commonly claimed that the navel oranges produced occasionally on common sweet orange trees, and Mandarin trees are to be accounted to accidental crosses with pollen from navel orange trees.

A careful examination was made with a good compound microscope, of many anthers of navel flowers, from both California and Florida. This has shown that perfect, fully developed pollen is seldom if ever produced in navel flowers. In only two cases was any pollen found, and in these instances one could by no means be sure that it had attained full normal development. It is thus probable that the isolated cases of navel orange fruits on the common sweet orange tree will have to be explained in some other manner. I will not, however, speak of this point at present.

Microscopic studies of the development of the flower and fruit of the orange, have shown that navel oranges as well as the common sweet orange, grape fruit, sour orange, etc., form in the embryo sac more than one embryo. They are polyembryonic. Only one of these embryos is fecundated and developed. Frequently some of the others develop, but without fecundation. It was thus suggested to me that probably the development of these unfecundated embryos might

stimulate the fruit to development even if pollination did not take place. I thus in my experimenting opened a number of navel flowers last spring and summer (1893) before the pollen or pistil had matured, emasculated them (i. e. cut off the stamens—castrated) and immediately drew over the flowers thus treated firm paper or close cloth bags, and tied them around the branch below the flowers, so that all insects were excluded. A number of the flowers thus treated, matured fruits which were to all appearances perfectly normal, though developed we can almost positively say without the access of pollen.

Again this spring (1894) a number of flowers were similarly treated and several fruits have set and are to all appearances developing normally, though all pollen was excluded, and thus there was no fecundation.

The navel fruits developed last year from emasculated flowers on examination were all found to be perfectly seedless with the exception of a few small rudimentary seeds. Though my experiments have not yet been extensive enough to be conclusive it yet seems from the results obtained that the navel fruits possess the faculty of developing without the action of pollination and fecundation.

In my experiments, further, a number of navel flowers were crossed with pollen from various other varieties of Citrus fruits. The most notable feature developed in this series of experiments was that in all crossed fruits numerous seeds were produced, while in the fruits produced on the trees normally very few seeds were formed, and in almost all cases none. This commonly seedless character of the navel fruits is, as every one knows, the feature which most recommends this variety of orange.

In every case where navel fruits developed from crosses, I early marked, near by on the same tree young fruits of apparently the same age, and in every way comparable to the crossed fruits other than that they were developed without any treatment whatever, as they always naturally do in the groves. They were of course entirely open and may have been pollinated by insects or may have been developed without pollination. However, this may have been, the fact remains the same that in every fruit thus early marked as checks for comparison, not a single seed was found developed normally. In two or three instances rudimentary seeds about two millimetres long were found.

Many of the fruits from the same trees, developed normally, were examined and resulted in the finding of but few fully developed seeds. Occasionally, however, in fruits developed normally, one or two fully matured, plump seeds were found.

All orange growers are familiar with the fact of the occasional occurrence of good seeds in navel fruits.

My experiments were principally made on the so-called Washington and Parson's navels.

In a few of the crossed fruits, for instance, crossed with pollen of grape fruit, the seeds were much longer and larger than the seeds usually developed in the navel or common oranges.

On the contrary fruits on the same Parson's navel tree crossed with pollen from St. Michael's blood orange developed plump, full seeds of the character usually occurring in St. Michael's blood oranges. Photographs made of the seeds of different crossed Parson's navel fruits show plainly the differences and may even suggest the parent from which the pollen was taken.

The practical suggestion to be derived from the above results is that we should not take means to secure the cross pollination of our navel trees, hoping thereby to secure a larger crop of fruit. The effect of the cross pollination apparently being the production of seedy fruits; but not necessarily more fruits. These are merely suggestions and may have to be modified as more is learned of the subject.

---

## Experiments In Crossing. Citrus Fruits.

---

By Prof. W. T. Swingle, of the Sub-Tropical Laboratory of the United States Department of Agriculture, Eustis, Fla.

I should like to call attention to the fact that the work of crossing the best varieties of citrus fruits is in progress at the sub-tropical laboratory.

Our first crosses were made in March, 1893. To insure against any possibility of self-pollination, the flowers were opened forcibly before the pollen was ripe, and all the authors were carefully cut away. Then, to protect the flower against the visits of insects, it was inclosed in a paper or close woven cloth bag. This insured that no foreign pollen could be carried to the stigma by bees or other insects. When the stigma became moist and receptive, pollen from some other variety was applied, and the bags tied on again.

Of about a hundred crosses made, only nineteen developed

mature fruit this winter. The seeds from these fruits will be planted, and the hybrid plants will be forced into bearing as soon as possible. It is of advantage to have a number of seeds from each cross, since the offspring from a given cross are not by any means all similar. Often, on the contrary, they are often all different, combining in every possible way the qualities of the parent varieties.

By having enough crossed plants it would doubtless be possible to obtain any desired blending of the qualities of two varieties. By crossing the hybrid offspring with a third variety or with another cross bred sort, the possibilities of variations in the offspring are greatly increased. By planting large quantities of seed from such multiple crosses there is every probability that entirely new sorts will be obtained, some of great value. Aside from increased variability of cross-bred plants, there is much more chance of their producing valuable sports than with ordinary seedlings. In fact, sports are simply enormous variations, and are more often found among variable plants than among stable ones. It might be interesting to note that Luther Burbank, the great California hybridizer, depends wholly on these chance sports in originating new varieties by crossing.

It is our intention to cross in various ways all the best varieties of citrus fruits, and to attempt to obtain valuable new sorts in all these ways. Of course it will require some time to obtain results. At any rate, the work is started and will be pushed as rapidly as possible.

I have with me a few of the crossed fruits that you are welcome to examine. I have so far been unable to detect any difference between the cross-pollinated fruit and others growing on the same mother tree.

---

## Discussion On Citrus Fruits.

---

C. B. BACON—I would like to ask Professor Webber what he calls the St. Michael's blood orange. We have a St. Michael's orange on the east coast that is almost entirely seedless, but I understand that in the interior they have a St. Michael's that is as full of seed as any other orange.

Prof. WEBBER—I am not informed as to this. Very likely

Mr. Hubbard can give you a better answer.

E. S. HUBBARD—There have been several importations of St. Michael oranges and they are nearly all different. They have a peculiar character and are rather acid.

Mr. BACON—The orange that we call St. Michael's is commonly oblong, and it is late in season, say February or March. It is red, is a very rich fruit, and has very few or no seeds.

Mr. HUBBARD—You have what is commonly called the St. Michael's Egg orange.

Mr. BACON—My St. Michael's have as few seeds as many of the so-called seedless varieties. Just here I want to ask another question: Is there a seedless pomelo or grape fruit? I have seen frequent references lately to a seedless grape fruit, and I should like to know if there is a variety which has no seeds.

A. G. AVERY—We have some kinds with comparatively few seeds. I do not think there is a variety that is entirely seedless.

Prof. W. T. SWINGLE—There is one point I would like to mention: While at the World's Fair last summer I spent some time trying to discover the exhibits of citrus fruits, and must say it was a hard search. I finally found them. One of the finest exhibits was made by the government of Japan in the Educational Building. There I found a well written catalogue in English, on the varieties grown in Japan. Fifteen or twenty varieties of oranges were described. These oranges were represented by models, were well described and showed that there are much finer oranges in Japan than we have imported from there. I hope when our Importing Society is formed we shall get hold of these fine fruits from Japan.

---

## Diseases and Insects of Citrus.

---

Paper submitted by Wm. A. Marsh, of Orlando, Orange County, member of the Committee on Diseases and Insects of Citrus.

In approaching, and making the attempt to handle this subject, I feel rather timid, coming as I do before the veterans of citriculture. But I hope that my paper may be the

means of provoking a discussion that will result in good. In treating the subject before us, I shall call to my aid a special bulletin of the Louisiana State Experiment Station, which treats of insects injurious and beneficial that infest the citrus in that state, Florida and California. Every grower should have this work, which I presume may be obtained by addressing H. C. Newsom, Commissioner of Agriculture, Baton Reuge.

#### INSECTS.

One of the most troublesome of which is the Florida red scale (*Aspidiotus Ficus Ashmead*). It is round, of a chocolate color with a red spot in the center, a little less than a sixteenth of an inch in diameter. They breed with wonderful rapidity and spread over a grove in a very short space of time. It has been aptly described as "the most devilish of all scale insects," and it seems to come in a night. I believe it the most difficult to destroy. The adult red scale seems almost invulnerable, and the best time to fight them is when hatching, almost anything in the way of an insecticide will kill them at this time. They seem to be most active about the first of April and the latter part of August. The oyster shell scale (*Mytilaspis Pomorum Bouche*) seems to be the most common in Florida, and the least destructive. I have found that they could generally be disposed of by giving the tree some fertilizer. Another, the barnacle scale (*Ceroplastes Floridensis*), as his name implies, has the appearance of a barnacle, is white with a slight pinkish tinge, and when crushed exudes a liquid that has the appearance of blood. This scale is most often seen on young trees, and may be easily destroyed by a few applications of soapsuds. This insect is about three thirty seconds of an inch in diameter. *Aleyrodes Citrifolii* is a scale frequently seen on the leaves and stems of our trees, and appears as little white dots, sometimes almost completely covering the leaves and small twigs. This insect finally hatches into a small white fly or miller, its wings having a delicate purplish tinge. It is often very troublesome, and wherever smut fungus is found this scale generally accompanies it. Smut fungus has the appearance of soot, and a tree affected looks as though it had been liberally dusted with soot.

No doubt many of you have noticed numbers of your oranges, otherwise good, with a little hole eaten through the oil cells to the white portion of the peel. I found the little villain that does the work. There will be seen a little pointed cocoon, very ragged in appearance, attached to the orange, and has for its inhabitant a small black worm. What form of miller or fly it hatches into I do not know. The cocoons

may be seen sticking to the leaves, and even to the sides of buildings and fences in the fall.

Now is the time when we are most troubled with the orange aphid. This little insect varies in color from light green to black. They live on the juices of the young leaves, but do not occur in sufficient numbers to do any great damage.

One of the worst enemies of the orange is the "orange dog," an ugly, disgusting, hairless caterpillar, which, when touched, protrudes two red horns and emits a terrible odor. They feed on the young leaves, and it is wonderful the amount of foliage one of them will consume. They do great injury to young trees. The butterfly of this ugly larva is very beautiful, the wings above are crossed with yellow spots, while below they are yellow with black veins. On the tail-like projection of each hind wing is an eye-like spot of yellow, while near the inner angle of the same wing is another spot of red and blue. The female deposits her eggs on the most tender leaves of the tree; these hatch in a few days. The larval condition is passed in from ten to fifteen days, when the pupa state is entered, where it remains during the summer months. Six or seven broods may be hatched in one season, so it is well for the orange grower to look to his young trees.

#### THE RUST-MITE.

This minute insect, which is invisible to the naked eye, is a great source of annoyance to the orange grower, and causes a loss of thousands of dollars each year to the growers. The rust-mite is only 1,200th part of an inch long. The eggs are deposited singly or in clusters over the leaves and hatch in four or five days. In about ten days they shed their skins, and reach the adult condition, which differs from the young in being a little darker. It is during the hot, moist weather in summer when they become most abundant; cool or dry weather checks them. On examination of a single leaf infested with them Mr. Hubbard estimates the number of mites and eggs at 75,000. These little creatures are able to travel about twelve feet per hour, so they are able to cover a good deal of space in a short time. The result of the little fellows' work is not altogether bad, for our rusty fruit will carry a good deal better than the bright, and late in the season there is not much difference in price. The russet fruit holds its juices better than the bright. Almost any of the insecticides now in use will destroy the rust-mite, but the trees must have several applications for they work the year round, as their food is the oil in the rind of the orange and other citrus.

In some portions of the state the white fly is causing a

great deal of trouble this spring. These are some of our enemies, but we have some friends in the insect world. One, I would like to find the name for; it looks like a little tuft of down on legs, and is very active in destroying scale.

Then there is the little beetle, known as the lady-bird; the one most common is black with a red dot on each wing; another, not so common, is orange colored or red. The larva of these insects may be seen on dead twigs, or pine straw that has become lodged in the orange trees, and may be seen crawling about over the leaves. It looks like a little black or yellowish hairy worm, furnished with legs, and is often killed by persons who do not know them, thinking they are an injurious insect of some sort. These little friends destroy great numbers of scale insects. One bad thing about our spraying is that we destroy these friends along with our enemies, and it is a question if we do not lose in the end.

#### DISEASES.

*Mal di goma*, or foot-rot is a disease of the orange that has and is causing more destruction in seedling groves than any disease known to the orange. It seems to be almost as much a mystery as ever, and no one that I know of has yet ventured to say what the cause of it is. I have noticed that it seems to be most prevalent after a freeze. After the freeze of 1886 there was a regular epidemic of foot-rot. That would seem to indicate a defective circulation of sap, would it not? We all have our theories in regard to it, and mine is this: That at the time of a freeze the sap vessels or veins are contracted or dried down, and when the warm weather comes after the cold the roots commence forcing sap into the trees again, and the vessels not being able to receive the amount furnished them, burst through the bark in boils or sores. These sores often appear six feet from the ground, and even more, although the trees are most generally affected at the collar, and the main root just below the surface. The best means for stopping it seems to be by cutting away the diseased portions of the bark and exposing roots for a distance of two feet around the trunk. That would indicate that in setting a grove or replacing trees it would be a good idea to plant on slight ridges or mounds, as the soil tends to work to the trees all the time, and if we do not set them in this manner, in a few years we are apt to find our trees in slight hollows. I should think the best way to avoid the trouble would be to use sour or bitter-sweet stock. The sour stock rarely has foot-rot, while the bitter-sweet has the reputation of having never had a case of it. I have seen trees budded on sour stock standing with every sweet tree around affected, and yet the trees budded on sour were perfectly healthy. The disease may be readily distin-

guished by a novice; where the gum exudes the bark commences to die. Sometimes the discharge has a frothy appearance and a disagreeable odor.

Die-back is another disease that causes a good deal of loss to the orange grower; it is most noticeable in the fall when the wood is ripening. It appears in hard brown scabs or blisters on the smaller limbs and twigs; the scabs also are seen on the fruit. The disease spreads to the larger limbs and finally kills the tree unless measures are taken to stop it. It is caused by (well now I tremble for my reputation) too much plow and harrow for the most part, and can be caused by too much ammonia, but ammonia has to take the cussing for the whole family. If you do not "worry the soil" too much, it will take a tremendous amount of ammonia to give a tree the die-back. I tried it. I took a small tree for my experiment. The tree was about eight feet high and six feet through the top. I gave the tree two wheelbarrow loads of fresh stable manure, twenty-eight pounds of bright C. S. meal and eight pounds of blood and bone, all within one year, and I succeeded in giving the tree the die-back, but only slightly. It all passed away the next season, and has never shown since. The trees were only plowed once, and I hoed once during the year. I would suggest to those troubled with die-back, that they use the mowing machine more and the plow less, but do not stop fertilizing entirely, as some do. No cast-iron rule can be laid down, as there are hardly two groves on the same kind of soil. I think that the growers as a general thing cultivate too much and feed too little.

I have just received a letter from a friend in the southern part of the state, complaining that the white-fly is working sad havoc with their groves, some nearly ruined by it. I would suggest that from two to four pounds of sulphur be scattered around the tree or thrown into the branches, as you please; leave on the surface. The fumes will kill the fly, young scale and rust-mite; at least, that has been my experience.

Hoping that I have not proved too tedious, and my effort not altogether in vain, I am, yours for the advancement of our society and all it implies.

---

## Sulphur Solution--Blight--Lemon Scab.

---

Report by Prof. W. T. Swingle, of Sub-Tropical Laboratory, Division of Vegetable Pathology, U. S. Department of Agriculture, Eustis, Fla., Chairman Standing Committee on Diseases and Insects of Citrus.

Prof. SWINGLE—I have been too much engaged in field work to present to you to-day a written report. Of course, the subject is a broad one. I will proceed for the first part to consider insects. I am not especially occupied with this subject at Eustis, nor is Prof. Webber. I have, however, something of interest to report regarding the insect enemies of citrus plants, that is, in regard to the solution which is used to kill the rust mite and the red spider. I found yesterday afternoon, after quite a number of tests, a new method of preparing a sulphur spray. I wish to show you how to make this sulphur compound. I take it for granted that the members understand what sulphur spray is used for. It is a cure for rust mite and is very valuable in fighting spotted mite (red spider). The following is the recipe for making this solution:

Thirty pounds of pulverized sulphur (good quality), twelve quarts of water, then mix; add twenty to thirty-two pounds of caustic soda (twenty pounds of ninety-eight per cent. or thirty-three pounds of sixty per cent.), then mix.

After mixing the sulphur and water the caustic soda is placed in the same vessel and the whole mixed well. A reaction takes place, the mixture becoming hot, turning brown and finally becoming liquid. This liquid should be diluted to twenty gallons of water and kept in tight barrels ready to dilute for use. Caustic soda can be obtained from Eimer & Amend, 207 to 211 Third avenue, or Geo. B. Forrester, 169 Front street, New York City. I simply give these names because I happen to know that they sell the caustic soda. They do not sell less than 700 pounds. Seventy per cent. potash costs about \$3.95 per hundred; ninety-eight per cent. about \$5.30 to \$5.50. It is cheaper to buy the ninety-eight per cent. soda at these prices. It is in powder form, like flour. A great many dealers have a low grade on hand. It would not be advisable to use this.

### PROCEEDS TO MIX THE SOLUTION.

You will notice that a small quantity of water is used

When you first make the solution it will seem incredible that such a small quantity of water would suffice. It makes a very stiff paste, and it must be a stiff paste or it will not work. It is also essential that the flour of sulphur be stirred well with the water. The caustic soda can now be stirred in with this sulphur paste. This can be done in wooden vessels. It is not necessary to have metallic vessels; in fact it is better not to use metals since they are attacked by the sulphides formed. This solution can be made up in the field in a barrel. The right quantity of caustic soda can be weighed out and put in a glass jar, with a tight fitting cork, and you can make the solution as you wish to use it. It will keep if protected from the air. This is a concentrated sulphur solution. I will state that the cost of sulphur is about  $1\frac{1}{2}$  cents f. o. b. New York City. I cannot state exactly though, but this is about the figure. It can probably be obtained of some good dealer in Jacksonville at 2 cents f. o. b.

L. MONTGOMERY—I beg to state that it can be bought for \$22 a ton f. o. b. New York City.

Prof. SWINGLE—After the reaction has taken place, dilute the liquid to twenty gallons. The cost per gallon of this made up solution will be about 5 to 7 cents. The same thing can, of course, be made with potash if it is so desired. Caustic soda will do the same as potash. It might pay to use potash instead of caustic soda, but at present the cheapest sulphur spray that can be made is with the caustic soda. The same proportion of caustic potash is to be used as of caustic soda. I will experiment further with this and will publish the results in full in all Florida papers. The sulphur solution will be of great benefit in fighting the enemies of the orange. I would not advise the use of more than one gallon to fifty gallons of water for anything. It is probable that from one to two quarts to fifty gallons will be required to kill the rust mite. For the red spider I would use from two to four quarts to fifty gallons.

E. BEAN—I have a copy of Miller & McMaster's patent covering this property of dissolving sulphur by the use of caustic soda. The Professor can read that portion relating to the sulphur solution.

(Prof. Swingle then read paper submitted by Mr. Bean which was on the subject of Miller & McMaster's patent).

Prof. SWINGLE—From the part of the patent that I have read I cannot see that there is any infringement on Miller & McMaster's patent. I prepared my solution a few days ago and I am sure I have never before seen a copy of the patent I have just read. I doubt if my solution can be patented. It

is really not a sulphur solution, but a solution of sodium sulphide, but I hope to work on it further and give the members of the Society the advantage of whatever discoveries I may make.

There are a few other points I wish to report on relating to the work in progress at the Sub-Tropical Laboratory, on the diseases of citrus fruits.

#### BLIGHT.

**First**—In regard to the orange blight: I have been before the Society for three years telling a continued story about blight and I am sorry to say that the discussion will have to be continued longer. Prof. Webber and myself have been experimenting at the Sub-Tropical Laboratory at Eustis in a number of different ways, but we are surprised at the extreme slowness in which these experiments show results. Having made for two years careful examination of the blight of the orange, we have been unable as yet to find any cause which could produce this disease, but every experiment we make strengthens the view that the disease is contagious. It has been found almost uniformly that extirpation of the first few cases in the grove is the best way to prevent the spread of the malady. We have in progress experiments to prove whether this disease is contagious. The blight very often spreads from adjacent trees. It is still unsettled whether the disease can be conveyed from the top of one tree to another. We have taken buds from blighted trees and inserted these buds into healthy trees—into the top and into the roots and we will watch with interest the progress of this experiment. We will report on all of these experiments later. I would urge all those who have only a few affected trees to take them out and burn them. There is little doubt in my mind but that trees contract blight from one another. To growers who have large numbers of trees affected, such a measure might seem to be severe and I would suggest to such that some of the more vigorous trees might be grafted to quick bearing varieties. This, however, I would only urge in cases of long standing. Those trees that are burned should be burned on the spot and not dragged through the grove.

**Mr. PECK**—Over what region of the state does blight extend?

**Prof. SWINGLE**—I have seen it all over the state.

#### FOOT ROT.

Upon the foot rot we have done so far only a limited amount of work, but we have at last found a region where we

can try remedies and we hope to report the result of these experiments later.

#### LEMON SCAB.

I have since the 1st of February given my almost undivided attention to this disease, and wish to thank Mr. Sampson and Mr. Buffum for their efforts to aid me. I have found the disease to be caused by a very minute fungus. The disease proves to be exceedingly difficult to combat since the young fruits can be infected for at least two months. I have no doubt we will finally be able to overcome the disease. We have found the copper sprays to be the best remedies. I have found the Bordeaux Mixture very good. I expect to get out a bulletin from Washington on this Bordeaux Mixture and a copy will be forwarded to each member, and also the report on treating the lemon scab when it is published. Prof. Webber will report later on his experiments with die-back.

J. H. WRIGHT—It has been my experience in using Bordeaux Mixture that it is a preventive more than a cure.

---

## The "White Fly" And "Sooty Mould."

---

Verbal report by Prof. H. J. Webber, of the Sub-Tropical Laboratory, the United States Department of Agriculture, Eustis, Fla., made in compliance with the special request of the Society, preferred at its last meeting.

In fighting insect and fungus pests it is first necessary that we know something of their life history, growth, transformations, habits, etc., that we may more intelligently combat them.

The Sooty Mould is a saprophytic fungus, deriving its nourishment, not directly from the orange, as is sometimes supposed, but from sugary excretions exuded by certain insects, which it always follows.

In Florida Sooty Mould only becomes serious when it follows the White Fly, *aleurodes citri*, and it is with its treatment in this connection that we are concerned.

The logical way, and apparently the only effective way to treat this disease is to destroy the insect pest which the fungus follows. As soon as the insects are removed and the sup-

ply of honeydew, upon which the Sooty Mould lives, is stopped, the mould will disappear without other special treatment.

The White Fly passes the winter in the mature larval or pupa stage, and begins to hatch out into the mature stage (Imago) about the middle of March. This year, 1894, I first noticed them beginning to appear on the 13th of March. The eggs from the fall brood of flies hatch about the middle or last of October. So from the middle of November till March, is one of the long periods when the disease may best be treated.

Each fly lays from twenty to twenty-five eggs. These require about three weeks for their development before they hatch out into the larval stage. Thus the eggs from the March and April brood do not begin to hatch until the middle of April, and continue hatching till the middle of May. The larvæ from these eggs continue their development till about the middle of June or first of July, when the mature flies hatch out again, and begin laying eggs for the next brood, which hatches out from the middle of September to the first of October.

This September brood of flies, the third brood, is the last of the season; the eggs they lay hatch out into the larval stage about the middle or last of October, and this stage continues through the winter as described above.

Considerable question yet remains as to the effect of the various insecticides on the eggs, and while this doubt exists it is best to arrange the times of spraying so that we do not spray till the eggs are all, or almost all hatched out into the larval stage. As there are three periods in the year when the insects are in this stage, there are thus three periods when one may profitably spray for the pest. One must judge when to spray by the condition of the insect, being sure they are in the larval or pupa stages. In general, this condition is reached about three weeks or a month after the mature flies are noticed to be most abundant.

While many remedies have been tried and experimented with for this pest, none have been found up to the beginning of this year which had proved satisfactory. In our experiments with this pest this season, we have tried every spray which promised success, applied in various ways. We have tried to make our tests thorough, and believe we have succeeded in demonstrating the effectiveness of certain standard sprays, beyond question.

In California, fumigation with hydrocyanic acid gas is being used with great success against various scale insects. So successful is it, indeed, that some claim it to mark a new era in the treatment of such diseases. We, for this reason, made

quite thorough fumigation tests on the White Fly with very excellent results. The treatment was made about the middle of February of this year (1894) and was so successful that it was only by careful search (in treatments with certain strengths of material) that one could find a living insect.

Fumigation is accomplished by passing over the tree a tent of some closely woven material (eight-ounce ducking, for instance) which has been oiled and painted black, if the treatment is to be made by daylight. After the tent has been placed over the tree the edges are held down by a few shovelfuls of earth thrown on here and there. The operator now places under the tent in an earthen or glass jar, the material for generating the gas. For this purpose crude potassium cyanide, commercial sulphuric acid and water are used in varying quantities, according to the size of the tree. A tree sixteen feet high, and having a spread of twelve feet will require about eight ounces of potassium cyanide, eight fluid ounces of sulphuric acid and sixteen fluid ounces of water. The water and sulphuric acid are placed together in the earthen vessel and placed by the operator under the tent. The potassium cyanide is then dropped in, and the operator quickly withdraws from the tent, closes the opening, and allows the treatment to continue for thirty to forty minutes. The tent is then removed and the operation is complete. To work this method economically, from four to six tents must be used in order to keep the laborers busy during the delay, while the gas is acting.

Careful descriptions of the methods for fumigation are given in the various bulletins and reports of the Division of Entomology of the United States Department of Agriculture. The latest of these are: The Gas Treatment for Red Scale, Bulletin 23, Division of Entomology; Hydrocyanic Acid Gas as an Insecticide, Insect life, volume VI., (1893) page 176; and A New Fumigator for Scale Insects, Insect Life, volume V., page 328. The above articles were prepared by Dr. W. D. Coquillette, the originator of the gas method of treating insects.

Prof. A. H. Morgan, of the Louisiana Agricultural Experiment Station, Baton Rouge, has given a plain account of the methods of fumigation in a special bulletin: On the Orange and other Citrus Fruits.

The details of application would require too much time for their explanation, to consider further here. We can say positively, however, that this method of treatment is very effective. All of you have sprayed trees and know how hard it is to reach all portions of the tree, and in treating such a pest as this, every insect must be covered by the spray to be killed. Many thus escape, no matter how thorough we spray. After

putting twenty-five gallons of spray on a tree twenty-five feet high, I have yet found hundreds of leaves unwet on the under surface of the leaves where, in this case, they must be wet if the spray is to be effective, as the larva and pupa of the fly limit themselves almost exclusively to the under surface. The gas treatment, however, overcomes this difficulty, as the gas will penetrate to all portions where the air can reach, to every leaf under overhanging portions of bark, etc. It is the nature of this method which makes it so effective in a single treatment.

In fumigation, some care must be exercised, as the potassium cyanide and hydrocyanic gas fumes are poisonous. In actual work, however, there is almost no danger if judgment is exercised.

Of the various sprays experimented with, kerosene emulsion is the one which has been most widely recommended as an effective spray for this pest. Our experiments show kerosene emulsion to be fairly effective, killing a large number of the insects, but that is by no means so effective as the so-called rosin washes. The rosin washes are also much cheaper than the kerosene emulsion, and are easier prepared if one follows the method we now use in its preparation.

Rosin wash, according to the formula usually given, is prepared by using 70 per cent. caustic soda, and requires several hours (from two to three), boiling. This long boiling has been a feature against the wash, preventing use. I have found that by using the 98 per cent. caustic soda one may shorten the time of boiling with apparently as good results. Our formula and method of preparation is as follows:

|                                |                      |
|--------------------------------|----------------------|
| Rosin.....                     | 20 lbs.              |
| Caustic soda, 98 per cent..... | 4 $\frac{2}{7}$ lbs. |
| Fish oil.....                  | 3 pints,             |
| Water to make.....             | 150 gals.            |

Directions for preparing wash—Place rosin, caustic soda and fish oil in a large kettle and pour over them about fifteen gallons of water. Boil this mixture till the rosin is thoroughly dissolved. Pour into spray tank and dilute to 150 gallons (this requires adding about 135 gallons more water). Apply on plants in rather a coarse spray. The material after boiling may be diluted while warm as well as after it cools, but if allowed to cool, a fine precipitate of soap forms, and this must be stirred up on diluting it, so as to be thoroughly dissolved.

This spray may be preserved in a concentrated form for some time before using if desired.

When the material is removed from the fire after boiling, pour in sufficient water to make up for that which has evapo-

rated in the boiling, making exactly fifteen gallons. This is now preserved in this strength. As it cools a copious fine precipitate forms which gradually settles to the bottom of the receptacle which contains the preparation. When it is desired to use the spray, stir the preparation thoroughly to uniformly mix this precipitate, then measure out and dilute in the proportions of one part of the preparation to nine parts of water.

The secret of the failures that have resulted from using the rosin wash spray, have been from using poor materials. I would recommend that the 98 per cent. caustic soda be used in preparing the wash, as by so doing we may, as shown above, very much shorten the time necessary to prepare the wash, and thus cheapen it.

This rosin wash would more properly be called a rosin soap, as a double soap is formed in its preparation, a rosin soap and a fish oil soap. If we reduce the amount of water which we add in boiling the material, we have a nearly solid soap formed of about the consistency of the common soft soap manufactured by housewives. The material could be used in this form, but requires rather too much stirring to dissolve it, to render this method of preparation practical.

Rosin can be purchased in Jacksonville at from \$1 to \$1.50 per barrel of 275 pounds.

Crude fish oil can be purchased in New York or Philadelphia for from thirty to forty cents per gallon.

Ninety-eight per cent. caustic soda can be purchased in New York or Philadelphia for from  $5\frac{1}{4}$  to  $5\frac{1}{2}$  cents per pound.

The cost of making the wash would thus be as follows:

|  |      |
|--|------|
| 20 pounds rosin, at $\frac{1}{2}$ c per pound.....                       | 10c. |
| 3 pints fish oil at 5c (40c per gallon).....                             | 15   |
| 4 $\frac{2}{7}$ lbs. 98 per cent. caustic soda, at $5\frac{1}{4}$ c..... | 22   |
| <hr/>  |      |
| Cos' for 50 gallons.....   | 47c. |

The wash as prepared to put on the trees would thus cost approximately one-third cents per gallon.

The wash is easily handled, runs through the pump easy, spreads on the leaves well and is very effective.

An equivalent amount of caustic potash could probably be used in place of the caustic soda, but I have not yet had an opportunity to try this. If it should prove successful, however, as I mistrust it will, even considering the value of the fertilizer thus added to the field, the spray will not be materially lessened in cost.

## Discussion on Citrus Insects and Insecticides.

---

C. F. A. BIELBY—I would like to ask Prof. Weber if he has given the whole formula for the rosin wash?

Prof. WEBBER—Yes, I have given the whole formula which in our tests with different strengths we found could be reduced to 150 gallons and yet be very effective for the White fly, and will probably also prove effective for the six-spotted mite, scale insects and plant lice.

LYMAN PHELPS—Have you tried it on the Black scale?

Prof. WEBBER—It has been tried on the Black scale in California, I believe, but I have had no opportunity to make such tests.

Mr. PHELPS—I would say that Prof. Mead and I tried it last year on the Black scale and it did not work.

Prof. WEBBER—I was not aware that the Black scale occurred in Florida.

Mr. PHELPS—We have had it at Orlando and Oviedo.

Prof. WEBBER—I have not observed it in Florida yet.

Mr. BIELBY—I would like to ask the Professor if I have the formula correct, as follows: Twenty pounds of rosin, 4 2-7 pounds of caustic soda (98 per cent.), and 3 pints of fish oil. Put in a kettle with 15 gallons of water and boil until the rosin is thoroughly dissolved; then dilute with cold water. Is this correct?

Prof. WEBBER—Yes, that is correct. I would like to add further that the Red scale (*Aspidiotus Ficus*), which is probably the worst scale pest of the orange in Florida, other than the White fly, may probably be controlled by the rosin washes. The soap or wash when made will keep for an indefinite period. The samples exhibited here to day were prepared last Saturday, and are as good now as then, and will be as good a year hence.

A. L. DUNCAN—I wish to say that I have used this rosin and fish oil wash for about three years extensively. The formula came to me from California, and I have tried it at all seasons of the year. I have been preparing it just the way the Professor gives, excepting that I use  $7\frac{1}{2}$  pounds of rosin and

2½ pounds of soda. I also use the Starr Ball Potash, or the Sterling Ball Potash, from which I get equally as good results. It takes a little longer to boil it. I always put it in the tank hot. I use a 150-gallon tank. It is the most effective remedy we ever had for scale. I tried it on the lady-bug, immersing the bug in the solution, and it would afterward fly away. I tried it on the grasshopper, also, but they were not injured by it. The effect on the Round scale is that it turns black and drops off in a few days. It is better than kerosene emulsion. It covers the tree over, but the rain finally washes it off. It takes me quite a little time, however, to prepare this wash.

Prof. WEBBER—What did you dilute it with; warm water?

Mr. DUNCAN—Yes, sir.

Prof. WEBBER—After you have the material mixed up, what is the proportion of dilution that you use?

Mr. DUNCAN—The same as yours. I use a little less of the rosin.

Prof. WEBBER—Do you merely dilute one part to one part, as in the formula generally given?

Mr. DUNCAN—I put in about five gallons of the preparation to make fifty gallons of spray.

Prof. WEBBER—One of the points I make in regard to my method of preparing the wash is that in using 98 per cent. caustic soda one can prepare it with so short a boiling and then dilute it more times than in the usual formula, that is, one part to nine.

Mr. DUNCAN—There is one thing you all ought to know. It would not be well to apply the spray when the fruit is young, as it will neutralize the acid. I once had an experience of this kind. I followed the advice of a California writer. The acid of the fruit was completely neutralized. We did not know until the fruit was matured what was the matter, or what caused it. We found out that it was this spray. Do not put the spray on at this time of the year, and not until the fruit is of considerable size. About June is the proper time, I think.

Prof. WEBBER—In spraying for the White fly you would necessarily make the first applications before the fruit comes on. You should make your first applications probably in January or February. The second period of spraying comes from about the middle of May to the middle of June. This spraying could be delayed until the fruit had become quite large. In treating other scale insects you can change the time. I was not, however, aware that any injury of this sort was produced by the rosin washes.

C. A. BACON—Would it not be more effective to spray immediately after the flies disappear when the scale is more tender? Would they not be more tender after the laying of the egg?

Prof. WEBBER—I would wait until the eggs are hatched. The eggs are protected by a coating which it is hard to penetrate.

Mr. BIELBY—I would like to ask the Professor if he has any reason to suppose that the injury to the quality of the fruit which Mr. Duncan speaks of was due to this wash?

Prof. WEBBER—I have not before heard of such injury being produced by washes of this kind.

Mr. BIELBY—Have you ever heard that they hurt the quality of the orange?

Prof. WEBBER—I have not, but such things do not always get into print. One of the main reasons for which the rosin wash is recommended is that it will kill scales much better when they are attached to the fruits than other insecticides, especially kerosene emulsion. This would indicate that they are at least not known to produce injury to the fruits.

H. W. MARSH—I would like to say that Mr. J. E. Wilbur, of South Lake Weir, and Mr. Tilson, of Orange Bend, have told me that they are using Thrip juice, and that they have shipped their fruit a month earlier than usual, which they attribute to the effects of Thrip juice. This was reported by two different men, who had no connection with each other at all.

Some one asked Prof. Webber what effect Thrip juice had on the scale.

Prof. WEBBER—I have not tried it on any scale insect except the White fly. Here it did not give satisfactory results, and cannot be recommended.

A. D. MOORE—I met a gentleman on the train who told me that he had eradicated the White fly with Thrip juice.

Mr. WARREN—I tried Thrip juice three years ago and found that it killed the White fly. Last year they came in great numbers a second time. I tried Thrip juice again and the first application finished them all.

L. MONTGOMERY—When the oranges matured were they full of acid?

Mr. WARREN—Yes, every one that tasted them said they were exceedingly nice and sweet.

Mr. DUNCAN—I have a word to say about bi-sulphate of soda. I know two men that used this stuff on their trees and

their oranges were worthless. One of them, Mr. Hoyt, gave me a sample of his oranges, and there was no acid in them at all. I take the position that bi-sulphate of soda will neutralize the acid in the fruit.

**EDWARD WINTER**—The spreading of diseases and insects of the citrus is a matter of such serious importance that it seems to me we should make some effort to prevent it. I have recently seen nursery stock badly infested, if we can take steps to prevent such pests being disseminated I think we should do it.

**Mr. BACON**—It cannot be done. It is impracticable. These troubles are spread in many ways we cannot reach or control. Take the smut for instance; it thrives anywhere, it will even grow on potatoes. Five years ago I discovered it on the palmetto trees about my place. It spread quite rapidly, but for a year I did not see any on my bearing orange trees. Then I began to see a little on my large trees, and the third year I began to get worried. The trees bloomed well, but dropped their fruit, dead limbs began to appear, a great many leaves dropped off; in the fall you could see through Mandarin trees that formerly you could not thrust your arm into. The fourth year I got a spraying outfit and went to work. I used a lime and sulphur solution, the recipe can be obtained from the Farmer and Fruit Grower.

**Mr. DUNCAN**—A good deal of the smut found upon orange and other trees is not produced by, or rather does not follow the White fly. We had smut on orange trees before we ever heard of the White fly. This smut is easily destroyed by the rosin wash.

**G. P. HEALY**—Some time since I supposed I had the White fly. I was discouraged. The grove seemed in a bad fix, and the fruit was getting very black. About that time Prof. Webber arrived. We examined the trees and in my case the sooty mould was found to be following the wax scale instead of the White fly. It was a bad case, but I used Thrip juice and cleaned almost all the smut off the trees. The owner of one grove we visited while Prof. Webber was at my place said he had had the smut (but not following the White fly) and had gotten rid of it by the use of tobacco juice. At another place we found the sooty mould following the White fly, and the owner assured us that he had not succeeded in finding anything that was effective in destroying it.

**Prof. WEBBER**—In regard to tobacco juice: The trees Maj. Healy and I saw did seem to be effected by the tobacco juice, but to what extent it had been effective as a remedy for the sooty mould could not be determined. I tried tobacco-

juice in four different strengths on the White fly, in my experiments at Gainesville. The solution is apparently impracticable, as it kills only about 15 per cent. of the larvæ or pupa of the fly. Continuing in reply to the question of a member: I consider the rosin wash or rosin soap, discussed in my remarks on the subject, as probably the best remedy for the White fly. I learn from inquiry that this pest apparently first became serious at Panasoffkee. It appeared there some seventeen or eighteen years ago.

**H. B. STEPHENS**—I have a grove at Panasoffkee, started about five years ago. Shortly afterward the White fly appeared. I did not know what it was at first, but found later that it was the White fly, and that it was the worst enemy we had. They spread very easily; the trains undoubtedly carry them from one section to another. Last year we commenced operations against the White fly. We burned tobacco, sulphur and Dalmation powder under the trees, confining the fumes by a tent over the trees, but did not find this effective, and confined ourselves to tobacco juice and sulphur solution. In the fall there was no smut on the fruit, and I felt that I had accomplished something. This spring Prof. Webber came through and examined the trees and he said he did not find any living insects on them.

**Mr. DUNCAN**—How to destroy the White fly is what we all want to know. This rosin wash acts like a varnish and will be more lasting than anything else. Sulphur solution will dry and wash off the tree, but the rosin wash will last two or three weeks unless the rains are very heavy. I think the rosin wash is the best for the White fly.

**Mr. BACON**—I think, myself, that the rosin wash is the most effective of the two; but the sulphur and lime solution does not wash off immediately. You can smell the sulphur for months after an application.

**GEO. R. FAIRBANKS**—I wish to say something about insect pests. I came to Florida fifty years ago. The orange trees had been previously cut to the ground by the cold. They had grown up rapidly from the roots and about the time they came into bearing again I was at St. Augustine. At this time the scale insect appeared. It was said to have been brought in upon trees imported from Italy. In the course of five years it had attacked every tree at St. Augustine and along the St. Johns river. The trees looked as if a fire had gone through them, and everybody said there was no use trying to do anything with them. They left them alone. In a few years, from some cause or other, the insects disappeared and orange culture revived. It was said that the insect had

been introduced from Nice. Application was made through the State Department for information regarding it. It was found that they did not know anything about it in Italy. Finally an old man was found who had some knowledge of it; and an old book was also found (which book I have) which treated of this pest as it had appeared in the neighborhood of Nice, and went on to say that all the oranges were blighted and going to destruction and proposed certain remedies. The fact I wish to call attention to is that this pest once so much feared at Nice is no longer known as a serious enemy there. This pest, so prevalent here fifty years ago, which we have had since 1842 and which we know now in a modified degree, has not proved a serious obstacle to the development of our orange industry. In view of these facts, I do not think we need fear that our orange industry is going to perish, or even suffer serious injury from the ravages of these enemies of more recent introduction which have been referred to.

---

## Truck Farming.

---

Paper prepared by J. A. More, of Pensacola, Escambia county, Chairman Committee on Vegetables, and read by the Secretary.

The raising of vegetables for family use only, as practiced by our forefathers in their little gardens laid out in squares to be dug and cultivated exclusively by hand, is a thing of the past, and in its stead we have the broad acres of the truck farmer, tilled with the most approved labor saving implements. Wheel hoes for hand use, scarifiers, cultivators and harrows for horse; the seeds and commercial fertilizers are applied with similar apparatus. Thus equipped, the truck farmer takes rank among the most prosperous of our citizens.

The raising of vegetables for the northern and western markets is becoming one of the leading industries of our state, and is largely increasing each year, and a few years will find our state almost one entire vegetable garden, sending out solid trains where now we send single cars.

Our friends in the southern part of our state are particularly favored by having a climate during the winter months to be found nowhere else in the United States, where the tenderest vegetables, like the tomato, egg plant, beans, cucum-

bers, etc., grow to the greatest perfection and bring big prices.

I saw only a few days ago account sales for thirty crates beans shipped from Bartow to a Chicago commission merchant that sold for \$128, or an average of \$4.27 per crate; it is true the railroads or express company charged \$30 for freights. The commission man charged \$12 for selling them, \$10 perhaps covered all the other expenses. You will see the shipper netted, with all this enormous expense, \$2.50 per crate. Of course this is an extra price, indeed it is, but it shows that there are people that will eat beans it matter not what they cost, and if that shipper had had 1,000 crates to ship the day he shipped those, there still would have been nearly 2,000,000 people in Chicago that had no beans for dinner that day. I mention this to show you that there is no possible chance of ever overstocking the hungry snow-bound cities of the north with fresh vegetables during the winter months.

Almost every kind of vegetable is grown in our matchless climate, but for shipment to northern markets, cabbage, potatoes, Bermuda onions, tomatoes, beans, peas, egg plants, squashes, and cucumbers form the bulk of the shipments in some localities. Cauliflower and celery are very successfully grown, and will in a few years be leading articles; and nearly always bring good prices. The best time to plant the different kinds of vegetables must be determined by the locality and surrounding circumstances. It would be folly for the grower of West Florida to plant his tomatoes, egg plants and beans in December or January; if it be done during a cessation of extreme cold, the return of winter weather or an unreasonable frost may in a single night destroy the labor of many weeks (as it has done in the past few weeks). In West Florida we generally plant our cabbage, peas, beets, turnips, onions, lettuce and all hardy vegetables from August 15 to December 1. Potatoes in January and February. Right here I want to dispel the idea of not saving our own seed potatoes; thousands of dollars are sent out of our state every year for seed when we allow the best seed we can possibly get to rot in our fields. If we let our potatoes get thoroughly ripe, dig them in a dry time, remove them immediately and out in a cool, dry place (under the house is a good place) they will keep perfectly sound. About the 15th of August bed them like you would sweet potatoes (I mean the small one about the size of a walnut). Keep the bed moist and partly shaded for ten or twelve days when they will be nicely sprouted, have your land ready and plant the whole potato. If the seasons are good by the 1st of November you will have a good crop of potatoes. These

potatoes raised in the fall are the very best seed that can be planted the following spring. They are earlier, more productive and are superior in every respect.

The potato and cabbage, like most all vegetable crops, require the very best culture, and the soil can hardly be made too rich. The late Peter Henderson said to grow any kind of vegetable crops successfully, "you must use the right kind of fertilizer, and to put on the land just twice as much as you thought it needed, then put on as much more and you would have just about half enough," if this applied to New York soil, I will leave the growers of Florida to be their own judges.

---

### Discussion on Vegetables.

---

S. H. GAITSKILL--I think Mr. Moore is correct in saying that beans pay handsomely at times; for instance, one of my neighbors had a nice crop last year ready to pick when the frost took them all off. I live in a section of the country where we grow lots of vegetables, and I think I can say that they are profitable one year with another, as much so as any crops grown in Florida except pineapples; we cannot quite equal Captain Richards' 300 per cent. a year. (See Pineapples, page 35.) Last year we made some money out of cabbage. This year we sell them at 40 cents a box, and that does not pay us much. We ship seven or eight carloads a day. We have some little trouble with cabbage this year that is new to us. I think it is a little like the red spider on the pineapples. This trouble seems to be between the leaves and the ground; the stalk seems to rot. So far we do not know what it is. No great damage has resulted, though. I cannot say anything particularly about vegetables unless some man wants to know something of the country and what we do there. I can give more satisfaction by answering questions. It is an everyday business with us, and we do not see many points to talk on. We grow all kinds of vegetables, and ship plenty of them. We make lots of tomatoes. We get good money for these. We have one drawback. One of my neighbors had twenty acres in cabbage last year. He shipped 4,000 crates, and the railroads got out of those 4,000

crates just \$160 an acre. He would be willing to sell his land for less money than that, and we have this drawback to contend with. While I think vegetable growing, with the proper men to grow them, is profitable, I do not think the indiscriminate growing of vegetables is advisable.

C. A. BACON—How does Mr. Gaitskill fertilize, and what does he use? I suppose he uses any fertilizer he can get. What is the state of the soil? One of my neighbors remarked to me the other day: "I am sorry we cannot use stable manure." I used it but it killed my plants. The manure did not kill the plants, but the worms in it did. I do not understand how to apply it to orange trees, and I cannot use it on vegetables, on strawberries or onions. I would like to know how to use it. I want to keep stock, and I want to save every cent I can. I think the manure should pay for one half of the feed, but I cannot use it.

Mr. GAITSKILL—That is rather a new idea that you cannot use stable manure. I have a small kitchen garden something larger than this room. I have three horses; I feed them well, and I put all the manure in that garden. I never had the trouble you speak of. I used good quantities of potash along with the manure, and that may have had something to do with it. As to the fertilizers we use. We use all sorts of fertilizers; some use cotton-seed meal only for tomatoes, and various kinds of fertilizers for various crops; some use one brand and some use others. As to what is best, I cannot say.

In regard to Mr. Moore's report on potatoes; I have potatoes all the year round. I cover them about a foot deep with straw, and when they mature I go and dig them. I do not find any trouble with them. I do not even take the trouble to dig them, but let them stay in the ground until I am ready for them. I use stable manure on potatoes and onions successfully; at the same time, as I say, I use lots of potash, too, and use some phosphoric acid in the shape of dissolved bone. I have more trouble with moles than with anything else; they follow after an application of cotton-seed meal, but I do not use much cotton-seed meal.

Question—How do you get rid of the worms?

Mr. GAITSKILL—I don't try to get rid of them. I try to get enough feed in the ground for the worms and the plants, too. I find the best thing to do is to feed the worms.

Mr. BACON—How do you apply the stable manure; for instance, to cabbage, Irish potatoes and general garden truck?

Mr. GAITSKILL—Before the ground is broken up for the crop I distribute it and plow it under. The ground is not

ready for planting, though, until the manure has rotted. When the manure has rotted then it is ready for the vegetables. I think potash can be used at any time; as to the quantity, as Mr. Moore said, apply "about twice as much as you think you should put on, then you have half enough." In planting vegetables, I think you can put from 300 to 400 pounds of potash to the acre to advantage; I use potash in the form of sulphate. I do not use muriate on vegetables, especially tomatoes. I have but little truck growing comparatively, and most of the potash I get is for orange trees.

O. P. ROOKS—What kind of straw do you use?

MR. GAITSKILL—The straw I use on my potatoes is refuse hay. I make plenty of crab grass hay and use the refuse from the stacks in my horse lot. I do not know that it is any better than pine straw. I do not live in a pine straw country. It is immaterial whether you cover the straw with dirt or not. I threw my stable manure over the ground two inches thick, had my seed ready, put my potatoes in the furrows and just turned the ground over. I plow very shallow. I do not plant them more than one and one-half inches in the ground. I am trying to get along without much work.

MR. ROOKS—Mr. Gaitskill says the only trouble he has is with moles. I understand the moles live on the worms in the manure.

MR. BACON—There are some points in regard to the use of stable manure that I would like to know. In the first place, can we throw stable manure on top of the ground and not lose one-half or two-thirds of its benefit? Will it not pass off in the air? If we bury it under the ground, and it is full of worms, will not the ground be full of moles? Now the question is, how can we use stable manure? If we throw it on top of the ground the moles do not trouble us, but it is dissipated; if we bury it, the moles and worms trouble us. We do not get much benefit from stable manure on top of the ground unless we are certain of putting it on when we know we are going to have a heavy rain. The grubs destroy my vegetables, and for the last year I have quit using the stable manure for that purpose; the radishes and cabbage were all cut up by the grubs.

LYMAN PHELPS—There is good enough sulphate of magnesia in sulphate of potash to fix the ammonia in stable manure so that there is no waste; neither can the grubs find good living there. Moles will not find good living there, and nothing will stay where it cannot find good living.

H. G. HASTINGS—Stable manure has in every case been used with sulphate of potash round my place. In regard to

raising Irish potatoes: There are people who make mistakes every year about planting, selecting and raising potatoes. They will buy northern-grown potatoes and plant those in the fall, and the result is that three-fourths of the potatoes will rot in the ground. The one way to make a successful crop is to save the seed from the spring before. Another thing I wish to remark in regard to Mr. Moore's paper, that is, his statement of prices on beans. When this society sends out reports they should be made on a reasonable basis. That report would make a newcomer think that all beans sold for that price. We know that this is not so. Beans under proper circumstances will pay a reasonable profit on the investment, but I say again that we must send out reports on a reasonable basis.

LYMAN PHELPS—There is one point that should be clearly understood. We are talking as though the whole of Florida is one distinct climate, while we have four distinct climates, and if we can get things so arranged that we can get reports from one section and then another, it can be understood better. It is not clear to everyone now. We should have different reports from different climates. The time for planting Irish potatoes varies from two to six months in different parts of the state.

Mr. HASTINGS—Have the tomatoes been affected by blight this season as much as last?

Prof. P. H. ROLFS—Black rot affected them more than anything else. It has been a great deal worse than at present. The vegetable grub is in Florida this year to the extent that it was last, but this is a little earlier than the bad reports were brought out last year. There was very little blight in Polk county. The blight is not so bad this year as it was last; we can say that as a whole.

Mr. HEALY—The use of stable manure on vegetables has been one of the most expensive as a fertilizer that I could use. A ton of stable manure at its best is probably worth on the land \$2; that is its outside value. Its distribution is very expensive, and its action in cultivation is very bad, and it is difficult to cultivate small vegetables where you use stable manure. Commercial fertilizers are more easily applied, and I will stick to them.

G. H. WRIGHT—There is no value to stable manure according to Mr. Healy. I have been using stable manure and I am growing two good crops a year. I take my ground and cover it over two or three inches with stable manure, make a furrow and put my potatoes in it. The stable manure goes on a soil of fine sand on which I raise my potatoes, and I then

cover the potatoes with pine straw. There are six inches of it over the top of the ground. I do not plant until the 1st of February, and about the 1st of April I put on about 200 pounds of sulphate potash to the acre. When my potatoes are ready to dig I rake off the straw, and in gathering the potatoes I leave the small ones under the ground; the large potatoes are taken from the ground. I then spread my straw as evenly as I can, and my second crop is planted. That makes my fall crop of potatoes, and if any fertilizer gives better results than my stable manure I would like to know how it is done. I consider stable manure as one of the most valuable fertilizers we have. There are a great many things in stable manure which are very valuable to the soil of Florida. I get from my pine straw a great deal of potash, I think, and I find it valuable. As for the worms, I am not troubled by them at all. I get rid of those by putting on finely powdered tobacco stems.

Mr. MONTGOMERY—In regard to straw for Irish potatoes: We find almost any kind of straw—pine straw, or any kind of litter tramped up a little so as to break it up—put on Irish potatoes will do. We have used broom sedge more than anything else, but we have used pine straw. No fertilizer is better than manure for oranges.

---

### The Best Lawn Grass For Florida.

---

H. A. STODDARD—I want to ask a question before the next report is taken up. I am very desirous of raising a lawn. Some recommend one kind of grass and some recommend another. I want to know if there is anyone present who is using Bermuda grass?

G. P. HEALY—if there is irrigation I do not see how anyone can make a more beautiful lawn than with Bermuda grass. I have used Bermuda grass for this purpose ever since I had it. With irrigation it makes a beautiful lawn. There is not a time in the year when it is not green. The only trouble I ever had with Bermuda grass was when it had gone through an unusually hot summer, but with a good coating of fertilizer

and plenty of water, any man can have a beautiful lawn with Bermuda grass.

Replying to questions Mr. Healy continued:

I have found cotton seed meal to be the best fertilizer for this grass that I have ever used. Any complete fertilizer is as good. The use of cotton seed meal and wood ashes applied together would not do. I generally make one application of cotton seed meal in the spring of the year and later in the season I give a coating of wood ashes. I have never used potash. I have got good results from cotton seed meal and wood ashes. I put a heavy two-horse harrow all over my lawn late in the fall. It makes it lumpy for a few days, but it does certainly add to the growth of it for the balance of the year. If you have irrigation you will not need this.

EDWARD WINTER—Have you ever tried nitrate of soda?

MR. HEALY—No. I think you get in the cotton seed meal all the potash and ammonia you need.

MR. STODDARD—Do you have any trouble in keeping Bermuda grass from spreading? I do not want it spreading all over the place.

MR. HEALY—I will answer the gentleman that I could not get the grass to spread enough. I think, though, I would be very careful if I had a kitchen garden near my lawn. You should not use the same plow on your kitchen garden that you use on your lawn. If you use the Bermuda grass for mulching, of course it might spread, I know that it can be carried in stable manure. I am satisfied that Bermuda grass can be carried in stable manure, for I have had it in my sweet potato patch. I have found this grass there when I could not account for it in any other way except from the use of stable manure. It is possible that the seed might be dropped there in some way. From my experience it can be carried in stable manure. In a sweet potato patch it is not likely to spread. Bermuda grass wants fertilizer and a good deal of it. I give my grass plenty of fertilizer.

G. L. TABER—I think Mr. Healy has some very good ground to grow Bermuda grass upon. It will grow upon almost any soil. It is very hard to keep out of ground where there is any chance for it to grow. I am a little under the impression that in a few years a good many of us like the Major will want more of it. I think it is a good thing where you want it.

A. H. CAREY—if you allow your horse to graze on Bermuda grass and you take that horse anywhere else on your place, you will find the grass will grow.

S. H. GAITSKILL—I have seen in this Society muck men,

fertilizer men and stable manure men, but this is the first time that I have heard men say that Bermuda grass would not grow. In our county there is no fertilizer needed to make the grass grow. It is a fertilizer of itself and fertilizes itself. We do not need any outside help. We cannot get rid of the grass when we want to. It is a singular thing to me that a man will say that this grass needs fertilizer or anything else. It grows without any aid in the world. It grows all over an ash pile. Now, can anyone tell me how to kill it when I want to kill it.

H. W. MARSH—I have seen Bermuda grass come out of a five-foot post hole. If you want it for a lawn you have to fertilize. It is very difficult to kill it out, but it would not make a pretty lawn without fertilizer.

Mr. HEALY—It is not a question of its growing. It is a question of its getting green and beautiful. It will grow on my lawn without cultivation, but it will not be a thing of beauty. I have to use fertilizers to produce the good effects.

F. D. WAITE—I have a little spot in my yard, probably fifteen feet square. For two years I have been trying to get my lawn to cover that patch, but I have been unsuccessful.

Prof. P. H. ROLFS—I would like to ask about the Texas blue grass. I have seen very fine lawns of that. Is this peculiar to our section (Columbia county). I have seen two plats that were high and dry that produced a good crop of Blue grass. Has any one had experience with this grass?

G. W. MELLISH—I have planted Texas Blue grass. During this last spring I fertilized it and it came up and is spreading more than I had any idea that it would. I have strong hopes that it is going to seed and I am certain of getting a lawn now. I do not know that it would grow from seeds, but I know that it will grow from roots. I have no trouble to get rid of it when I want.

Prof. ROLFS—The advantage of Texas grass over Bermuda grass is that it is easily got rid of.

W. M. BENNETT—I was about to suggest a mode for confining Bermuda grass to reasonable limits, but after hearing the testimony I feel a little diffident about giving my experience. I have Bermuda grass on my place. I took some planks and set them on edge and confined the grass in that way. I buried the planks about one and one-half inches in the ground. The most important matter for our consideration is how deep the grass grows. We can watch it above ground, but we cannot below ground. How far will it grow under ground? To

exterminate Bermuda grass it is necessary to get under it. Hoeing will not do it and what will?

Mr. HEALY—I would like to say in regard to the depth that it runs: I have dug Bermuda grass four feet deep and could not see that I was getting near the bottom of it. I have dug holes six feet deep and still found the Bermuda grass roots, and they were still going down. You cannot tell how deep they grow. The deeper they do go the better fertilizer they are.

Prof. ROLFS—Do you contemplate going to China? If so you can find the roots.

Mr. CAREY—in reference to Bermuda grass: If those who have lawns of this grass will use a highly ammoniated fertilizer and have water and keep it nicely mown, they will have no difficulty.

Mr. MELLISH—In attempting to exterminate this grass has anyone ever tried a heavy application of salt?

Mr. GAITSKILL—I have tried heavy application of salt and of potash without avail. I was a little afraid to put the salt on for fear I should kill everything else I had.

J. T. STUBBS—I have applied salt and boiling water and hot ashes and destroyed the Bermuda grass on the surface, but it came up again. I do not think there could be salt enough to destroy the Bermuda grass without destroying the land. Heavy applications of salt will destroy the land.

Mr. STODDARD—No one has spoken of Louisiana grass.

Prof. ROLFS—Louisiana grass requires moist soil, where it grows thick it becomes a carpet grass, but on rich land it will make stems.

THOMAS E. RICHARDS—I have Bermuda grass on my place and I have no difficulty in keeping it in check, because I have some St. Augustine grass growing alongside of it; it will not run through this St. Augustine grass.

Mr. STODDARD—I have some St. Augustine grass, but have trouble in keeping it growing. I do not know but it would answer the purpose Mr. Richards mentions.

---

## Injurious Insects.

Paper read by Prof. P. H. Rolfs, of the Agricultural Experiment Station, Lake City, Columbia county, Chairman of Standing Committee on Entomology.

After receiving the notice from your honorable ex-secretary, Mr. Hart, much thought was put on just what the nature of the report on entomology should be. After the field had been carefully considered it became clear that I would not be serving the Florida State Horticultural Society nor the state to the best of my ability, by bringing here correctly named specimens and fine stereopticon views to illustrate important insects under discussion, nor by presenting some new device or insecticide for slaying our insect enemies by the thousands. Ladies and gentlemen—This way of treating the subject has been in vogue since the organization of the society; the speeches have been good; often considerable time had been spent in their preparation. These discussions have been confined to insect enemies that were in the state. Let me present to you three insects that we have not, and one that has barely put his foot on Florida soil.

### THE OLIVE POLLINIA.

The olive industry is just beginning to attract some attention in this state. Much has been written and said of it in California. New and promising varieties have been introduced from Europe. Recently it has been discovered that with this importation from Italy there has been brought in also the olive pollinia, *pollinia costae targ.* This scale insect so closely resembles the bark that it will not be detected ordinarily. It is particularly dangerous in that the usual washes or insecticides do not destroy it. In passing I may mention that there are several other insects in Europe on the olive that have not yet found their way to America. The pollinia is a serious pest even in Europe, where labor is cheap and its enemies present to checkmate it.

### THE GYPSY MOTH.

(*Ocneria Dispar.*)

This most destructive pest was brought to this country by Mr. L. Trouvelot, now of Paris. Mr. Trouvelot was at the

time experimenting at Medford, Mass., with native worms in raising silk. He brought a cluster of gypsy moth eggs from France, and accidentally lost them. The larvae did not attract especial attention, so no effort was made to stamp them out in the beginning. Whenever noticed they were thought to be simply canker worms, tent caterpillars or some other native and less destructive moth. It has now spread through 29 cities and towns of Eastern Massachusetts. The territory is bounded by a line beginning a few miles south of Boston, running west three counties, then two counties north, and then in a northeasterly direction to Manchester. It is more or less thickly disseminated throughout this area. In places where it is abundant the fields are simply devastated. There is scarcely a plant that is sacred to its abnormal appetite. In 1890 the legislature appropriated \$50,000 toward its destruction. In 1891 \$50,000 more was appropriated, and in 1892 the sum had to be raised to \$75,000. First the work was handed over to excellent men who had no entomological training; later it was put in the hands of scientific entomologists, but the gypsy moth, she is still there.

Much good has been done; the pest has been kept from spreading by strict laws and patrolmen constantly watching the border. Ladies and gentlemen—How very easy would it be for some good friend of yours living in the infested district to send you a few grape cuttings that might have been secreted under their loose bark or in the sphagnum about them, a half-dozen of these eggs that are about the size of mustard seed? Or perchance be sent in with a few choice roses. You see any one might be perfectly innocent and yet cause the loss of thousands of dollars worth of property.

#### THE FLUTED SCALE.

Those who were present at the Pensacola meeting, remember the stereopticon slide illustrating the life history of the fluted scale (*Icerya puerchasi*). This will be found on pages 149, 150 and 151, Proceedings Sixth Annual Meeting of the Florida State Horticultural Society. Let us look at the rapidity with which this insect spreads. In 1885 Mr. Cook, at Sacramento, noticed that this insect covered a space of about three by four inches on an acacia tree. In less than two years it had spread over an area of 12,800 square feet, or more than a quarter of an acre; at the same rate in two more years it would have spread over much more than an entire township. Curious as it may seem, this insect was imported on an acacia, a plant belonging to an entirely different family than the orange. This pest is such an omnivorous feeder that when once established it simply permeates all the vegetation, and

the orange suffers most severely. The date of importation is 1871. It was 1882 before any strong efforts were made to eradicate it, and it was 1890 before it was finally gotten under control. The local horticultural societies worked hard; the county horticultural societies aided all they could; the State Horticultural Society went to the legislature; the legislature appropriated money and passed laws; congress made special appropriations, and for a while it looked like the world against the fluted scale. It is now under control, but it took more money than any legislative body ever gave to the orange industry of Florida. It is not our good judgment that has kept it out of Florida, but rather the strict quarantine of California. If it were to be imported to several places in Florida, I predict that it would defy all fertilizers, insecticides, and all gases; it would take up its abode in our hammocks and bay-heads on the bay trees and other evergreens, making them a constant source of infection. They would be a scourge, the like of which has never visited our balmy state.

#### SAN JOSE SCALE.

(*Aspidiotus perniciosus com.*)

This very pernicious scale was imported from Chili, and, therefore, an imported enemy. It has been called the San Jose scale, because it was destructive in the San Jose country, and the first work was done against it in that valley. In spite of all efforts, time consumed and money spent with a view of destroying it, there is still a respectable amount of the infection left there; sufficient within a few years to infect Maryland, Virginia, New Mexico and Florida. We are threatened. In California it has defied the county horticultural societies, the state horticultural societies, the legislature and the United States Division of Entomology to dislodge it. Like the fabled hydra of old, it springs up out of its own ashes. While you are cutting it to pieces in California the chips fall in New Mexico, in Maryland, in Virginia and Florida. Ladies and gentlemen—If this pest is allowed to be disseminated throughout Northern Florida, who will in 1904 represent the Florida State Horticultural Society from that section?

Mr. President, you will pardon me if I digress from the entomological on so important a question.

#### SERAH.

At the Pensacola meeting Prof. Swingle called the attention of the society to the fact that there existed in Java a bacterial disease of sugar cane. That there has been a standing offer for four years of \$5,000 to anyone devising a practical plan for overcoming this disease. The Professor also

called attention to the fact that the importation of a single inch of such a diseased cane could, under the proper circumstances, hopelessly ruin the sugar industry of Florida.

#### PEACH ROSETTE.

In the same speech attention was called to the existence of peach rosette in Georgia, just across our border line. I will not go into the description of this disease; suffice it to say that it is only a question of four or five months' time from the attack until the trees are only good for fire wood. But the worst of the whole matter is that a portion, ever so small when carried from a diseased to a healthy tree, can produce the disease in the healthy one. Thus the unsuspecting fruit grower may, on the blade of his pruning hook or grafting knife, carry the disease to any or all the trees in his orchard, from one diseased tree. This disease is not in Florida as far as I am able to learn.

#### THE CALINORNIA VINE DISEASE.

In Orange county, California, seven years ago there was 10,000 acres of vines. The land sold for \$300 to \$500 per acre; last year the same land would not bring more than \$75 to \$200 per acre. The loss as a result of this vine disease is estimated at not less than \$3,000,000. this the lowest estimate. This single disease has rendered worthless for vine culture, 20,000 acres or more. The cause, introduction and cure are all unknown. There is no doubt that our soil, climate and temperature will permit this disease to be propagated.

#### POURRIDIE.

##### (*Dematophora necatrix.*)

Let me speak of another vine disease that we may expect almost any time; this is known in France as pourridie. It is caused by a fungus, *dematophora necatrix*. This has lately been introduced into Australia in a bundle of grape cuttings. It is not present in Florida, but the climatic conditions are perfect for its propagation.

#### MANGO BLIGHT.

Mr. President—I have one more case to offer. There has been lately, i. e., within the last three or four years, introduced a blight of the mango blossoms. As far as my observations goes, it exists only in a limited area, and could be easily subjugated or entirely destroyed.

We are in imminent danger of all the diseases discussed in this paper. But these are not all that threaten our prosperity.

Two of them are already within our borders; the others may be to-morrow. Your neighbor may to-day import the San Jose scale, and you may know that it is the dreaded insect, but what are you going to do about it? You may kill such as cross to your premises, but you have no right to enter his field to destroy the source of infection. This brings to mind the case in Sacramento. In 1885 the city trustees appropriated \$200 to exterminate the fluted scale within the city limits; this was done excepting within certain premises where trespassing was forbidden. This open source of contagion had to be endured until the legislature made it lawful to enter these premises.

Let us take a brief review of these troubles. The olive pollinia is a native of semi-tropical Europe; the gypsy moth, of France; the fluted scale, of Australia; the San Jose scale, of Chili; the serah, bacterial disease of sugar cane, of Java; pourridie, vine disease of France, is now in Australia; the California vine disease, of California; the peach and plum rosette, present in the southern part of Georgia.

The olive pollinia was brought to California on the olive, by whom, not known. The fluted scale brought to California by private enterprise. The gypsy moth brought to Massachusetts by a foreigner. The San Jose scale in same way as fluted scale. Pourridie taken to Australia in a bunch of grape cuttings. Mango blight, not known. Serah, of sugar cane; peach rosette and California vine disease, still in the place of original discovery, and let's keep them there.

In looking over the diseases you will see that the great majority have been introduced by carelessness of private enterprise. It is a rare thing that a nurseryman or dealer allows anything of this kind to be disseminated.

Can anything be done to remedy this? Yes! What? First, prevent the introduction; second, stamp out any sporadic case. Massachusetts is preventing the gypsy moth from spreading and is thinning out its numbers in the infested regions, although it infests thousands of acres. Iowa has cleared her fields of Canada thistle without costing the state anything. California has, on account of her carelessness, a herculean task to perform; if she perseveres success will crown her banner. Florida is peculiarly free from disease. I know of no other one state so free from disease. If you will look at the map you will see that there is only one source from which natural infection can take place; that is from the north. The severest diseases of temperate United States do not flourish in semi-tropical Florida, so there is only a limited number to be contracted from that source. The Australian, Chinese, Japanese and Western South American plants have been first

brought to California, and have there gone through a season of cleansing, and then sent to Florida.

Now it is very clear from what other states have done, that the artificial source of infection is under control if we only think so.

Mr. President, as the best manner in which this could be reached, let it be suggested that a committee be appointed to look into the laws of the different states and countries if possible, and bring out their defects and excellencies, and report them with recommendations to this society at the next annual meeting.

---

## Discussion on Injurious Insects.

---

G. P. HEALY—I would like to ask Prof. Rolfs if there is danger of importation of Gypsy moths on apples and potatoes?

Prof. ROLFS—There is not a great deal of danger of importation on the fruit. They secrete their eggs on bark and trees. There is more danger of importing it with packed fruit. They will lay their eggs in straw. In potatoes there is very little danger at all, but we should be very careful of this moth because it is a destructive enemy.

Mr. HEALY—I understand, then, there would be danger in buying seed from Gypsy moth districts.

Prof. ROLFS—Yes, sir; in the packing there would be danger.

G. W. MELLISH, Vice-President (presiding)—I would like to hear from some of the other members.

Prof. ROLFS—I would like to say that our chairman is familiar with a very serious pest in his district, that is, the San Jose scale, and I am sure the Horticultural Society would like to hear what is being done to exterminate the scale.

Mr. MELLISH—I am not very familiar with the scale mentioned. I was not aware that such a scale was in existence until Prof. Rolfs came into my neighborhood. We knew that some trees were dying, and it was a year or two before

we knew what was the matter. I do not know much about it; all I do know is that it is a very destructive pest. I do not know that I can give any information on the subject. I received notice a short time since that the Department of Agriculture would issue a bulletin on that subject, and it would be well for anyone interested in fruits of any kind to secure that bulletin so that they might know the pest when they saw it. The sooner it is killed the better.

Prof. ROLFS—When the scale is abundant it causes the tree to look whiter than usual, though you would not notice it ten feet away. A badly infested tree may be recognized at a considerable distance; appearances are like that of a starved tree, often only a branch or half of the tree is attacked, then the appearance is quite striking. If the tree is only slightly infested it is quite difficult to discover. When the scale is abundant the bark is completely covered with it. Some one has said that they pile on six deep, and this seems almost literally true in bad cases. There are a number of scale insects that resemble this one, but this is the most destructive one on our deciduous fruits. It is so small that it requires close looking to make it out. When full grown, it is circular in outline with a dark prominence in the center. These points may be seen by the use of a hand lens, or ordinary magnifying glass. It breeds continuously throughout the warm weather. The females being wingless prevents it from spreading except in the larval state. Birds, horses or mules while plowing, or the owner himself while working his orchard may carry the young insects from tree to tree. The young, or active, insects are scarcely discernible with the unaided eye. Their color is a honey yellow. We should do all we could to stamp out this scale, for it is very destructive and will soon spread to other portions of our state.

Mr. HEALY—I would like to have a description of the scale from Prof. Rolfs.

Prof. ROLFS—When the scale is abundant it causes the tree to look whiter. You would not notice it ten feet away, but when you get close and hold it up by the end you will notice it is a little, round, whitish scale. You will find that it is nearly circular, and on the top it has a little prominence, a very peculiar form that belongs to that class of scales. There are two or three scales that resemble it, but the little prominence is peculiar to it. They pile right on top of the tree right over one another. The leaves are starved to death. They simply look as if the tree did not have fertilizer enough. You will say that it got struck by the cold or that you had not enough fertilizer of the right kind. It is hard to

tell what is the matter with the tree. It is very readily overlooked. It has no particular season for breeding. You will find young and half-grown ones all the year round as long as the weather is warm enough. They may be dormant for a few weeks in cold weather. We should try to stamp it out, for it is very destructive and it will spread.

Mr. HEALY—Does it attack the leaves?

Prof. ROLFS—I have never seen it on the leaves. It usually attacks the young branches. My work with it has been just after the leaves have come on the tree. I would not say that it does not attack the leaves, but the especial damage is done to the limbs of the peach, the pear and the various forms of plum it attacks. It has not been known to hurt a citrus tree. It does not like the citrus.

Mr. HEALY—Have you ever seen it on the pecan or Japanese chestnut?

Prof. ROLFS—I know of no case that has been reported on those trees. I will say that on these trees there is a scale belonging to the same genus, but it is a larger insect.

Mr. HEALY—I heard a gentleman say to-day that he had Japanese chestnuts and that they made a perfect shell, but in the shell of the nut there was nothing but a little mould. That was all he could get. Now I got perfect fruit from my trees. Is there any insect that will cause that?

Prof. ROLFS—What are the conditions? Is it a tree standing off by itself?

Mr. HEALY—Mr. Brown will tell us about this.

A. H. BROWN—I have a row of these trees. I think there are ten or a dozen in a row. They are set in the center of a young grove, and receive the same cultivation that the oranges do.

Prof. ROLFS—I asked this question because, as is well known to horticulturists, the pistilate and staminate flowers of the chestnut are borne on separate trees, and if you happen to get a grove of trees that produce only pistilate flowers, there will be burrs without fruit. I have seen this happen with the wild chestnut.

Mr. BROWN—Where is the stock secured from which the Japanese chestnuts are grown?

Mr. ROLFS—I am not familiar with this. Mr. Taber may be able to tell us.

G. L. TABER—The Japanese chestnut is generally sent out as a seedling. There have been a good many grafting trees sent out and they were good, but the seedlings generally produce nothing. The nuts are generally about the same. As

to the stock upon which we have grafted the horse chestnut, the American horse chestnut will grow upon the chincopin, but I think the horse chestnut is most generally used as a stock when the chestnuts are grafted, but any chestnut can be used as a stock. As to whether Mr. Brown's trees are grafted or seedlings, I do not know that that would make any difference. If the trees were grafted it would depend on the kind of trees from which they were grafted. I have some seedlings that have produced well. For the first year or two there were a good many nuts, like Mr. Brown mentions. There was no kernel in the nut. For the last few years we have had good fruit.

Mr. BROWN—Did they not form a perfect shell?

Mr. TABER—They did.

J. T. STUBBS—I would like to make a motion for the appointment of a committee on legislation. I would ask that a committee be appointed to look into the legislation against the importation of vegetable insects. This morning we have heard a good deal about trouble with diseases and insects, and the evidence is that most of them have been imported into the United States. Some states have a quarantine law against the importation of these insects. It may be necessary that we have legislation on that subject to make us safer. I would ask that a committee on legislation be appointed.

Mr. HEALY—if I understand you, it is a committee to investigate and report upon legislation for the purpose of restricting the importation of diseases and insects.

Mr. STUBBS—Yes, sir.

Mr. MELLISH—Would it not be well to limit the duties of that committee?

Mr. STUBBS—Their duties would be limited, being confined to the investigation of legislation on the importation of disease and insects.

Prof. ROLFS—in the paper that I presented to the society I mentioned the fact that we have a number of states in this country that have passed such laws. Some of those laws are good and some are not good. The idea I had in mind in presenting this report was that we might appoint a committee to ascertain what laws on this subject are in force elsewhere and what effect they had; to consider the advisability of the adoption of restrictive laws in this state; possibly to recommend something of this kind in this state; at least to bring the subject before the society in shape to be discussed intelligently.

Motion carried.

## Fertilizing Orange Groves.

Prepared and read by Benj. N. Bradt, of Huntington, Putnam county, member Standing Committee on Fertilizers.

My experience with fertilizers has been with their use in orange groves only. I can give but little positive information and shall confine myself to a few suggestions, hoping to provoke discussion and elicit information from the members present.

It is generally accepted that the three principal elements required in a fertilizer are potash, phosphoric acid and nitrogen.

What we want is to obtain these elements, either separately or mixed, at the lowest market price and in the best form.

What is the best form of each of these elements, and what is the best combination?

It is commonly believed that sulphate of potash is the best form in which to apply potash to orange trees. Has it been proved by exhaustive experiments?

We get phosphoric acid from various sources and in various forms. Which is the best?

The question of nitrogen is still more important. It is probable that the health of our trees and the quality of our fruit is affected by the quantity and form of nitrogen which we apply more than by either of the other elements. What is the best form?

From my own observation I venture the opinion that nitrogen applied in crude waste animal materials is detrimental to the quality of the fruit if not to the health of the trees.

If we resort to pure chemicals what shall we use?

It seems to be established beyond question that we can grow a large part of the required nitrogen, in our younger groves at least.

The beggar-weed and cow-pea undoubtedly gather free nitrogen from the air and store it in both their tops and roots

While I believe most fertilizer manufacturers are honest, under present conditions we are at their mercy. Our fertilizer law does not give us adequate protection.

There is a solution of the problem which can be brought

about by our Agricultural Experiment Station or by some public-spirited citizen of means.

That is, by making comparative tests in the grove for a number of years in succession of different formulas.

When we have decided upon the best formula and the best sources from which to obtain the needed constituents we can go to the manufacturers and ask them to compete for our patronage. We shall need no elaborate law to protect us.

Will not the method of fertilizing and cultivating our groves go as far, ultimately, in deciding the question of profit in orange growing as the method of marketing?

---

## Fertilizers and Fertilizing Materials.

---

Prepared and read by E. O. Painter, of DeLand, Volusia county, at the special request of the Society.

The question of proper fertilization is one of great importance to the orange grower and truck raiser of Florida, for in no state of the Union is there more need of it. There is but a very small area within our borders but that requires artificial fertilizing of some kind or other, it therefore behooves the farmer and fruit grower to study well this question of fertilization so that he can apply his manures in a manner that will give him an abundant crop and at the same time have none, if any, to go to waste. It has not been many years since commercial fertilizers were unknown to the majority of the tillers of the soil.

They had no need to study agricultural chemistry for they had but to prepare the land, plant the seed and an abundant crop could be harvested without the application of artificial fertilizers in any way. This practice has, as you all know, impoverished the most fertile fields and where once the vegetable life would spring up and reach out its branches and hold out its leaves to be kissed by the sun and be washed by the dews and rain from heaven, now refuse to grow unless properly fed by the hand of man. A continuous draught, so to speak, has been made on the bank of plant food and unless liberal deposits are returned it will not be long before bankruptcy and starvation will not only

stare the plants in the face but the "tiller" will have to seek other vocations or succumb to the inevitable.

"Necessity is the mother of invention." So when the soils began to fail to give forth abundant crops, man began to study the laws of nature and he soon discovered wherein the trouble lay and began at once to supply the needed plant foods.

Thus commercial fertilizers were invented and placed on the market. They were received with a good deal of incredulity by the husbandman who in his ignorance of chemistry could not understand how an inorganic substance could be converted into living matter. Necessity, however, compelled him to try it and to-day there are thousands and thousands of tons of chemicals annually used to increase the productiveness of the soil, and the increase is going to be just in that proportion to which the farmers and fruit growers are educated to their proper use. I do not mean that they should study to be chemists but they should understand the sources of various plant foods and their effects upon different plant life. I have tried to study it from this standpoint as it is the practical work that finally tells. The chemist can tell us that an orange tree contains certain per cents. of water, sugar, potash, phosphoric acid, etc., and we may have all of these at our hand, but without the aid of dame nature we could not produce a single fruit, but we can, with the aid of the chemist and the help of dame nature, grow trees that will give an abundant yield by supplying the necessary plant food which can be worked over by the trees and given back in the shape of "golden apples."

I hope you will not think that I am a chemist, for what I know about chemistry is so small alongside of what I do not know, that a "drop in the bucket" would be no comparison. As stated above, I have tried to study this question from a practical standpoint, and if any of the information given proves of value to even one person I shall feel repaid for my trouble. I do hope, however, that it may be the means of food for thought which will lead the growers to better understand the use of agricultural chemicals.

One of the most plentiful elements of plant food is nitrogen, yet it is the most costly, owing to man's inability to trap it and get it into shape to handle without great expense. It composes about four-fifths of the air we breathe and enters into the formation of all animal and plant life. Without ammonia it would be impossible to grow anything. Your soil might contain an abundance of potash in the most available form, the phosphoric acid might be there served up in the most appetizing form for plants, yet without ammonia there to start

and to stimulate, the plants would never unfold a leaf.

#### SULPHATE OF AMMONIA

is one of the best forms of ammonia, and one which contains the greatest per cent. of nitrogen of any substance we use as a fertilizer. It is a by-product from the manufacture of gas and coke, also from burning bones. The ammonia is liberated from the coal or bones by combustion, but before it reaches the outside atmosphere it is caught with the aid of sulphuric acid and held in the form of a salt. Thus an acid and an alkali, either of which would take the skin from your hands, are rendered a neutral substance and can be handled and stored with impunity. When applied to the soil in a limited quantity its effect can be quickly seen, as it is ready to be taken up by the plant as soon as it comes in contact with the moist earth or is wet by rain or dews. Some chemists contend that it changes to nitric acid before the plants use it, while others claim that it is taken up as it is. I do not claim to understand how nature effects these changes, but I do know that there is nothing that will kill vegetable life more quickly than an overdose of sulphate ammonia, or one that will put more life and vigor into a plant in a quicker time if properly applied than this same "salt," yielding about 25 per cent. of ammonia.

Nitrate of soda is the next in order. This is also a salt and is obtained from the west coast of South America. It is in a section where rain is almost unknown, so that the accumulations have remained unchanged. It is found in the form of rock and is generally near the surface. The overburden or top soil is removed and the nitre rocks dug out and loaded on to cars which are taken to a nitre works where the rock is crushed and put in large vats containing boiling water. The nitrate of soda soon dissolves, and in this way is separated from impurities. From the boiling pan the liquor is drawn off into evaporating vats. In that arid climate the water soon evaporates and leaves the nitrate of soda in crystals in the bottom and on the sides of the vat. It is then put in heavy sacks and shipped to all parts of the world. The action of nitrate of soda on plant life is very stimulating and quick, and for this reason is very valuable to gardeners whose crops are behind on account of late planting, cold or other causes. It is said to be very slippery, and if more is put on the soil than the plants require the rains will dissolve and carry it away. It does not adhere nor unite with the soil but remains dissolved until the moisture is evaporated from it. Sulphate of ammonia and nitrate of soda are the best forms of ammonia in a dry or partially dry season, owing to the fact that they require very little moisture to dissolve themselves. In fact, in Florida

they will condense enough moisture from the air to dissolve themselves. I know of a grower of oranges in Florida who ordered a sack of nitrate of soda, and when it reached his depot he refused to take it, claiming that it had been allowed to get wet and consequently ruined. He at once wrote the shipper that the wet sack of nitrate of soda was at the depot subject to his order. That if he could not ship him dry nitrate of soda he did not want him to ship any at all. This grower simply showed his ignorance of the nature of nitrate of soda. The high price of nitrate of soda has led some unscrupulous people to adulterating it, thus enabling them to double their profits. Common coarse salt is the agent used most frequently for this purpose, also kainit and sometimes sand. The salt and kainit can be readily detected by taking a small particle in the mouth. If it dissolves readily, leaving a cooling sensation, it is apt to be all right, but if it gives a salty flavor it would be well to have it analyzed before buying.

Nitrate of potash is sometimes used as a fertilizer, but its expensiveness keeps it from coming into general use.

Guano was one of the first forms of commercial fertilizers offered to the public. Its effect on the soil was wonderful. It is accounted for by the high per cent. of ammonia which it contained, together with phosphoric acid, the soil then containing plenty of potash. Repeated applications of guano, however, did not give the same results, and it was soon looked upon as a "stimulant" only, when in reality the cause was that it was a "one-sided" fertilizer. It is used to some extent yet as a source of ammonia in manipulated fertilizers, but the use of it is decreasing, owing to the guano beds becoming exhausted. Besides ammonia it contains phosphoric acid and a small per cent. of potash.

#### DRIED BLOOD

is also extensively used as a source of ammonia, and is obtained from the great slaughter houses where it is pressed, dried and ground and shipped to various parts of the country. It is one of the best sources of ammonia among the organic substances.

#### TANKAGE

is the refuse of slaughter houses that has been cooked and put under pressure to extract the particles of fat that it might contain, and is then dried and ground. In Florida it is known as blood and bone, and in other sections of the country it is sold as animal guano, but it is all tankage. There are several grades of tankage which are sold on the percentage of ammonia and phosphoric acid or bone phosphate that they contain.

It is generally the low grade that is sold to the growers, as the concentrated tankage is almost always bought by manufacturers and used in making their special brands. This, like guano, is a one-sided fertilizer, and its continued use without the application of potash would lead to unprofitable crops, if not disastrous results. It is so with all one-sided fertilizers.

#### AZOTINE AND AMMONITE

are animal waste from which grease has been extracted by being exposed to the vapor of naptha. These, like tankage, are bought up by manufacturers.

#### COTTON SEED MEAL,

Linseed meal and castor pomace are all the result of the manufacture of the different oils and are usually termed oil cake before it is ground. Every one in this country is familiar with the two kinds of cotton seed meal. One from the short staple and the other from the long staple cotton. That from the former being known as "bright" and the other "dark" meal. The bright is a little richer in ammonia than the dark, owing to the fact that it is freer from the hull. The hull of the long staple cotton is so soft that it is impossible to grind and bolt it all from the meal, thus giving it the dark appearance. The former is used a good deal for feed and consequently there is a larger demand for it, usually selling about \$4 per ton more than the dark, while in reality there is only about \$1.25 difference in their manurial value. Castor pomace should be used with care and should be kept away from stock. Linseed meal is used extensively as a feed for horses and consequently its selling price is usually considerable above its manurial value.

#### HOOF MEAL AND HORN SHAVINGS

are frequently used in manipulated fertilizers and they contain a large percentage of ammonia which the chemist can find, but which the plants have a hard time to unlock. For this reason it is rated as one of the poorest sources of ammonia for plant food. In fact I doubt if it would pay the growers of Florida to pay freight on it and apply it to their soils. This will account to some why it is that a fertilizer which has a guaranteed analysis of ammonia that seems high and that the chemist says is there gives such poor results when applied.

#### FISH SCRAP

is probably used more largely by eastern fertilizer manufactur-

ers as a source of ammonia than any other organic matter. All along the coast fisheries exist which annually turn out thousands of tons of "fish pomace" or "chum." The fish are caught, steamed and the oil extracted and the waste or pomace is dried and sold. Florida's coast is teaming with fish that could be utilized to help furnish fertilizer for the acres of vegetables within her borders. They could be composted with muck. The chief objection to handling them, however, is the smell and the army of buzzards that would have to be looked after. There are other sources of ammonia than those we have mentioned, but they do not generally enter into commercial fertilizers and are used but very little. All those named except the sulphate of ammonia and nitrate of soda are organic manures and have to undergo fermentation and decomposition before the plant food they contain is liberated, hence it takes considerable longer for their effects to show and in a dry season there is no show at all owing to the soil being thoroughly dried deeper than they have been applied.

In the above we have not mentioned any of the domestic or stable manures as we take it for granted that everyone knows their value.

Next in order in expensiveness to the agriculturist comes

#### POTASH.

Until recent years the only known source of potash was from ashes, which were limited, and as a great many of these were used in the manufacture of soap, the supply was inadequate for the demand. It was not until the discovery of the potash mines in Germany that a supply of potash could be had in sufficient quantities to meet the increasing demand. As to the origin and description of this plant food we cannot do better than to copy a few paragraphs from one of the German Kali Works' pamphlet:

"The Stassfurt salt and potash deposits had their origin, thousands of years ago, in a sea or ocean, the waters of which gradually receded, leaving near the coast, lakes which still retain communication with the great ocean by means of small channels. In that part of Europe the climate was then tropical, and the waters of these lakes rapidly evaporated, but were constantly replenished through these small channels connecting them with the main body. Decade after decade of this continued, until by evaporation and crystallization the various salts present in the sea water were deposited in solid form. The less soluble material, such as sulphate of lime or "anhydrit," solidified first and formed the lower stratum. Then came common rock-salt with a slowly thickening layer which ultimately reached 3,000 feet, and is estimated to have

been 13,000 years in formation. This rock-salt deposit is interspersed with lamellar deposits of "anhydrit," which gradually diminished toward the top and are finally replaced by mineral "polyhalit" which was composed of sulphate of lime, sulphate of potash, and sulphate of magnesia. The situation in which this polyhalit predominates is denominated the "polyhalit region" and after it comes the "kiese rit region" in which, between the rock-salt strata, kieserit (sulphate of magnesia), is imbedded. Above the kieserit lies the "potash region," consisting mainly of deposits of carnallit, a mineral compound of muriate of potash and chloride of magnesia. The carnallit deposit is from 50 to 130 feet thick and yields the most important of the crude potash salts and that from which are manufactured most of the concentrated articles, including muriate of potash.

"Overlying this potash region is a layer of impervious clay which acts as a water-tight roof to protect and preserve the very soluble potash and magnesia salts, which—had it not been for the very protection of this overlying stratum—would have been long ages ago washed away and lost by the action of the water percolating from above. After this clay roof is a stratum, of varying thickness of anhydrit, (sulphate of lime), and still above this a second salt deposit, probably formed under more recent climatic and atmospheric influences or possibly by chemical changes in dissolving and subsequent precipitation. This salt deposit contains 98 per cent. (often more) of pure salt—a degree of purity rarely elsewhere found. Finally above this are strata of gypsum, tenacious clay, sand and limestone, which crop out at the surface.

"The perpendicular distance from the lowest to the upper surface of the Stassfurt salt deposits is about 5,000 feet (a little less than a mile), while the horizontal extent of the bed is from the Harz Mountains to the Elbe in one direction, and from the city of Magdeburg to the town of Bernburg in another.

"It must not be inferred from what has been said that the various strata succeed one another in regular order. To be sure, they occur according to certain well-marked physical and chemical laws, which together with local conditions and geological disturbances, have fixed their relative positions, but as the order of formative influences has varied so have the results succeeded one another in interchanging strata, and one deposit is found here higher, there deeper, than another. At some few places, through refts or fissures, surface water has entered, and either entirely carried away the potash deposits or changed them into secondary products. Resulting from this latter action are beds of kainit, sylvinit

and other less important compounds, which from their very causation are only found in the upper strata.

"From what has heretofore been said, it follows that Stassfurt possesses a comparatively inexhaustible supply of potash salt. Further geological exploration may discover deposits similar to these at Stassfurt, but none such are now known to exist, and hence it may be said that practically 'Stassfurt' supplies the world with potash."

There are nine different potash mines, but they are all under the control of one syndicate, and to such an extent has the potash become in use that to-day these mines employ over 4,000 miners, and it takes nearly 6,000 laborers to manufacture the different grades of goods that come from the mines. The product that we are most interested in is high grade sulphate of potash analyzing from 90 to 96 per cent. Double manure salt, or as it is generally known, low grade potash, analyzing about 48 to 50 per cent. and kainit 22 to 24 per cent. sulphate potash, also muriate of potash, which shows about 50 per cent. of actual potash. Which of these four is the best for the grower depends on what he is growing and what kind of soil he is expecting to apply it. If he is in the garden business raising cabbages, lettuce, celery, etc., muriate of potash or kainit would be his best source of potash, the muriate being by far the cheapest form. I could not recommend it for application to fruit trees, although I know of it being used in a small way on bearing orange trees without any apparent damage. I have also known of the leaves and fruit being taken off an orange tree by an extra large dose of kainit. I am frequently asked which is the best potash to use, the high or low grade, to which I reply that if the place of consumption is not too far away from the seaport, I believe the low grade will give the best results for the same amount of money. The cost of potash per unit in both grades is practically the same ex-vessel at any seaport, but from that instance the cost per unit commences to increase in the lower grade. Where the freight does not exceed \$5 I should always recommend the low grade, for in my mind the magnesia that it contains is worth more than it costs.

Repeated analyses of our soils show a deficiency of potash, and if one will but stop and think a few minutes it will not be hard to account for it. Take an orange grove, and in nine cases out of ten where it has been fertilized at all it has had ammoniated goods to produce a rank growth and the tree has done it.

The majority of these fertilizers have no potash in them at all; the tree uses every particle it can get hold of, at the same time there is an abundance of phosphoric acid. With am-

nia and phosphoric acid being continually applied without any potash, it does not take long for one to be in excess of the other. The young tree can stand the deficiency for some time, for it is continually returning to the soil through its dropping leaves all the potash it has gathered, except the amount contained in the body and limbs of the tree. A different thing happens, however, when the tree begins to bear, for every orange that is carried away takes with it a certain amount of plant food, a large proportion of the ash of which is potash. A tree cannot continue to bear five to twenty boxes per annum unless there is a return made in some way. Recently I visited groves in different parts of the state that were old enough and large enough to bear from ten to twenty boxes each, yet the average crop was not three boxes. These trees were cow-penned, and had never received an application of potash except what little was left by the cow chips and decaying weeds. The fruit was not what would be called first-class in flavor and soon got soft and spongy.

In contrast to this, I have been in a grove of four acres from which 2,500 boxes of fruit were gathered and shipped; another of five acres, twelve years old, containing 216 trees, which yielded over 1,600 boxes; still another of forty acres which yielded the handsome crop of over 17,000 boxes. All these groves were fertilized with a fertilizer containing a large percentage of potash. I might also add that to my knowledge these groves have borne heavy crops ever since this plan of liberal fertilizing with strong potash manures has been followed, and the trees are now set with another large crop. Potash not only increases the productiveness of the tree, but it makes the fruit firmer, enables it to hold on longer, and improves the quality of the fruit, giving to it that delicate bouquet which leaves a pleasant farewell taste in the mouth that is strongly suggestive of more. Potash, however, like all the rest, can be overdone, and instead of tending to early ripening of the fruit it will retard it so much that the fruit will be very acid quite late. Tests have been made the past season with just this result. It should be the study of the orange grower to know what amount of potash can be used with profit and for the best results in the way of fruit.

All of the forms of potash are insecticides to a considerable extent, and in our garden, where potash was used liberally, the vegetables were not troubled with root knot. Kainit is an absorbent of ammonia, and is useful on this account to use about stables, out-houses, and in compost heaps, where the compost is for garden purposes.

There is as much difference in well fertilized fruit and that which has to shift for itself, as there is between well

fed stock and the scrubs which have to shift for themselves.

#### PHOSPHATE.

To one the mention of this word brings a smile, for he at one time owned phosphate lands, but sold at the right time. To another it means broad acres of pine forest underlaid with supposed wealth, but a poor bank account. They either did not get the "paying take," or they have not the means to develop this wealth and are too short-sighted to let some one else develop it. When phosphate was first discovered in Florida, many thought that the cost of fertilizing materials was going to drop way down, and many believed that all they had to do was to pile on the phosphate. How bitter the disappointment. Ignorance and a one-sided fertilizer again worked havoc with the pocketbook of the grower. To-day you can ride through the piney woods, and I will guarantee that you can find men that would not have the "durned stuff on this grove if you would put it on for nothing." Notwithstanding all this, phosphoric acid has its place, and must be used to properly develop and maintain plant life; for it is the connecting link that holds all vegetable and animal life together. You can not destroy it in any way.

The best source of phosphoric acid is still an unsettled question. We have a large list to select from. First, bones of all kinds, refuse matter of different kinds which also yields ammonia and potash. Canada, South Carolina and Florida have vast beds of phosphatic rock which can be mined very cheaply, especially the two latter states, so there is very little possibility of this element of plant food becoming scarce. Chemists claim that phosphoric acid is phosphoric acid wherever found, whether from bone or rock; but these same chemists will tell you that ammonia from one source is much better than from another. If this is so, why not phosphoric acid. All plants do not have the same absorption power any more than the animal kingdom. A goat will thrive and fatten where a bullock would starve. A black jack oak would grow and extend its branches in all directions, while an orange tree would soon die. This is all owing to their foraging powers and their ability to digest the food that comes in their way. From what I have seen, I believe the best source of phosphoric acid for the average Florida soil is from bone, and one of the best and cheapest forms being dissolved bone black. Acid phosphates give excellent results on heavy soils, hence their great demand in Europe and elsewhere. I am now watching the results of the use of Florida acid phosphate on orange

trees, and hope in the course of three or four years to know a little more about its value than at present.

#### TOBACCO STEMS.

During the last few years there have been thousands of tons of tobacco stems used in Florida with, I believe, general satisfaction when applied occasionally. A continuous use of them tends to make coarse fruit and soft wood. They seem to be an excellent tonic for the soil.

#### GYPSUM.

While it contains no plant food of itself, it is valuable. It has the power to catch the ammonia that comes down with the rain or is freed from decaying vegetable matter and hold it till wanted by the plant. Sometimes it has given as good results as a complete fertilizer on this account. But it will not do to depend on its doing this.

#### GAS LIME.

We hear of gas lime being spoken of as a splendid fertilizer. On this subject I will read what Prof. Caldwell, of Cornell University, says about it:

"Gas lime is composed chiefly of carbonate of lime and varying quantities of sulphate of lime (or ordinary land plaster), sulphite of lime, sulphide of lime, and more or less unchanged lime. The sulphite and sulphide are harmful to vegetation, especially the latter; but on exposure of the gas lime for a considerable time they become changed to the useful sulphate. The carbonate is of little value, and only the sulphate and the unchanged lime can be counted on as of any use."

"I do not consider the material as of much value for fertilizing purposes; for after due exposure to the air, to render the sulphide and sulphite harmless, the unchanged lime will also, in this time, be converted to carbonate, so that only the sulphate is left to be useful; and if I were going to use land plaster, I would prefer to buy it outright and know what I have."

"As an insecticide its use would be dangerous, because of its effect on the plant itself, unless it has been well aired, and for its usefulness in this respect, after having been thus aired, it would be the same as a mixture of plaster and chalk."

As gas lime can be had for 2 cents per bushel at the gas works at Baltimore, I should think that the farmers there would use it all up if there was the virtue in it claimed.

#### HOW TO COMPOUND FERTILIZER.

The compounding of fertilizers has been held up as a deep mystery; which has taken years to find out, etc., while the

acts are, that any one capable of working in fractions can compound their own fertilizer if they know the analysis of their goods. The delicate point is to get the right proportions to suit the crop on which it is applied.

I have prepared a chart, not for its accuracy or beauty, but to help you to better understand me.

| MATERIALS.                  | Ammonia. | Potash. | Phos. Acid.                             | Lime.  | Magnesia. | Moisture. | Chlorine. |
|-----------------------------|----------|---------|---|--------|-----------|-----------|-----------|
| 1 Sulphate Ammonia.....     | 25.      |         |   |        |           | 2         |           |
| 1 Nitrate Soda.....         | 18.      |         |   |        |           | 3         | 1.50      |
| 2 Dried Blood.....          | 9.5      |         |   |        |           | 16        |           |
| 3 Peruvian Guano.....       | 5.10     | 3.      |   |        |           |           |           |
| 2 Fish (dry ground).....    | 6.50     |         |   |        |           |           |           |
| 1 H. G. Potash.....         |          |         | 90 p. c. K <sub>2</sub> SO <sub>4</sub> |        |           |           |           |
| 1 L. G. Potash.....         |          |         | 49 p. c. K <sub>2</sub> O               |        |           |           |           |
| 1 Muriate Potash.....       |          |         | 50 K <sub>2</sub> SO <sub>4</sub>       |        |           |           |           |
| 1 Kainit.....               |          |         | 27 K <sub>2</sub> O                     |        |           |           |           |
| 1 Cotton Seed Hull-Ash..... |          |         | 83 KCl                                  |        |           |           |           |
| 2 Blood and Bone.....       | 6.       |         | 52 5K <sub>2</sub> O                    |        |           |           |           |
| 2 Bone.....                 | 4.       |         | 22 K <sub>2</sub> SO <sub>4</sub>       |        |           |           |           |
| 1 Dissolved Bone Black..... |          |         | 12 K <sub>2</sub> O                     |        |           |           |           |
| 1 Acid Phosphate.....       |          |         | 21 K <sub>2</sub> O                     |        |           |           |           |
| 1 Soft Phosphate.....       |          |         |   | 14     |           |           |           |
| 3 Cotton Seed Meal.....     |          |         |   | 22     |           |           |           |
| Land Plaster.....           | 6.       | 2.      |   | 16 a v |           |           |           |
| Tobacco Stems.....          | 2.5      | 5.      |   | 13 a v |           |           |           |
| Horn and Hoof Shavings..... | 7.5      |         | 3                                       | 16     |           |           |           |
| Gas Lime.....               | 0.3      |         |   | 55     |           |           |           |
|                             |          |         |   | 1.5    |           |           |           |
|                             |          |         |   | 2      |           |           |           |
|                             |          |         |   |        | 40.5      |           |           |
|                             |          |         |   |        | 11.       |           |           |

The first column gives the number of the different kinds of plant foods contained in the named material. You will notice that half of them contain only one element; eight, two, and only two contain the three elements of plant food. Now, if

you wish to compound a certain mixture, you first ascertain the analysis of your goods. Then you find out how many pounds of any material it takes to give you one per cent. For instance we take sul. ammonia analyzing 25 per cent. By dividing 2,000 by 25 we find that it takes 80 pounds to give one per cent. Now, if you want 3 per cent. of ammonia in your fertilizer you multiply 80 by three and you have 240 pounds. In the same way you follow with the potash and phosphoric acid. You may have a given amount of fertilizing materials and wish to know what it will analyze if mixed. For instance we will take.

|                                  | Ammonia. | Potash. | Phosph'c <sub>2</sub> acid. | Available phosphoric acid. |
|----------------------------------|----------|---------|-----------------------------|----------------------------|
| 500 pounds low grade potash..... | 6.75     | .....   | .....                       | ....                       |
| 500 " blood and bone.....        | 1.50     | .....   | 3.25                        | ....                       |
| 500 " fish, dried, ground.....   | 1.62     | .....   | 2.                          | ....                       |
| 500 " dissolved bone black.....  | .....    | .....   | .....                       | .4                         |
|                                  | 3.12     | 9.75    | 5.25                        | .4                         |

I do not give this as a model formula, but to show how it can be done. If you wish other proportions you have simply to proceed in the same manner.

It is hard for some people to understand the difference between a high and a low grade fertilizer. They figure that a ton is a ton, and if they can get a ton for \$20 it is better than paying \$40, but, poor souls, they are to be pitied.

Now we will make up a high grade fertilizer.

|                                  | Ammonia. | Potash. | Available phosphoric acid. |
|----------------------------------|----------|---------|----------------------------|
| 200 pounds sulphate ammonia..... | 2.5      | .....   | .....                      |
| 222 " nitrate soda.....          | 2.       | .....   | .....                      |
| 922 " sulphate.....              | .....    | 13.     | ....                       |
| 956 " dissolved bone black.....  | .....    | .....   | 5.20                       |
| 2.000                            | 4.5      | 13.     | 5.20                       |

Here you have first-class goods; now we will take—

|                               | Ammonia. | Potash. | Phosph'ic acid. |
|-------------------------------|----------|---------|-----------------|
| 500 pounds horn shavings..... | 1.85     | ....    | .50             |
| 500 " kainit.....             | ....     | 3       | ....            |
| 500 " blood and bone.....     | 1.50     | ....    | 3.25            |
| 500 " acid phosphate.....     | ....     | ....    | 3.              |
| 2,000                         | 3.35     | 3       | 6.75            |

It is not far behind the other in analysis, but what a difference there would be in results on a grove or garden.

Cheap and cheat should go together, for if the grower is getting cheap goods, either the seller or buyer is getting cheated, and which do you think it is likely to be? Fertilizing materials have a certain value, governed by supply and demand, and I would advise a grower to go slow in buying cheap goods; always buy on the unit of plant food, taking into account its source, and you will be more apt to get full value.

No one ever said anything truer than our friend, Rev. Mr. Phelps, when he said that the time was coming when the growers would feed their fruit trees to make flavor and quality, and this can only be done by judiciously using high grade goods.

## Discussion on Fertilizers.

---

JAMES MOTT—A good many of the fertilizers used in this state are frauds. I have seen orange groves that looked to me as though they would have been better off without it. I have a friend in Polk county; not long since I was there and

he told me that he put about thirty-five tons on seventy-five acres, and not getting the results from the fertilizer that he expected, he sent a sample to the state chemist and got his analysis. I copied the analysis the state chemist sent him; I also copied the analysis that they reported to be on the bag. From that same manufactory there was a sample sent to another chemist, as also samples of potash; I have the analysis of them all. Here is one that was attached to the bag: Moisture, 79 per cent.; phosphoric acid, 9 to 14 per cent.; available phosphoric acid, 7 to 9 per cent.; ammonia, 5 to 8 per cent.; potash, 7 to 10 per cent. The state chemist's analysis showed that the moisture was 140; insoluble phosphoric acid, 2.56; potash ( $K_2O$ ) 4 to 8. The potash was sold at \$23.37 per ton at Savannah; the chemist told me he did not weigh the salt in it, but he estimated it was 13 per cent. The card on the nitrate of soda indicated 48 per cent.; it analyzed 43 per cent.

H. W. O. MARGARY—It seems to me that this question of fertilizers is of interest to all. There is one thing we should take into consideration; that is, the question of soil. We have many different soils in Florida. We try to grow oranges on a soil in which some element is lacking; then we blame the fertilizer if the fruit is not satisfactory. Is it right for us to attribute the growth, or rather want of growth, to the fertilizers? I think the fault lies in a lack of knowledge of agricultural chemistry on the part of the grower. Why not appoint a committee of agricultural chemistry to study up the subject and give to members the benefit of their investigations, setting forth the needs of different soils at different times? We take a grove and put one kind of fertilizer on it one year and it does very well that year and we get a large crop; perhaps the same fertilizer is put on again and there is then no growth and no fruit. Why is this? I am piling on fertilizer and there are no good results. We should examine the soil as well as the fertilizer. A year ago I took a few navel trees and gave them each twenty pounds of lime. The fruit is holding well now, but I do not know what the result will be. This was only an experiment. I say again that the question of soil should enter largely into the consideration of fertilizers.

A. T. CUZNER—I was very much interested in the paper read by Mr. Painter. He doubtless knew what he was talking about, but I have not the least doubt that the majority of persons present did not understand, when he got his charts out, what he tried so hard to explain, viz: The nature and essentials of a perfect fertilizer.

The subject of fertilizers is a very obscure one to the

average farmer, for the reason that the average farmer is a novice in agricultural chemistry. Now while it is not absolutely necessary that the farmer or fruit grower should have much knowledge of chemistry in order to raise good crops, still a knowledge of the chemistry of agriculture is of great advantage to him. He is continually hearing or reading of different fertilizing materials as containing so much phosphate, so much potash, so much ammonia, lime, etc., and doubtless queries to himself: What is potash, ammonia, etc., and what purpose do they fill in plant life?

The life principle of both animal and vegetable existence is dependent upon phosphate. When orange fruit is analyzed we find that it contains no phosphate except in the seed. It is required there because the seed is the reproductive result of the plant growth. In orange culture, for instance, such varieties as the Satsuma, which does not produce many seeds, experience will show, require less phosphate than other members of the citrus family. Again as to potash, what proportional amount is required by the soil for perfect plant growth, and what function will it fill in the economy of plant life? In regard to the amount of potash required, it varies with the condition of the soil. Some soils have a large percentage of potash in them. To say that all soils require a certain percentage of potash is very incorrect. Analysis of fruit and tree show that they contain much less potash than is indicated by the amount required in the soil. Potash, by its presence and the chemical changes it produces in the soil and the plant, is indispensable to perfect plant life. Potash is for the purpose, therefore, of enabling the fruit to mature itself—its body structure—so to speak; its trunk, leaves, etc. All these receive nourishment by means of the potash. It has a chemical action whereby the different materials are changed from one condition to another to suit the fruit. Potash is a vehicle. It is a means to an end, and has very little manural value as a fertilizer, as we understand manure, but it does just what gastric juice does in animal life. When man takes food into his stomach, the gastric juice comes in contact with it and enables the substance taken into the body to be digested and assimilated, and separates the different parts, each particular part to its particular end. Potash has largely the same effect in the vegetable economy as the gastric juice has in the animal economy, only more varied, and a soil that is not well supplied with potash will not produce good vegetable growth. In all fruit, with but few exceptions, phosphate is for the purpose of reproducing the individual plant. No fruit can have seed with phosphate. Phosphate has also a stimulating effect on plant life.

In regard to lime: There is a great many soils round where I live and the orange grows there most magnificently. In our shell hammocks you dig through the ground and it is like digging in some of the mountainous valleys of New York; there there are more stone than soil, with us more shells than soil; yet we get good oranges from these shell lands, and I think it is largely due to the lime. There is a good deal of phosphate in oyster shells as well as lime.

We should take into consideration the different uses of these different materials. Phosphate is for the purpose of enabling the vegetable to reproduce itself. Ammonia is nothing but nitrogen. Ammonia is the form of nitrogen that is most valuable in plant life. The air is full of nitrogen and we can get largely of ammonia from the atmosphere, but plant life needs assistance to get this nitrogen. If every grower would devote a little more time and study to the elementary principles of agricultural chemistry, we would not be so much at the mercy of the fertilizer dealers, or at such a loss when and how to fertilize.

G. P. HEALY—Mr. Lyman Phelps has told us again and again just what this gentleman is telling us. The orange grower is supposed to pay double for everything he gets, and that is all there is to it; he wants fertilizer and he pays for it. A fertilizer man with a box of "two-fors" in his pocket can take in the Florida orange grower, and the man that is not an orange grower can sell him fertilizer and make him think he gets the best thing in the world. He does it every day, does it all the time. I can convince any man that no fertilizer factory in the United States can mix a ton of fertilizer on the floor with a shovel better than I can. A negro will mix a ton an hour and work ten hours a day and it is just as good fertilizer as furnished by the fertilizer companies. This is no question of speculation. The agricultural stations in the United States and in foreign countries are telling the producer that he can manufacture his own fertilizer at from \$20 to \$25 a ton and obtain an article that will analyze as high as any fertilizer that he can buy. After buying the material you can mix it for 10 cents a ton.

It seems to me that the vital question of fertilization to-day is fertilization by indication. When the orange grower gets so that he can go into his grove and say whether it needs potash, ammonia or phosphoric acid, when he finds out what it does need, he has saved one-third to two-thirds of his money. Mr. President, it seems to me that the question of fertilization by indication is one that should be carried a great way and should be better understood. When it gets to the point,

where every man is his own tree doctor, or there are tree doctors who can tell a man what his grove needs, then we will get the science of fertilization down to where it ought to be. It is a great mistake to assume that all lands should be fertilized alike. We have lands that will by no means bear so-called complete fertilizers. Our insects and our diseases can almost all of them be traced to the use of fertilizers. This is the side of the question I would like to have brought out in this Society. We are all making mistakes, but when the time comes that man can go out into his grove and say whether it needs potash or not, and when he knows that it needs potash, will he go and buy ammonia to get the potash? I believe some would, especially if the fertilizer agent with the box of "two-fors" came along.

J. E. FULLER—I think when we get home we will know what not to do. But some of us younger members would like to know what to do. We would like to hear of the successes as well as of the failures. I know we have not been doing the right thing. We want to know what is right. We would like to know the results you have obtained in the fertilization of pine lands. We would like a chapter of practical experience. We came here to learn how to fertilize properly.

A. H. CAREY—I want to correct one idea that seems to prevail; that is, that all fertilizer dealers are frauds. It is also a supposition that there is a great profit made in fertilizers. I manufacture fertilizers and live in Orlando and I will guarantee to furnish any man with any grade of fertilizer that he may name if he will pay for the material laid down in Orlando the exact cost and will give me \$5 per ton for my trouble. If a man buys a low grade of fertilizer and pays a high grade price for it, then he is undoubtedly paying \$10 or \$12 too much; but if a man buys a high grade fertilizer made from high grade material and pays high grade prices, then the dealer cannot get in \$10 or \$12 profit.

A. G. AVERY—Nearly everything so far that has been said has been on chemical fertilizers. Nothing has been said about cotton seed meal. I think cotton seed meal should rank among the best fertilizers we have and practical men I have talked with agree with me in this. I came here nine years ago and became interested in the cultivation of citrus fruit, and from the best information I can get, cotton seed meal has given the best results.

Mr. PHELPS—The gentleman third last speaking told us about the seed being the reproductive factor of the orange. He should have gone further and told us what an orange is and the necessity of having a perfect bloom in order to have

perfect fruit, and what elements were to produce that bloom; he should have gone on and told us the effects of oxygen in the atmosphere and what it is that makes the seed produce itself, and I deny that it is phosphoric acid. If we are going to have elementary instruction we can go and buy a book for 50 cents to cover all these points.

JOHN W. HARDING—I would like to ask for information, of Mr. Phelps, who seems to be quite versed in the chemistry of fertilizers.

Mr. PHELPS—I asked the gentleman third last speaking to answer certain questions in reference to the elementary fruit. I would like to hear from him.

Mr. CUZNER—Mr. Phelps asks such a comprehensive question and one that requires such a comprehensive answer, that I beg to be excused. He wants me to make an answer as to what chemicals and what amount it requires to make an orange tree bloom, whether phosphoric acid, soda, potash or ammonia, and I am sorry to say I am not in a position to answer. I cannot tell him how much potash to use to make a good bloom. There are a good many things that enter into such a question as Mr. Phelps asks me to answer and I am sorry to say I cannot answer.

Mr. HARDING—Now my question is this: Whether there are not certain processes of nature which cannot be understood and cannot be analyzed by any knowledge. I have been in Jaffa and seen the Jaffa oranges and I suppose the Jaffa buds were brought over here and put in your orange trees and you have the Jaffa orange, but our Jaffa orange is different from *the* Jaffa orange. You have improved upon it. Will Mr. Phelps tell me if he can indicate by analysis of the grape what soil produced the grape? Can your chemistry explain those wonderful processes of nature by which one grape growing in the same vineyard will be entirely different from another growing within a few yards of it?

Mr. PHELPS—I will answer that question by asking another. Can the gentleman tell me why two children, born of the same parents, living in the same house, eating at the same table, are so different in disposition, in taste, in character? The best chemists are my trees. I believe to-day that there has been more progress in chemistry in the last five years of benefit to such bodies as this than was made in previous years.

Mr. AVERY—The chemistry of agriculture is very different in various localities, especially in California and in Florida. We know that the chemicals we are using are expected to

produce certain results, but the results depend upon the soil, the season and the rain they have.

D. GREENLEAF—A request was made a short time ago by a gentleman that the members of the Society give some personal experiences and while these discussions in regard to chemistry are all very well, to the great majority of us they are a little obscure. About seven years ago I put in a very large irrigating plant; I got good results from that; at the same time I sent on and got a few tons of land plaster; I found that it was very beneficial, that grass sprang up and while there is very little plant food in land plaster, I thought the result justified me in sending for a large amount. I was interested in the phosphate discovery. I sent on and got fifteen tons of the Florida phosphate just as it was taken from the ground; the first that I put on had not been ground and in sixty days the effect was marvelous. The trees made a large, vigorous growth and parties who had been through the state said they had not seen anything like it. The results have been mainly successful in my experiments with this phosphate. For five years I have applied nothing else and to-day my grove is as vigorous and as fine as I could ask for, and I think we have right here in the state as good a plant for food as there is in the world and that as a rule it is the best thing that can be put on an orange tree. My fruit has brought the highest prices in the Northern markets. I merely give this as information. The front of my grove is clear hammock, but where I made the first application was light sand and about twenty feet above the level of the water. Part of it is in scrub. The phosphate I used is called soft phosphate. Others have used it with very marked effect.

J. W. RUSSELL—I think we are on the right move; that is, to give our personal experience. My process is to open up furrows, put in stable manure and cover it up immediately. On part of my land I put commercial fertilizers. The stable manure has done the work. We have got to use something that will pay us better than manufactured fertilizers. Some gentleman has been running down stable manure. We have worn out the country by the use of manufactured fertilizers. I say that stable manure and our own fertilizers that we can get in Florida are the best.

JOHN E. STILLMAN—I have been traveling over this state for three years selling fertilizers. I have found people who have condemned every brand of fertilizer. Some maintained that ground corn meal was the best fertilizer; some, that stable manure was the best; some claimed that sawdust was the best,

and I think a good many of the growers have the impression that all fertilizers are bad. But we cannot ignore the valuable results obtained from chemical fertilizers, and the important part they have played in our recent horticultural development; to do so would be to take a step backward; if we were to do this we might as well stop holding horticultural meetings.

Mr. HEALY—I have known the gentleman last speaking for a number of years—ever since he was a little fellow. He was a good sort of a boy, and always was so until he went into the fertilizer business. Before he went into that business I met him quite often, and we used to exchange cigars and whiskey. After that he only gave me one cigar and a drink once. I did not want any more. I do not know what kind of whiskey he carries now, as he does not sell me any more fertilizers.

H. B. STEVENS—I have been to quite a considerable expense in getting out muck and applying it direct from the lake, and no one who has been through my grove will admit that it is a good fertilizer. I applied muck two years ago but have not done so since.

A. D. MOORE—I believe this is turning into an experience meeting. I am interested a little in oranges; I also plant a good many vegetables. I use chemical fertilizers, and I have neighbors that use them. I have one neighbor who thinks he can afford to haul phosphate twelve miles from the mines. I tried to save stable manure myself; my stables are full of it now, and I thought perhaps I could find something to do with it. I have about come to the conclusion to throw it out in the field and let it rot. In connection with the use of chemical fertilizers: A good many parties burn off their land. I break my land with a two-horse plow, as deep as the stock can pull it. I put chemical fertilizer on in the spring. I have made some money out of my crops.

Mr. MARGERY—Each man's land requires fertilizers according to its needs. Whenever we find an orange growing near a manure heap we find the tree scaly.

S. S. HARVEY—I think the most important question this society can investigate and discuss, is the question of fertilizers. I have an opinion on this subject formed from experience, that I wish to call attention to. You can take a piece of our Florida land, plant out a grove, feed it with the best commercial fertilizers, continue to do so until the trees come into bearing, and you may have the finest fruit; but continue this same treatment for a number of years; continue to give it the best of commercial fertilizers in any quantity you see fit, and your trees will fail and your fruit become worthless. There is an

element of plant food that you cannot analyze, that is necessary to the tree and fruit. I do not object to the use of commercial fertilizers; I advise the use of them, but not exclusively.

I have some of the very best fruit trees in the state, and I have used very little commercial fertilizer—may be not as much as I should have used—but I am confident my trees are the better for the use of the fertilizer that came from the stables, and to my mind the man who talks about throwing away stable manure, talks about throwing away his money. Per unit, there is no plant food so expensive as ammonia, and your stable manure produces ammonia in very large quantities, and the man who throws it away or burns it, as I said before, throws away money.

I am a believer in muck. I believe that it furnishes a plant food that you cannot purchase in commercial fertilizer. After your grove has been burnt out by the continued use of commercial fertilizer, give it a coat of muck, and you will find that it will produce a decided improvement. It is an experiment you will be well paid for.

The man who depends exclusively on commercial fertilizers, who makes up his mind nothing else will do, will get left. The man who has plenty of stable manure and uses it freely will improve his land and his grove, and will always be in luck.

Mr. MOORE—I think the last gentleman on the floor is correct. We must have a mixture. I want to say one little thing about soft phosphate: I have had ten years' experience on Florida pine lands. I tried soft phosphate (and I have not any to sell) and it is as good or better than other materials from which we get phosphoric acid. I put it on orange trees exclusively. Mr. Greenleaf has spoken about the value of soft phosphate for shell hammock land; this is about as good land as we have in Florida, and the soft phosphate should have earned a good recommendation there if anywhere, but it gives very satisfactory results with me on pine land. I had a tree standing very near a stable, and a neighbor said to me "That tree will die." I told him I did not see why, and he replied that the stable manure would kill it, and that he was surprised that I did not know it, being as smart as I was. I wish all my trees would die like that one. It is growing beautifully. I have applied stable manure and muck several years with success.

L. MONTGOMERY—I use a great deal of stable manure. I keep more stock than most people in Florida. I keep fifteen head of horses. I use stable manure, and think it better than anything else in the fertilizing line. My manner of applying

stable manure is to put it on at any season of the year, and to spread it broadcast between the rows of trees, say about six feet from the tree on each side, and cover the ground. About twice a year I put on this manure, and with it about half a ton of dissolved bone to the acre. I use this for the reason that I get out of it the sulphuric acid necessary. I do not think there is a grove better than mine in the whole country. For five or six years I have used only stable manure and dissolved bone. I use stable manure all the year. This fall we had a great deal of broom sedge put in my stable to be tramped up, and I used this. Those are the fertilizers that we use.

W. G. PECK—The gentleman made the remark that he used dissolved bone in order to get the sulphuric acid. This is an important question as regards orange culture, and I hope that during this meeting that point will be brought out..

Mr. MONTGOMERY—In dissolved bone you get quite a good deal of sulphuric acid. In the dissolved bone, I believe that the proportion of sulphuric acid—that is, the amount of sulphuric acid to the ton of dissolved bone, is 600 pounds. When your land has much vegetable fibre such as you get in stable manure, dissolved bone is better than anything else. Now, if you use a phosphate rock you do not get the sulphuric acid. I do not know whether it takes 600 pounds, less or more; about 800, I think. I should say that the sulphuric acid would be of the same value regardless of the substance it was mixed with. You get a better fertilizer out of bone than you do out of rock. I think that Mapes does not use any rock at all. I think he advertises this fact. I know that sulphuric acid is sulphuric acid regardless of the place you get it, and no matter what you mix with it. I used the Charleston rock a good many years ago, and gave it up as not a good investment. I have used acid phosphate with cotton seed meal, but settled down to stable manure. Do not disturb your soil very much. You can cultivate an orange tree too much. I plow my grove over in November every year, put on a good coating of bone and manure and turn the soil over, run the cultivator over it, and then do not disturb until next year. Bermuda grass growing near small trees is not a good thing, and does not help the tree at all, but after they get bearing it does them good.

C. A. BACON—I have a white man working for me. The other day I made a remark about stable manure which applied to cow manure. He said: "We do not call cow manure stable manure." He seemed to consider horse and cow manure altogether different.

Mr. PECK—I call stable manure horse manure altogether..

We never use the cow's manure. Stable manure comes from horses, and I find that the more I put it on the better the plants thrive.

Mr. HEALY—I would like to ask Mr. Montgomery what properties he proposed to get from stable manure by using acid.

Mr. MONTGOMERY—We do not expect to get any chemical fertilizing properties out of it. The stable manure, as known by everybody, has a great deal of ammonia, which is fixed by combining with the acid.

Mr. HEALY—I do not think stable manure has any such value. The analysis of average manure, according to the record which is to be had at all the stations in the United States, places stable manure as practically worthless. There is nothing in the stable manure, by the analysis of all the agricultural stations in the United States and in Europe, that gives it a place as a fertilizer. I will admit that it contains ammonia, but that is all. There is no potash nor any phosphoric acid in stable manure; or rather, they tell us this scientifically. I have used stable manure, and the experience has been enough to teach me to let it alone. The question has been how to fix the ammonia in the stable manure. Some use land plaster. Lately there has been a move made in the way of trying mucks to fix ammonia; that is one of the best methods, and I suppose it is because of its cheapness. I do not think it makes any difference how you apply your stable manure if you fix a large per cent. of the ammonia. If your land is lacking in potash or if it lacks phosphoric acid, you need not put stable manure there with the idea that you are going to get any benefit.

G. H. WRIGHT—I do not believe that we have a fertilizer in Florida that is any more valuable than stable manure. I am using it, and have been for some time and find it satisfactory. The question is how to get stable manure.

OTIS RICHARDSON—I rise to say a few words and ask a few questions, perhaps, as a young grower. I have been some twelve years trying to raise oranges. I have used the nostrums of all kinds of doctors to make that grove what it is, but I do not get good results from it. What is the matter? The seedling trees are doing best. I want a tree doctor, and we want a medical institution to educate doctors and send them around to look at our trees and get the right remedy and apply it. I have lost faith in most things recommended, because they have failed me. Cotton seed meal started my trees finely, and I have used muck, cow droppings and stable manure. But the grove is not bearing satisfacto-

rily. I have tried soft phosphate with no result whatever, and, of course, I did not continue it. Some of my neighbors living on better lands are cowpenning their groves. One man has a large flock of goats. He is cow-penning with goats. They are getting splendid crops of oranges while I am not. I have a few trees near a stable where I had manure piled up year after year, and the trees are blooming every spring and look as though they were just starting out for a hundred years. I have not got a cow tied to every tree. If I had I might get good results. I am satisfied that all the patent medicines for trees are altogether unequal to the task of giving us a good crop of fruit and trees that will last one hundred years. I believe they are stimulants, and for a short time give good results. The trees want more humus; they want more plant food, and it seems to me that there is nothing better than the vegetation grown by the ground and milled by the cow. All these other things may be good as aids but we must fall back on stable manure. There is nothing we can carry to the ground that has as many ingredients as stable manure. If some gentleman will tell me what to put on my grove, I will listen to him, and will be glad to hear his opinion.

O. P. Rooks—I have been very much interested in the remarks of the last speaker. I believe that success in fruit growing and in agriculture depends upon animal manure, and in all those sections where the most success is had in keeping up and improving lands, it is from that source. The gentleman asks for information as to how to make his trees bear. Two years ago I constructed a portable cow pen about eight by ten feet, with a gate leading into that pen. I took my cow at night and put her into that pen. I put the pen between the trees, and for from two to three weeks I kept the cow in that pen. I started at the beginning of a row and went through the grove with the pen. The results were marvelous. The biggest crop of oranges that were ever seen in that neighborhood were produced from those trees. That is the result of the cow-penning process. The oranges were as good as any in the neighborhood, and I got fair prices. I have used chemical fertilizers until I am almost "broke." I shall use the cow pens in future.

T. K. GODBEY—I wish to relate how I raise my oranges. I am a practical man. I am my own tree doctor. I think I know what the matter is with a tree when it looks badly. I have here specimen oranges which I wish to present to the society. The trees on which they were grown are thirteen years of age. They never had a spoonful of chemical fertilizers. They have been raised entirely on stable manure,

except that the chickens roost in the trees. The oranges I have here were not selected; simply taken as they came. My object was to see if I could preserve oranges, and I put some away, and when the time came I opened them, and they looked pretty well, and I want to show you that oranges can be grown with stable manure at Waldo. I have tried phosphate on my trees, and I have tried potash on some trees as an experiment. I could not tell where I had put it. The fertilizer I did buy was bought because I cannot buy all the stable manure I want, nor make it all. I have used blood and bone, and still use it to a small extent. I have made a good living raising fruit in Florida. I commenced without a dollar, except a piece of poor land. I have supported my family, and I have as nice a place as anybody about Waldo. I sold my oranges last year at an average of \$1.10. Now, that is my experience and the result of stable manure. I wish to bring the oranges up and present them to the society. Those oranges were picked the first day of January last, and preserved by a process of my own, which I am not free to give away just now.

Mr. PECK—A great variety of opinion has been advanced this afternoon. We have not stable manure around our place so I thought I would give you a formula I have used and with very good results on poor pine lands. I purchase the material myself—sulphate of ammonia, sulphate of potash and acid phosphate. Possibly better results might be obtained from bone black, but I think if anybody who has a poor piece of land and wants a fertilizer that will do good service, will take that kind of material and get somebody to mix it for him, or do it himself, and will use about 5 per cent. of ammonia, 7 to 8 per cent. phosphoric acid, and 8 to 10 per cent. actual potash ( $K_2O$ ), he will have a fine fertilizer.

Mr. BACON—This has been the longest half-day I ever experienced, but I have learned some things. You have allowed the other gentlemen to say a few words, so I hope you will allow me to do the same. I am a humus man, a stable manure man and a cow manure man, but at the rate oranges have been selling I cannot buy chemical fertilizers. Some seven or eight years ago I went into the humus business. I purchased quite a quantity of pig manure from neighbors that did not want it, and dug trenches round my trees and poured it in, and at the same time I covered my grove with decayed vegetable matter. I never had such a crop of oranges. They produced the most astonishing crop of fruit, and every year since then I have been so poor that I have not been able to haul the mulching. Every year that I have not had

time to haul this mulching, as much as I would like to, I have occasionally bought a few tons of fertilizer because it is so handy. I think I have been a fool for doing it. I should have bought another horse and kept him hauling old vegetable matter. I think I would have saved money. Use every means that you can to save money and keep it in the family. I do not wish to make any remarks, but I believe in humus. They have some beautiful groves at DeLand. I go to different parts of the east coast and I see such beautiful trees, and the rows are so straight and the fences so pretty; but they do produce large quantities of good fruit? I believe not. I say I believe in humus, and if we keep our ground covered with this we will have good results. With an orange grove completely covered by decayed vegetable matter, will not potash keep that grove in good condition?

SEVERAL MEMBERS—Yes; yes.

Mr. MOTT—I believe in cow-penning. I feed my cow with crab grass, hay, cotton seed meal, and throw a little lime in the tub in which she drinks. No fertilizing manufactory could mix a better fertilizer than that cow does.

---

## Irrigation in Florida.

---

Paper read by A. J. Kingsbory, of Winter Park, Orange County, Chairman of Standing Committee on Irrigation.

I believe there is an irrigation plank in the platform of this State Horticultural Society. But in the minds of many still lingers the question: "To irrigate or not to irrigate." To others who have settled affirmatively this first question, a second one presents itself: "How to irrigate," and perhaps a third one: "What to irrigate."

Of these three practical phases of the subject I propose to speak particularly in this report. I wish, however, at the outset, to call to your remembrance the very instructive and in every way admirable paper on irrigation read before this body last year by Mr. Hamlin.

This paper was the initial report on this all-important sub-

ject, read before the members of this society since its organization. I should like that paper to be considered introductory to what I now have to say. Its condensed presentation of the history and extent of irrigation, its conclusions and practical suggestions are all so good and so complete that I do not now need to touch at all on the same lines. But inasmuch as they are important lines and belong to the subject, I make the request that you all keep the paper of the former committee well in mind.

I go back now to the fundamental inquiry: "Shall we, here in Florida, under our peculiar conditions, engage in irrigation?" I see members of this society before me who have settled this question some time ago by installing a plant for this purpose, and I doubt if there is an owner of an irrigating plant in this house who regrets the investment, providing it is of ample capacity and its operation has given him no trouble.

The total rainfall in Florida averages about 54 inches. In a cooler latitude, where the loss by evaporation from the ground and from vegetation is much less than in Florida, 54 inches of rainfall per annum, if properly distributed, is generally sufficient for the usual needs of growing crops. But in this state the rainfall is not distributed uniformly either geographically or in point of time. Mr. Demain's reports, and statistics obtained from individuals located at various points, demonstrate the fact that some sections receive a great deal more moisture than others. But here, with our conditions of sunshine and heat and light soil, even were the rainfall evenly distributed throughout the state, all cultivated crops would still lack sufficient moisture to develop their best growth and set and mature a maximum amount of fruit.

It may be said further, that there is in reality but a very small percentage of Florida's improved lands which, during the growing season, receive sufficient to accomplish the best results. Our rainy season usually covers a period of perhaps six weeks. During that time all vegetation seems to be in one mad rush and scramble, each plant vying with its neighbor in luxuriant growth, flowers and fruitage.

It occurred to me some years since that these conditions might be made to exist eight months in the year instead of six weeks. In spite of the protests against this way of doing from some of the oldest and most experienced agriculturists and horticulturists, I persisted in the conviction, and the position I then held and still adhere to has never met with discouragement when accompanied by good judgment.

The citrus family and nearly all other fruit trees, forage

plants, the small fruits, shade trees, vegetables, and I don't know that I would omit scarcely any member of the vegetable kingdom, are glad to put on their finest and gayest attire of thrifty growth, producing fruit and foliage a greater part of the year, if you will only extend to them the conditions required. In the majority of cases the only element lacking to this condition is water.

There are homes and farms scattered throughout this peninsular from which the owners have struggled to secure a profitable income for the past 10, 15 or perhaps 20 years or more. These efforts have been in a measure rewarded; but I claim that the same or better results could have been accomplished in from one-fourth to one-half the time actually consumed if properly aided by irrigation. Had these same farmers expended the same effort upon one-fourth the amount of land, aided by irrigation, they would have had an independent bank account and would have lived a great deal better than they have been able to do without irrigation.

Nearly all of the older residents of Florida have had considerable experience in attempting to raise a variety of vegetables for home consumption. Many of their attempts were complete failures on account of dry weather. With an irrigating plant there are no "off seasons" for fruit and no dry spells to encourage insect life, drop the fruit, wither one's vegetables and courage.

What, in fact, can be more disheartening than to see one's toil go for naught? To plow and sow, but never reap? To plant and fertilize, cultivate and protect, watch and wait and wait again for the harvest so slow in coming, often so meager when it comes! Alas! too often the poor man gives up beaten, perhaps to try his lot elsewhere under different conditions. But his ambition for a second attempt is rarely equal to his first enthusiasm. He is older and the buoyant hope has vanished with the vanished years. It is evident that this lost hope is a serious evil to the man and the community. Progress is the child of courageous enterprise, and enterprise rests on hope. So I say the hope should be based on certainties, or at least on strong probabilities.

When we know that the total rainfall is in the average of years insufficient, that it is unevenly distributed geographically, being sometimes over 60 inches in one part of the state and less than 40 in other parts; that it varies greatly with different years, and that in the same year it may be excessive for a brief time, and almost, if not quite, totally lacking for months together at other times; when all this is borne in upon the consciousness of the cultivator, by years of struggle with

adverse conditions, is it any wonder that he is often overburdened and gives up the fight?

On the other hand, the wonder is that he so generally keeps on, with gritty resolution, and conquers a half-way victory in spite of fate. Nor is it strange that one who has seen the transformation wrought by irrigation should adopt the epigram of the Western wit who said: "Irrigation is not a substitute for rain. Rain is a substitute for irrigation, and a very poor substitute at that."

We may as well admit that, for all practical purposes, Florida is a semiarid country. It is not perhaps in such desperate need of moisture as the state of Texas, which was nevertheless defended by a native as lacking in nothing except water and good society. "Indeed," remarked a listener, "that is all hell needs." But we are not now studying the society question. That is not a question for this body of horticulturists. Yet the need of water, I claim, is fundamental. We must have it at easy command as a prime factor to general and continuous success in a great portion of our agricultural and horticultural operations.

This leads me to the point of calling your attention to the fact that all the work of the cultivator of the soil, in these later years, has been becoming more exact and scientific. What has come to be known as intensive farming is now the practice of the most progressive and successful men. The aim is to ascertain the best methods and then to carry them out to their logical extent. When, for instance, I see my neighbor's grove produces heavy crops of choice fruit, and does it regularly every year, and that he is prosperous in consequence of it; when I see that this does not come by chance, but as the well earned result of insight and skillful calculation, by adoption of means to ends, by thoroughness, by promptness—in short, by knowledge and industry—especially when I see such men formed into a society like this for mutual encouragement and assistance, I see the best possible proof of a rapid horticultural progress and knowledge. I see men who practice this intensive, this thorough and skillful method of cultivation. If I ask you what are the great primary essentials of plant life, you will say that they are four: earth, air, moisture and plant food. Two of these, earth and air, we take for granted. They are everywhere. The other two are often more or less absent, and have to be supplied. Just here is where the knowledge and skill come into play. The earliest cultivator took conditions as he found them, and raised a crop or not as it happened. He learned after awhile that it was wise to fertilize. In the totally arid

countries he learned to use water--when he could get it. Little by little, experience and science have been broadening man's intelligence. To-day, both fertilizers and water, enough and of the right kind at the right times, are recognized as equal factors in plant growth. If they are not naturally present, the cultivator of whom we are thinking finds means to supply them. He would rather cultivate 100 acres perfectly than 200 imperfectly, or even 40 or 20, or 10 or 5, or the smallest portion of the earth, and make it do its very best, rather than any larger amount that he could not be sure to supply with every needed advantage. And he would regard this preference not as a question of taste or pride, but as one of clear business sagacity, as so many of you have illustrated in your own experience.

But all this leads back again to the question of fact with which we began. I restate it in plain terms: Is the rainfall here in Florida satisfactory to you as horticulturists? Do you have enough rain for your growing trees and plants? Do you have enough rain when it is needed? When you most need rain do you have most? If you had the fabled power of old Jupiter Pluvius would you use it as capriciously as the custom has been of late? When you pray for three inches of rain are you not put off with a half. When you would be glad of an inch, do you get but an eighth? When you ask for a sweet shower, are not the heavens as brass?

At such crises--all too frequent, as every cultivator must need confess--how comforting it is to have a little genii by the edge of the lake or by the side of the creek or well, who, at one's command, will stir up the fires, open the valves and pour over the thirsty land abundant streams of life-renewing water. How vegetation revives under the magical touch! How it grows! How it blooms! How it bears the full fruitage! How it crowns the year with gladness!

In the light of this experience, and in view of experiences elsewhere, need I say more to prove that the man who irrigates a tract of land no larger than he can handle thoroughly and who practices intensive cultivation, is the successful cultivator? Of course, some men can handle more than others, either by reason of larger capital or better administrative ability, or both, but the amount is usually that to which a man can give his personal attention.

I urge this point especially in the interest of the small cultivator. He needs, to support a family, but little land if it be well cultivated, but here in Florida that little must be irrigated.

I pass on to consider the further question: How shall we ir-

rigate? This is still a problem in the minds of many, not only of those who do not own plants, but of those who have them. During the last two years I find many who have high pressure plants are using what we call the "California" system, running the water in furrows. The plan of piping with hydrants on corners of squares, from one to two hundred feet apart, which is coming into use here, lends itself readily to this system. The water, in almost any grove, can be placed in furrows and each hydrant's output be made to meet that of its neighbors. The land is so situated in some groves that it is advisable to put the water into a trough, having sides eight inches high. In these sides, and opposite the middle of spaces between rows of trees are little zinc gates and thus, into the furrows running from these gates in either direction, are dealt out miners' inches. This trough, running across the grove at the highest point, is kept filled from hose attached to the hydrants nearest at hand.

It is conceded that there are some reasons in favor of turning the water into furrows, where it can be done, during the blooming season perhaps, instead of delivering it into the air through nozzles. In this way less water is lost by evaporation and it goes at once down into the ground where it may chance to meet the moist sub-soil (if there is any) and spread laterally to reach a large part of the roots. The furrow method, under favoring circumstances, requires less labor.

On the other hand, the water will not run far unless the land slopes quite perceptibly, and even on quite a steep descent a greater part of the water is absorbed in the portions of furrows nearest the supply. There is no certainty of uniform distribution. If we had large ditches from which to draw our supply and uniform down grades, as the Californians usually have we should doubtless more generally conform to their practice. But even in that case our soil is so unlike theirs that there would still remain some difficulty about it. In the majority of cases here it is best to have a high pressure system, and having it the owner can deliver the water to his trees by either method, viz: forcing it well into the air by hose and nozzle, or allowing it to find the roots by the furrows.

In using hose and nozzle, however, it is not always advisable to throw the water over the trees or into the trees. It is wise at times to do so, but at other times it is well to deliver it on the surface, or at least by a horizontal stream under the branches. If the foot-rot is present or feared, the earth often accumulated too deep around the collars of the older trees should be forced away from them by a stream of water dis-

charged directly among these larger roots at the base of the trunk. Two or three barrels of water thus applied serves the double purpose of cleaning the collar roots and exposing them to light and air, also carrying water to the lowest roots, where ordinary rains or irrigation is never felt. This treatment is considered by many a certain specific for the dreaded foot-rot, and from my own observation I feel very sure that such is really the fact.

Probably the ideal way of irrigating is by the use of automatic sprinklers, the pipes covering the space to be treated so completely that the spray from the outlets will meet between them and the whole ground to be watered as by rain. All this, controlled in sections by valves, involves but trifling field work, and therefore more conveniently than other methods can be worked at night when sunshine is absent.

This, as I have said, is ideal and very closely conforms to nature's methods. But, unfortunately, when carried out on a large scale, it is very expensive in the installment; and in using, what is saved in the field is to some extent lost in the pumping station, for the water is forced from the sprinklers subject to great friction.

Nevertheless, for use in the garden and on the lawn, where large spaces are not usually covered, nothing is so convenient as the automatic sprinkling; and when putting in a hose and nozzle plant for the grove it is always in order to cover a good garden and the ornamental grounds by the automatic system. In a special installation for a vegetable garden I would always prefer to use the sprinkler.

Perhaps I should here say a few words about the motive power for working our pumps. At present I am obliged to say this, that wherever any large space is to be irrigated, or any considerable volume of water handled, steam is in most cases the only adequate power at command. Artesian water is supplied to some groves and other vegetation by its own pressure, where the land is less than forty feet above tide water. What motive power the future may bring forth, who can tell? We talk about wind power. We prophesy the further triumphs of electricity. We dream of concentrating the rays of the sun by reflectors. We experiment with gasoline and other mineral oils and with hot air. We fret unceasingly at the inventors for delaying the great discovery which will drive a more perfect pump than ever yet known and lift our lakes where, at our pleasure, they will flow almost as cheap as air through our fruitful groves and gardens. Yet, after all, when we have to do real work, and do it to-day, for us here in the woods, we know of no sure reliance but steam.

As to times and seasons, there is no period in the life of an orange tree when it requires water as it does during the blooming season. Just previous to this critical time it has been dormant and the soil as a rule is comparatively dry on most of our elevated lands. The tree suddenly begins to put out a hardy new growth, as well as bloom, covering its entire surface. The chances are that moisture is wanted to bring out the growth and fully develop it, including the bloom and its setting. Then we should irrigate, and irrigate heavily, not by continuous, daily applications, but by giving the grove a thorough wetting and then stopping until the practiced eye sees in the tops of the trees the slightest inclination of the new leaves to curl. This may occur in a dry time, from six to ten days after a thorough irrigation. Then it should have another wetting like the first.

With surface water to be found at varying depths, from five to eighty feet below the surface, it is hard to state just how often subsequent applications of water should be made after the fruit is fairly set and this first new growth well developed. I find that on lands where the surface water comes within fifteen to twenty-five feet, from five to eight applications of water to orange trees has been desirable every season during the past ten years. It is entirely unnecessary to suggest how often vegetables require water. It is safe to leave that to almost any tiller of the soil.

Little need be said here about my last question: What to irrigate. In general, the best paying "money" crops are the ones to irrigate. All citrus fruits—the orange, lemon, pomelo—in all their varieties, are kept in rapid and continuous growth, are quickened to fruitfulness and greater perfection of fruit, are made strong to withstand insect and other enemies, by the judicious use of water.

Pineapples are a profitable crop, but except in rare locations it is water that makes them so. Strawberries are a profitable crop with abundant water to make them so. Even on high pine land, strawberries have been made to yield by the use of water (not forgetting the fertilizer), at the rate of one quart of berries for each hill. That means about 20,000 quarts to the acre. Abate one-half of that and there still remains a very profitable crop. Where there is no danger from frost, or where one can protect from frost, the use of water will insure large and profitable crops of potatoes, tomatoes, string beans, cucumbers and celery in the season of the year when prices are highest. The whole round of truck gardening at all seasons of the year is also made vastly more certain and productive by the use of water.

Tobacco is another money crop where water is most useful. It is needed for the vineyards on which so many hopes have been hung. It is a great help—if not a necessity—for the peach orchards, the guavas, the mangoes and the bananas. These all are valuable fruits, but twice valuable when their quantity and surety are guaranteed by the use of irrigation. Many other things might be mentioned, but let this suffice. Every man knows for himself the plants, or trees, or crops he would like to raise if he could. Let me assure him that his lack of water at command is his chief lack. I do not say the only lack—location is much. Soil is a great deal. A compost heap is a great factor, and be careful to select reliable and standard fertilizers and apply with no stinted hand. Frost, at times and in some places, is as fatal as drouth. But water can be had by those who will have it. If a man has not the means to irrigate forty acres, in most places he had much better not try to occupy forty acres. We have been saying for years: Plant no more than you can thoroughly cultivate. We now go another step and say: Plant no more than you can thoroughly cultivate and irrigate. These, pre-eminently, are the two maxims for Florida—thorough cultivation and irrigation, irrigation and thorough cultivation. Put them in the order you please, practice them wisely, choose the right crops and prosperity will surely follow.

Shall I tell you in conclusion of the vision that sometimes rises before my mind's eye? As I ride through our fair state a lovely landscape often comes in view. I stand on a swelling slope, stretching away to a clear lake whose waters reflect the midday sun and shadow the winding shores. The tall pines murmur in the breeze. The sturdier hickories and oaks, in the little valleys which now and then lead toward the lake, are hung with streamers, whether of joy or mourning, who can say? Is it joy for the transformation soon to come, or mourning for the peace and solitude of nature undisturbed?

Even as I look the scene seems to change. The tall pines, for the most part, have vanished or are only left in groups here and there. I see pleasant winding roads, bordered everywhere by thrifty trees. The arrangement seems that of the landscape artist rather than of the land surveyor. The natural beauties of the situation are brought forth and developed. The grades have been considered, and the views and the streets seem to invite further progress, as one discovers something alluring at every turn. I see attractive looking houses here and there, each standing on a lot of sufficient size to have its own pleasure grounds, garden, groves and fields, but not so large as to make neighborly intercourse a burden. Nor are

there long uncultivated distances from one house to another. There is a small church and a school house, a railroad station and a postoffice, a store and the village inn. Conspicuous among the industrial enterprises is a canning factory, every producer bringing hither his surplus fruits and vegetables and having them canned, or the fruit made into marmalade, jellies, jams, fruit juice and wine, and sold for the common good. It seems everywhere a community of homes. If there are none of great cost or elegance, neither are there any showing neglect or poverty. All vegetation is thrifty. The fruit trees are well grown and loaded with fruit. The lawns are green with verdure, and gay with flowers. The gardens are full of growing and ripening vegetables. The fields are rich in promise of good harvest.

The traveler, perhaps even this body of skilled horticulturists, coming suddenly upon this vision of beauty and successful industry, is greatly astonished. The vast stretches of thirsty land on every side are recalled. The ragged little pioneer towns rise up to enforce the doubt. Abandoned houses and groves, and the wrecked hopes of unsuccessful venture, prompt the traveler to say: "Where am I? Is this Florida?"

Yes, this is the real Florida. Thus it is best to have from the first an irrigated settlement. This town of my fancy had its water put in before a lot was sold. Every lot averaging perhaps no more than five acres, and the whole aggregating a mile or more each way, had a water main brought to its boundary. The original cost of the plant was added to the cost of the land, and the purchase of the land carried with it a right to the perpetual delivery of water, a given quantity to each acre, subjected, however, to a perpetual annual charge upon each acre sold, for running expenses and renewal fund. When you remember the very low price of most unimproved land in this state, it will be seen that the cost of an irrigating plant divided among 600 or 1,000 acres, would not make the aggregate cost nearly so high as the speculators often put upon the bare land without water. The annual charge also would be almost nominal.

I have supposed each owner to do the piping on his own premises. It is also necessary to suppose the management of this enterprise, its initiative and maintaining force, to be in a far-seeing and broad minded man or company, who would be content with a reasonable profit, who had sufficient capital, and great tact and good judgment. Such combinations are not so rare as is sometimes supposed. The chief difficulty is in interesting men of the right stamp.

But I must not weary you with pictures or prophecies. I

have indeed only transferred and adapted to Florida a very common sight in California and the far west. Irrigated colonies are there numerous and rapidly increasing. We need them here. They will make our state prosperous. They will fill up the waste places. They will give opportunities for thousands of people to make beautiful homes for themselves and their families. They will lead to other industries beyond what I have so briefly sketched, and help on the prosperity, education and happiness of our whole people. Such is my faith in irrigation. I believe that faith to be founded on facts, sustained by cool reasoning and confirmed by years of careful observation among the conditions here existing.

---

## Marketing Oranges,

---

Verbal report by T. Hind, of Georgetown, chairman of Standing Committee on Marketing.

I have not had the pleasure of meeting either of the other two members of this committee to consult with them. I have written to each gentleman, however, and have received from one of them his views. The season that we have passed through has been the most disastrous one in the history of orange growing. The amount realized from our crop this season (the largest we have ever had) has been the smallest any of us ever dreamed of getting, and I believe there is not one of us here to-night who, had he known that after these years of toil he would receive no more for the product of his labors than he has this year, would have embarked in the business. The year 1893 will be remembered by all engaged in the culture of oranges as a year for phenomenally low prices. The chairman of your Marketing Committee last year, Mr. Bean, stated that over 50 per cent. of the crop of 1892 has been sold in the state and he predicted the experience of last year would bring buyers into the state for the whole crop this year. This prediction was not fulfilled in my section. Buyers have never been so scarce. Admitting that the best plan would be to sell on the tree, experiences this year have demonstrated that

we are partners in this ideal business. The man who will give a fair price for our goods has come this year in large numbers. Furthermore, experience has demonstrated to us that the average grower would rather part with his fruit to a man one thousand miles away than to a man with a certified check in his pocket.

Now, as to the reasons assigned for this year's disasters: One of them is the rushing to market of green fruit. Last September the state was flooded with circulars soliciting consignments of green fruit and stating that they had facilities for coloring it. Having located sixteen years ago north of the frost line I have selected for planting only those varieties of oranges that would mature early and permit of their being marketed by December 15, hence I was interested enough in the scheme advertised to go to New York and see for myself the kind of fruit they received. I sent ahead four shipments of early fruit. Some of the oranges were from seedling trees around my house. On reaching New York I called on the firm and found that two of my shipments had already been sold and also found their salerooms stocked with fruit. They refused to impart their mode of coloring. My fruit three or four days after arrival was shown me well colored. The oranges were not being sold according to their ripeness. My sour seedling fruit netted as much as my early oblongs. The West India fruit is boxed and sold as Florida fruit. I saw with my own eyes barrels of West India fruit being transferred from the barrels into boxes bearing the private marks of some of the gentlemen here to-night. The orange season is lengthened by early shipments; this is of great advantage if it can be done successfully. A peculiar circumstance connected with the shipment of green fruit was this: Comparatively few of them were of our early varieties and very little of the fruit came from Duval, St. Johns and Clay counties; the bulk came from Manatee and Polk counties.

Another reason for low prices is the shipping to irresponsible commission men. Why at this date, after so much discussion, there should be growers who persist in sending their goods to commission merchants who are irresponsible, is inexplicable. As I was going along Bainbridge street one day, I saw a lot of fruit along the ferry and a heavy rain was pouring on the boxes and soaking them through. Whom the commission men blamed when they sent their account sales to the growers I do not know. There are fruit commission merchants who make a specialty of Florida fruits and keep good storage room, but so long as we persist in sending fruit to irresponsible men, low prices will inevitably be the result. During the past season shipping oranges in bulk has grown in

## SEVENTH ANNUAL MEETING OF THE

favor. Not having any experience in shipping in this manner, I am unable to say how the venture turned out, but from the reports of several gentlemen and the conversations I have had with them, I think they have been mainly successful. This mode of shipping, saving as it does, the great expense of boxes, paper, wrapping and picking, is destined to grow in favor with the shippers.

- During the early part of the season, shipments of oranges to England largely increased over other seasons. Mr. Ives, the general manager of the Florida Fruit Exchange, informs me that the shipments sent over during the seasons 1892 and 1893 netted shippers f. o. b. at their stations \$1.42 per box. He also informed me that no statistics have been compiled for this year yet.

It may perhaps be wise to call the attention of the Society to the fact that there is a movement being agitated in New York to control the sale of fruit at auction by permitting none but members of the fruit exchange to bid, thus shutting out dealers and peddlers. This I think would be a serious blow to the auction system of sales.

From the best advice I have and from consultation with numerous people and by correspondence with growers, I feel confident in asserting that the proceeds from our oranges was not above 20 per cent. of what they sold for the previous season. When it takes from 60 to 80 per cent. of any product for marketing it, it does seem to me that a sensible and reasonable man should seriously study the situation. It can have but one end and that universal disaster to the business and distress and poverty to the growers. The enormous amount charged for the carriage of our fruit to market is far beyond what is charged for any other commodity grown upon the soil. The statistics as furnished to the Inter-State Commerce Commission by the managers of the different railroads of this country, show that the average cost of moving a ton of freight is something under six mills per mile. Now, if each one of you will take and figure for yourself the amount of freight charged you to the basing point, be it Jacksonville, Gainesville or Callahan, estimating twenty-five boxes to the ton, you will see that you are paying from 100 per cent. to 1,000 per cent. beyond the actual cost of carriage. That is not the worst feature. We all know that water transportation is far cheaper than railroad transportation, but if you allow to the coastwise steamers engaged in this trade the same rate per mile that it costs the railroad companies to carry a ton of freight, you will find that they are exacting from you over and above the cost of carriage 25 per cent. to 50 per cent.

We are confronted by this condition, that owing to the close business arrangement of the different companies and the coast-wise steamers we can expect no relief except it is unanimous. As I understand it, they are bound under a very heavy penalty not to decrease the rate. It does seem to me as chairman of this committee that it would be wise on the part of this Association to take every measure of relief that is at hand, no matter where it comes from. We cannot afford to wait; we cannot afford to let any sentiment stand in the way. It is business, pure and simple.

---

## Transportation.

---

No paper or written report presented on this topic. A synopsis of the discussion is given below.

Major G. P. Healy, Putnam county, Chairman of the Standing Committee on Transportation, made a verbal report, recounting the details of the arrangements made for the transportation of members to and from the meeting. He did not think it the province of the committee to go into the general subject of the transportation of our products to markets. As a purely commercial question it had no place in the proceedings of the society. Now that it had become more or less a political question, it was still less an appropriate question for discussion. It was wholly foreign to the purpose for which the society had been organized and carried on. It was in violation of its constitution and by-laws. Whenever introduced it was the cause of useless contention and acrimonious debate.

He fully realized the importance of the transportation question; it was a business matter of vital importance to every fruit grower. He did not underrate the necessity of securing an immediate remedy of existing evils in this direction. In view of the prevailing low prices of our products in market, the present rates of freight were partially prohibitive; the very existence of our industry depended upon speedy relief. But he deplored the effort being made to use this society as a means of agitating the question. If, by sacrificing the society, some practical benefits in the matter of transportation

could be obtained, he might be willing to sacrifice the society. But it was manifestly impossible to accomplish anything in this direction through the society. The attempt could only result in lowering the tone and standing of the society, if indeed, it did not bring about actual disruption. He was in favor of an organization for the specific purpose of dealing with this question, and it was a matter of sufficient magnitude to occupy its entire attention. Such an organization would have his hearty sympathy and support, and he believed that, if organized upon a business basis, as it should be to deal with a business question, it could not fail of accomplishing the desired object. But this was a scientific society, and he must protest against this subject being brought before it.

Mr. E. B. Carlton, of Arcadia, DeSoto county, said that he could not agree with the gentleman preceding him. He believed the work of this meeting would be in vain if the members went home without acting upon this particular question. He was not only a grower but also a shipper. He had lost money on nearly all his shipments the past season, and the railroad people had the benefit of them. He had put money and time into the business for the benefit of the commission merchants and the railroads. If it must continue in this way, he thought the average growers had better give up the business. Five years ago we shipped 100,000 boxes of oranges which sold for high prices. To-day our crop amounted to 5,000,000 boxes and the prices were low. Yet we were paying the same lines the same rates for transporting our product. Prices were still going down, we were losing money, and the question is what we were going to do about it. What were we going to do with the fruit produced? and what was the use of producing fruit unless we get a paying price for the product?

Mr. Carlton cited instance after instance in which he had shipped cars of fruit which sold for fairly good prices, but which, after deducting the transportation and commission charges, left him behind the cost of production.

He said that California, with but 2,000,000 boxes, had secured a favorable rate to the northern markets; a better rate to the same markets than we have with 5,000,000 boxes, although we are a thousand miles nearer. California had secured this by organization; we could secure corresponding benefits simply by organizing. We raised better fruit than they did, but we fell behind them when it came to marketing it. He knew no other product that was marketed with as little business sense as the Florida orange. It was a useless waste to put labor, experience and capital into the orange business, and to come here for a week at a time to learn to grow this

fruit all for the benefit of the railroad corporations and the commission men.

He believed there was a remedy; that it lay in organization; that if the matter was properly taken up the railroads would meet the growers half way. He did not believe, as had been suggested by some, that it was necessary to go to Atlanta and appear before the Tariff Association. Only a day before he had been assured by a railroad official whose attention he called to these rates, that he would take pleasure in meeting such an association for the purpose of devising a more equitable rate. The members of the society did not seem willing to invite the railroad representatives to discuss these matters with them. What then could be done. Will the rates better themselves? The railroad's interests and the fruit grower's interest are mutual. They should go hand in hand. If the fruit growers of the state are successful, the railroads will be successful also, and they are not going to make a rate and maintain that rate if it will retard the progress of their traffic. The facts must be put before them. They must be made to understand them. If we organized, we could do as much as California. If the society did not take the matter in hand, in his opinion, this neglect of duty would be a matter of regret later on.

Mr. Healy, Chairman of the Transportation Committee, said no grower was more willing than he to take a part in an association for the purpose of ascertaining and applying a remedy for these transportation evils. But "you might just as well apply for a remedy in your transportation matters, to the king of the cannibal islands, as to ask the general freight agents of the State of Florida to meet you here. It would be a wretched farce. They have nothing to do with the making of freight rates. If you go to Atlanta and invite the Southern Freight Association to meet you here, and convince them that the rates are wrong (your committee is satisfied that the rates are wrong), or if you appoint a committee to go before these people and make their demands, I have no doubt but that they would be entertained, and I believe that is one way to remedy the rate; and I believe that something might be accomplished, but these people here in Florida are not in it a little bit. They make a rate, and the great big Pennsylvania railroad dots an "i" and they are smashed out of existence. They are nowhere. They do not know anything about it. Now, the orange grower can remedy his rates, and these men that get up and make a great howl about the rate and then put their hands in their pockets and contribute 10 per cent. of their earnings to transport their product, can have all they have got to New York, Philadelphia, Boston or Baltimore,

London or Chicago, for 50 or 75 per cent. cheaper than they do now. Will they do it? Not a man. If you opened a subscription of stock to be paid in cash that would open a line on a highway on which nobody has the right of way, and on which everybody has the right of way, be your own transportation companies, and ship to New York, England and the east for twenty-five cents, how many would you get to subscribe, and how much money would you raise? and how many would pay if they agreed to? I have been at the birth and death of a dozen Florida orange growers' unions, and I rejoiced when they were born, and went into sackcloth and ashes when they died. Mr. President, your Chairman of Committee on Transportation hopes, of all things, that this society will not be brought into the disrepute of doing anything that can have no possible good ending."

Mr. Thomas Hind was in favor of any movement looking to the reduction of freight rates. He thought it unjust that the men to whom millions of acres of the best lands in Florida had been given as a bonus against possible loss in operating railroads in this new country, should refuse to reduce a rate so palpably unjust. The rates were fixed by the Southern Traffic Association. He did not know how much influence the various roads included had with this Association. He would not stop with subordinates, but would carry the matter to the two or three men who controlled this Association. It was a nice state of affairs that we should come here and take up day after day in discussing the best modes of raising the finest fruit ever plucked, and go on making investments and spending years of toil simply to increase the wealth of the railroads which leave us but a third of what our product should yield us. It might not be possible to organize, there had been failures in that direction, but it was certain we could never succeed if we did not try. The only way to bring the roads to terms was to insist that the rates be reduced, and the only way to insist effectively was through organization.

It had been suggested that we build ships of our own to carry our fruit. This should not be necessary. If it were not for our national shipping laws preventing ships carrying foreign flags engaging in coastwise commerce, we could charter all the vessels we needed. He was in favor of the repeal of these laws. The mere fact of their repeal would destroy the monopoly controlling coastwise traffic and would bring down the rates without the chartering of a single ship. Such a bill was now before congress and he urged upon the Society the passage of a solution favoring this bill.

Mr. J. D. Crews thought it was time to start the ball rolling, that it should not be allowed to stop until relief was obtained

and until the rates, which under present conditions amounted to extortion, should be brought within reasonable limits. He went at length into the question of rates, citing numerous instances in support of his position.

Mr. John Darby said he had listened to the remarks of the gentlemen, that there was no doubt we had the disease, but he had heard no good remedy. Mr. Healy had made a remark about going to Atlanta. As he (Mr. Darby) understood the transportation business, all these roads entering the state of Florida have entered into a combination or an Association for the purpose of protecting their own rates and in doing so they have entered into an agreement that if one road cuts the rates that road is subject to a fine for each offense. That Association is in Atlanta or has its headquarters there, and a request for lower rates forwarded to a general freight agent in the state of Florida would enable that agent to give a concession on rates to the state line, but he would be powerless to give you rates outside of his state. He had made some very careful inquiries into the question of rates and their abuse; the transportation companies were as much interested as we were; for this reason, if they impoverish the orange industry they will certainly reduce the amount of freight they get. The rate on oranges from Jacksonville to Chicago is 60 cents per box of eighty pounds, in carload lots only; on apples from Chicago to Florida the rate is 40 cents per 100 pounds. On fresh meats, which is a perishable freight, the rate is 43 cents from Chicago to Florida. On 100 pounds of meat the railroad companies assume a liability of \$16. On eighty pounds of oranges they assume a liability of \$1. There was injustice there. From Jacksonville to the Ohio river, 863 miles, the proportion is 46 cents; north of the Ohio river, a distance of 300 miles to Chicago, it is 14 cents. The average price on oranges in the state of Florida on an average haul of 200 miles is 18 cents. Now, we have not only to contend with the railroads in Florida, but we have to contend with their connections. He was not putting in a defence of railroads and he would like very much to advocate the popular side, but the railroad companies were in this position in this state. They could not ask the railroads outside of this state to reduce their proportion, for when they did, the outside railroads would say, "why do you not reduce yours?" and if they did reduce, the probabilities are the reduction would be covered by an increase by some of the intermediate lines. So he thought Mr. Healy very nearly right in his suggestion that we go before the commissioner in Atlanta. The orange industry has got into a position where the transportation companies realized that it was impossible for it to go on much longer without conces-

sions in rates, and furthermore, a concession in rates would enable the orange growers to produce that much more fruit. The matter should be taken up in the best manner. We should pursue a course of policy before endeavoring to antagonize and see if we could not get a concession in that way. He would go into a company formed for the purpose of building a transportation line. He would contribute his mite and would take all interest in the project, but could it be made a success? Could it be done? And if we failed after antagonizing the railroads, we would be powerless. What we wanted was a lower transportation rate on the next crop of oranges and to get direct benefit instead of indirect benefit. He would favor as a resolution that this Society appoint a committee of two or more with the request that the board of trade of Jacksonville appoint a similar committee and also the Orange Growers' Association to be formed, to wait on this Traffic Association in Atlanta, present the facts before them and see if we could not get a concession. The railroads outside the state of Florida participate in the benefits of our crop to the extent of millions of dollars a year and they make that in two months. As a result of the last orange crop the grower was unable to pay for the fertilizers he needed, in the absence of fertilizer there would be a short crop and unless they aid us they will destroy an industry out of which they get millions of dollars.

Mr. Hind said that all the transportation companies interested in carrying fruit from Florida had formed an organization, a "combine;" in other words, they had formed exactly what we ought to try and form. They were in a certain business; they got together to adjust their affairs and we should do the same thing.

Mr. Healy wanted to know if we could get these rates by fighting. This fight had been going on for years, but he had not seen any better rates yet. If anyone had a formula or plan for getting rid of the trouble, he would be glad to hear it.

Mr. W. H. Mann wanted to know what all this amounted to. The railroads were not to blame; if we were fools enough to pay their tariff, let them have it. Why did we not go to work ourselves and organize and send a committee to the railroads and say that if the rates were not adjusted we would go to other lines.

S. S. HARVEY—I have lived in California. There they organize and are not afraid to put their hands into their pockets to do it. The only remedy was to organize, and if it was necessary to build a steamer to carry your fruit, to build it.

No talk was going to do any good. He had been fighting railroads for twenty years. Until we could keep together and go to the railroads with a firm demand, we could get nothing from them. Until we organized it was no use to keep talking. We must put our shoulders to the wheel.

O. P. Rooks thought this was a subject in which we were very much interested, and as we had with us two gentlemen who had given a great deal of practical thought to the question, these problems having been before them and they having prepared a paper that they hoped to be able to present to the Society and, as some plan had been asked for, he hoped to hear their paper read.

C. F. A. Bielby disliked to antagonize Mr. Rooks, but was it right and proper for gentlemen who had some scheme or other on hand to come before the State Horticultural Society asking to lay before this Society that scheme? He thought this outside our province. If we allow one gentleman or two gentlemen to come in here and read us a paper which they have prepared on the organization of the state and upon the methods they think good, and make a Jubilee day come for him or them, we were bound to throw ourselves open to everything else and heretofore we had guarded this Society against being made a place for the originators of transportation ideas to come and orate upon their plans and spread them, through us, to the world. We were purely a scientific body and he believed the judgment of nine-tenths of all the old members of the Society to be against such a course. He protested against it. "When we admit the reading of such papers before the Society, the day of its dissolution begins. I believe it to be right and reasonable that we should calmly discuss every situation which makes progress towards our elevation and success. If any man has a plan fully perfected which has been published broadcast to the world and he comes here and properly discusses it, I do not object to it, but this is not the proper place to boom new ideas. I do not believe it is right for us to appoint committees to go to Atlanta and meet committees on transportation matters. I do not believe we have any right to petition congress for a tariff to be put on or taken off anything. The purpose of our meetings is to interchange ideas that we have formed during the work of the year and everything that could be said for our mutual benefit and interest in the raising of fruit. If it is to be a question of one phase and the other phase of agitation, then I say that the Society will appear to the world as a political body and will be taking a step towards its disruption.

Mr. Lyman Phelps protested against this matter coming before the society.

Mr. Rooks thought it a proper subject for the society's consideration. He also thought it perfectly right and proper for the society to petition congress for the passage of the bill referred to, which would solve the problem of water transportation, and he introduced a resolution having this object.

Mr. Bielby was aware that some members were agreed as to the good policy of the passage of this bill, and he suggested that they form an organization while here, for the purpose of petitioning for its passage. But he objected to having political subjects coming before the society and becoming part of its minutes. He did not object to a petition of this character being made by an organized body and authorized party. He did not object to their asking our representatives to work for such a bill. But it was by no means the unanimous wish that the society take such action; it was a political matter, and he objected to this society being captured to be used for political purposes.

Mr. Hind asked why, if railroad matters should not be mentioned here, the society had a Standing Committee on Transportation.

Mr. Bielby replied that we had a Committee on Transportation for the purpose upon which the chairman had made his report. There was also a wide range of subjects that properly came within the scope of such a committee without touching the question of rates. In view of the lines upon which this question of rates was being agitated, it approached very closely to politics and led almost unavoidably to political discussion, as was patent to all after what had been said. And, aside from this, it was purely a business matter, and as such, had no place in our discussions. It was a very proper subject for the action of an association organized for such purposes, but was out of place in a scientific body like this society. He did not so much object to the calm discussion of the transportation question, but when it was proposed to petition congress to do something purely political, he did object, and insisted that the resolution was out of order.

After considerable further discussion of the subject, Mr. C. A. Bacon said: What we want is individual action. We have heard the remarks of Mr. Healy, that it is of no use to go to the transportation companies here in the state; he is not positive that it would be of any use to go to Atlanta. We have heard the report of the gentlemen of their receipts obtained for oranges; we have all had such receipts for our oranges, and I must say that several times this season I have been

ashamed of myself, that I should work twelve months, pack my oranges as nicely as I could, box them, ship them to New York, and have returns come back that yielded not enough to pay my hired help. I would like to ask a question as to a matter I am not thoroughly posted on. I simply wish to put the question; the members might say yes or no, to save time. Do they really believe there has been money enough received back from the north to pay for all the expenses of the crop of oranges this year?

Cries of No! No!

Now gentlemen, as to this question of transportation: It has been clearly shown here that there is no use to resolve and resolute on the question. Resolutions do not amount to a row of pins; applications to railroad companies do not amount to a row of pins. Now, how are you going to bring the transportation companies to terms? We have been working along the lines suggested for years. We have not made one step in advance. If our returns have been insufficient to pay us for raising the last crop, and this seems clear, what is the use of shipping the next crop? Let us stop right here and go into no more expenses for the next year's crop, and if we do this, will not the railroads come to us and ask us to ship our oranges, and will they not give us a rate at which we can afford to ship?

---

### Place of Next Meeting--Jacksonville Selected.

---

G. H. WRIGHT, of Chuluota—I move the place of next meeting be taken up.

Carried.

The PRESIDENT—The question of location of next meeting is before the society. Have any communications been received upon the subject?

The SECRETARY—The following has been received. (Reads.)

ROOMS OF THE BOARD OF TRADE,  
JACKSONVILLE, Florida, April 11, 1894.

*Dudley W. Adams, President Florida State Horticultural Society.*

DEAR SIR: The Jacksonville Board of Trade extends a cordial invitation to your organization to hold its next annual meeting in this city, and profers the use of its rooms for its sessions. Respectfully,

CHAS. H. SMITH, Secretary.

A MEMBER—I move that the invitation be accepted.

The PRESIDENT—The subject before the society is determining the location of next meeting. You have heard the invitation from the Jacksonville Board of Trade. It is moved that the invitation be accepted.

A. G. AVERY (of Orlando)—I suggest as an amendment that we meet in Orlanno next year.

A MEMBER—I think we should accept the invitation of the Jacksonville Board of Trade for the reason that there are hotel accommodations in Jacksonville for all who may want to come. The hotels of Orlando will not comfortably accommodate this body at this season of the year.

W. A. COOPER (of Orlando)—We can accommodate at Orlando three times as many as are in attendance here. I think that it is due to that portion of the state that the meeting be held there. We will take good care of you. I hope the society will decide to convene next year at Orlando.

S. S. HARVEY (of Molino, Escambia county,)—I trust this motion to amend will not prevail. I hope we have about settled down in Jacksonville [applause]. I have this hope because I am in the extreme western part of the state. I am nearly 400 miles west of this place, yet I can get here in a day. It would take me two days to reach Orlando. It will be very difficult for the people of West Florida to retain their active interest in this society if they must make a two or three day's journey into southeastern Florida to reach its meetings. It seems to me it is advisable to stay in the center where all can reach the meetings. I have attended meetings of this society and like conventions all over the state of Florida, and I never had any comfort in attending assemblies of this kind in any small town. The large hotels in the small places are closed at the season when our meetings are held. Some like to go to the large hotels, others do not; in a city of this size all can be accommodated. The city does not feel a crowd. Here in Jack-

sonville you meet all the business men in the state with whom you have dealings. It is more easy of access than any other place in Florida. The next meeting should be held in Jacksonville.

Mr. AVERY—I think the gentleman is slightly mistaken in regard to Orlando's ability to take good care of the society. I feel that we have a claim upon you for Orlando. If it is not advisable to hold the next meeting there, and we hope it will be advisable to do so, then we shall expect you at some future time.

A. H. CARY (of Orlando)—I wish to state one thing in reference to Orlando: We have any amount of accommodations there, and we can increase our capacity if necessary. But there may be other reasons why Jacksonville would be the best meeting place.

The PRESIDENT—The question is on the amendment substituting Orlando for Jacksonville.

Amendment lost.

The motion is to meet in Jacksonville next year in response to the invitation of the Board of Trade.

Carried.

The next meeting will be held in Jacksonville.

---

### Resolutions of Thanks:

---

*Whereas*, The Hon. L. B. Wombwell generously came to the aid of this society and printed and published the Journal of the last session without charge, issuing it first in bulletin, and afterward in book form, thus insuring for it a wide circulation, thererore,

*Be it resolved*, That the cordial thanks of this society are tendered Mr. Wombwell, and an assurance of deep appreciation of his graceful act of assistance. And,

*Be it further resolved*, That the secretary of this society be

instructed to send a copy of this preamble and resolution to Mr. Wombwell.

*Be it resolved,* That the thanks of this association are due, and are hereby tendered to the Board of Trade of the city of Jacksonville for the use of their rooms, and for the many courtesies extended. And that the secretary is instructed to make this expression by an appropriate letter.

*Be it resolved,* That the general passenger agents of the railroads of Florida have extended to them through the secretary, an expression of appreciation and thanks for the low rate charged the members of the society in attendance at this meeting.











New York Botanical Garden Library



3 5185 00269 0855

