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1905

REPORT

OF THE

State Horticultural Association

OF

PENNSYLVANIA

FOR 1905

WM. STANLEY RAY,
STATE PRINTER OF PENNSYLVANIA.
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CONSTITUTION AND BY-LAWS OF THE STATE HORTICULTURAL ASSOCIATION OF PENNSYLVANIA.

Article 1. This society shall be entitled "The State Horticultural Association of Pennsylvania," and its object shall be the advancement of the science of horticulture and pomology.

Article 2. Any person may become a member of this society by a vote of a majority of the members present at any meeting, and by paying into the treasury the sum of one dollar annually; or the payment of one dollar to the treasurer, at any time, shall constitute membership, and entitle said member to a copy of the proceedings, The payment of ten dollars at one time will constitute life membership.

Article 3. Its officers shall consist of a president, three vice presidents, recording and corresponding secretary and a treasurer, all of whom shall be elected annually by ballot.

Article 4. The following committees shall be appointed: A committee of five on nomenclature; a committee of three on insects, of whom the professor of entomology shall be chairman; an executive committee consisting of the elective officers of this association and three of whom, including the president, shall constitute a quorum; and a general fruit committee, consisting of one from each county represented, with a general chairman of the whole, each member of the fruit committee to have the privilege of appointing two assistants.

Article 5. The society may, at any time, elect honorary members.

Article 6. The society may, from time to time, appoint professors on entomology, botany, horticultural chemistry and geology.

Article 7. This constitution may be altered or amended by a vote of two-thirds of the members present at any regular meeting, notice of the proposed amendment, in writing, having been previously given.

Article 8. Seven members shall constitute a quorum for the transaction of business.

BY-LAWS.

Article 1. The committee on nomenclature shall collate and decide the standard and synonymous names of all fruit known in the society with the authorities for each, and report, so far as practicable, at each regular meeting, and record the same in a book kept for that purpose.

Article 2. The general fruit committee shall carefully and thoroughly investigate the subject of fruit culture in general. Each local committee of three shall collect such useful and interesting information in relation to the subject as may be in their power, and

embody the same in monthly reports, to be made to the general chairman; such reports to be by him examined and embodied in his annual and semi-annual reports. Also that the said county committee shall form ad interim committees for their respective counties, and further that said ad interim committees are hereby authorized to publish the reports in the "Gardener's Monthly," or such other paper, as they may select, the same having been first submitted to the chairman of the general fruit committee for his approval: Provided, That said publication shall be free of expense to the association.

Article 3. The annual meeting of the association shall be held on Tuesday before the third Wednesday of January of each year, at such a place as the executive committee may appoint, at which time the election for officers shall take place; said officers to serve from the close of the meeting at which they are elected to the close of the succeeding annual meeting, at which an exhibition and discussion of fruits shall take place and other business transacted in the following order:

- 1st. Reading of minutes of previous meeting.
- 2d. Roll call and dues collected.
- 3d. Election of officers.
- 4th. Reports of officers.
- 5th. Reports of standing committees.
- 6th Reports of special committees.
- 7th Unfinished business of former meeting.
- 8th. New business.

The nomination and election of new members shall be in order at any time during the session.

Article 4. Other meetings may be conveyed by the executive committee at such time and place as they may appoint.

Article 5. No member who is in arrears for dues shall be eligible for any office, or serve on any standing committee; and any member who shall neglect to pay his dues shall cease to enjoy the privileges of membership.

STATE HORTICULTURAL ASSOCIATION OF PENNSYLVANIA.

OFFICERS FOR 1905.

PRESIDENT.

Gabriel Hiester,Harrisburg.

VICE PRESIDENTS.

Hon. W. T. Creasy,Catawissa.
Thos. B. Meehan,Germantown.
Dr. J. H. Funk,Boyertown.

RECORDING SECRETARY.

Enos B. Engle,Waynesboro.

CORRESPONDING SECRETARY.

Wm. P. Brinton,Christiana.

TREASURER.

Edwin W. Thomas,King of Prussia.

MEMBERSHIP.

LIFE MEMBERS.

Bartram, J. Hibberd, Milltown, Chester Co.
Boyer, John F., Mt. Pleasant Mills, Snyder Co.
Brinton, Wm. P., Christiana, Lancaster Co.
Chase, Howard A., Perry Building, 16th and Chestnut Sts, Philadelphia.
Chase, Charles T., Perry Building, 16th and Chestnut Sts., Philadelphia.
Calder, Dr. James, Harrisburg, Dauphin Co. (deceased).
Cornellus, Robert, Philadelphia (deceased).
Creasy, Hon. W. T., Catawissa, Columbia Co.
Engle, Henry M., Marietta, Lancaster Co. (deceased).
Engle, John G., Marietta, Lancaster Co.
Engle, Enos B., Waynesboro, Franklin Co.
Ermentrout, Hon. Jas. N., Reading, Berks Co.
Fox, Cyrus T., Reading, Berks Co.
Garrettson, Joel V., Floradale, Adams Co.
Good, C. W., Waynesboro, Franklin Co.
Hacker, William, Philadelphia (deceased).
Hartman, D. L., Etters.
Hayes, Charles P., Philadelphia.
Heyser, Jacob, Chambersburg, Franklin Co. (deceased).
Hildrup, W. T., Raleigh, N. C.
Hiller, Casper, Conestoga, Lancaster Co. (deceased).
Hiller, Peter C., Conestoga, Lancaster Co. (deceased).
Hoopes, Josiah, West Chester, Chester Co. (deceased).
Huff, L. B., Greensburg.
Huff, Burrell R., Greensburg.

Landis, Israel, Lancaster, Lancaster Co.
 McCormick, Harry, Harrisburg, Dauphin Co. (deceased).
 McCormick, James, Harrisburg, Dauphin Co.
 Martin, J. O., Mercersburg, Franklin Co.
 Meehan, S. Mendelson, Germantown, Philadelphia Co.
 Pannebaker, Wm. M., Virgilina, Va.
 Reist, Peter S., Lititz, Lancaster Co. (deceased).
 Reist, John G., Mt. Joy, Lancaster Co.
 Scribner, Prof. F. Lamson, Knoxville, Tenn.
 Shaffner, Jacob, Harrisburg, Dauphin Co.
 Swift, Rev. E. P., Mt. Oliver, Allegheny Co. (deceased).
 Thomas, George B., West Chester, Chester Co.
 Thomas, Edwin W., King-of-Prussia, Montgomery Co.
 Van Deman, H. E., 3630 13th St., N. W., Washington, D. C.
 Wertz, D. Maurice, Quincy, Franklin Co.

HONORARY MEMBERS.

Barry, P., Rochester, N. Y.
 Downing, Charles, Newburgh, N. Y. (deceased).
 Eliwanger, George, Rochester, N. Y.
 Edge, Thomas J., Harrisburg, Pa.
 Garber, J. B., Columbia, Pa. (deceased).
 Heiges, Prof. S. B., Saxe, Va.
 Meehan, Thomas, Germantown, Pa. (deceased).
 Michener, Dr. E., Toughkenamon, Pa. (deceased).
 Parsons, Prof. S. B., Flushing, N. Y.
 Parry, William, Parry, N. J. (deceased).
 Rathvon, Prof. S. S., Lancaster, Pa. (deceased).
 Rowe, Hon. D. Watson, Chambersburg, Pa.
 Rutter, John, West Chester, Pa. (deceased).
 Saunders, Wm., Washington, D. C. (deceased).
 Stitzel, George D., Reading, Pa.
 Thomas, John J., Union Springs, N. Y. (deceased).
 Warder, Dr. John A., North Bend, O. (deceased).
 Wilder, Marshall P., Boston, Mass. (deceased).
 Wickersham, Dr. J. P., Lancaster, Pa. (deceased).
 Willetts, Rev. Dr., Philadelphia, Pa. (deceased).

ANNUAL MEMBERS.

Allison, J. W., Mercer.	Groff, Dr. Geo. G., Lewisburg.
Armsby, Dr. H. P., State College.	Haines, Mary M., Cheltenham.
Barnard, C. P., Northbrook.	Harnish, H. H., Hubers.
Baxter, C. W., Haddonfield, N. J.	Harper, Wm. Warner, Chestnut Hill.
Bishop, W. O., 1302 William St., Harrisburg.	Harris, Phillip, Light Street.
Bolton, W. P., Bonview.	Herr, Daniel D., Lancaster.
Boyer, F. D., New Cumberland.	Herr, David S., Mountville.
Bridges, George, Carlisle.	Hess, Enos H., Lancaster.
Bracken, J. W., Hollidaysburg.	Hiester, Gabriel, Harrisburg.
Breisch, D. D., Ringtown.	Huston, Chas. L., Coatesville.
Breisch, Robt., Ringtown.	Johnson, W. B. K., Allentown.
Bucher, Dr. I. Riley, Lebanon.	Hill, Dr. S. S., Minersville.
Butler, Allen, Ogontz.	Jones, S. Morris, West Grove.
Butz, Prof. Geo. C., State College.	Keath, Dr. J. W., Shaefferstown.
Christman, James M., Fort Hunter.	Keller, Walter J., Pottsville.
Cooper, Calvin, Bird in Hand.	Kloss, D. S., Tyrone.
Cotter, Lawrence, Danville.	Koons, Dr. P. R., Mechanicsburg.
Coursen, I. H., Carverton.	Kready, John, Mount Joy.
Critchfield, Hon. N. B., Harrisburg.	Kraybill, S. S., Mount Joy.
Denlinger, Amos B., Iva.	Krewson & Son, Jas., Cheltenham.
Demming, H. C., Harrisburg.	Laub, H. H., Jr., Lewistown.
Eastabrook, F. L., Athens.	Leyder, J. S., 319 Peffer St., Harrisburg.
Eby, Amos F., Mount Joy.	Longsdorf, C. L., Floradale.
Engle, Ezra B., Marletta.	Loop, A. I., North East.
Erb, Amos H., Lititz.	McGowan, H. G., Geiger's Mills.
Eslinger, Samuel L., Good Hope.	McLanahan, J. King, Hollidaysburg.
Frankenfield, Miss W. S., 223 S 7th St., Easton.	McSparran, W. F., Furniss.
Foster, T. C., Harrisburg.	Marshall, Mrs. J. L., 239 4th Ave., Pittsburg.
Funk, Dr. J. H., Boyertown.	Mayer, H. M., Rohrerstown.
Gilbert, David, Sr., Coatesville.	Mayer, Dr. I. H., Willow Street.
Good, Martin R., Narvon.	Meehan, Thos. B., Germantown.
Graybill, Hon. D. W., East Petersburg.	Miller, John D., Newton Hamilton.

Maffat, Miss M. A., 264 S. Franklin street, Wilkes-Barre.	Sharpless, John D., London Grove.
Moon, Wm. H., Morrisville.	Shepherd, J. W., Scranton.
Mosser, H., Myerstown.	Sierer, Dr. A. L., Harrisburg.
Newcomer, W. S., Glenrock.	Snavelly, H. C., Lebanon.
Nissley, P. R., Mount Joy.	Snavelly, H. H., Lancaster.
Patterson, Jas. G., Stewartstown.	Snavelly, J. R., Harrisburg.
Peters, Earl, Mt. Holly Springs.	Stein, Geo. E., East Prospect.
Persing, E. E., Sunbury.	Stoney, R. J., Jr., 424 5th Ave., Pittsburg.
Purvis, Timothy, Hunsecker.	Stout, W. H., Pinegrove.
Pyle, J. W., Kennett Square.	Stover, F. S., Bowmansville.
Rakestraw, Thomas, Kennett Square.	Surface, Prof. H. A., Harrisburg.
Reichert, J. H. Host.	Sweatnam, Mrs. Jennie W., Mast Hope.
Richards, A. C., New Paris.	Traver, F. E., Wyebrook.
Rife, Jacob L., West Fairview.	Wagner, Geo. A., Alinda.
Root, A. W., Manheim.	Watts, Prof. R. L., Scalp Level.
Root, J. W., Manheim.	Weast, Geo. B., Harrisburg.
Rupp, D. C., Shiremanstown.	Weise, H. B., Parkesburg.
Rush, John G., West Willow.	Wilbur, Harry, Bethlehem.
Schaeffer, Dr. N. C., Lancaster.	Williamson, E. C., Morrisville.
Schock, Oliver D., Hamburg.	Yeager, A. H., Lancaster.
Scholl, Calvin P., Fishersville.	Zigler, Amos, Rowenna.

REPORT
OF THE
FORTY-SIXTH ANNUAL MEETING
OF THE
STATE HORTICULTURAL ASSOCIATION

OF
PENNSYLVANIA

Held at Harrisburg, Pa., January 17-18, 1905

The attendance throughout was good and much interest manifested in the papers and discussions. There was a large display of apples, although some of the specimens were inferior in quality and appearance.

The following new members were enrolled during the sessions and since last annual meeting:

LIFE MEMBERS.

D. L. Hartman, Etters.
Huff, L. B., Greensburg.
Huff, Burrell R., Greensburg.

ANNUAL MEMBERS.

I. H. Coursen, Carverton.	Walter J. Keller, Pottsville.
Mrs. Jennie W. Sweatman, Mast Hope.	Dr. A. L. Sieler, Harrisburg.
John D. Miller, Newton Hamilton.	Jas. G. Patterson, Stewartstown.
H. B. Weise, Parkesburg.	Dr. J. W. Keath, Shaefferstown.
W. O. Bishop, Harrisburg.	C. W. Baxter, Haddonfield, N. J.
J. H. Reichert, Host.	F. D. Boyer, New Cumberland.
Mrs. M. A. Moffat, Wilkes-Barre.	H. Mosser, Myerstown.
Dr. S. S. Hill, Wernersville.	Dr. Geo. G. Groff, Lewisburg.
Lawrence Cotter, Danville.	J. S. Leyder, Harrisburg.
R. J. Stoney, Jr., Pittsburg.	John D. Sharpless, Londongrove.
Harry Wilbur, Bethlehem.	J. W. Shepherd, Scranton.
Chas. L. Huston, Coatesville.	H. H. Laub, Jr., Lewistown.
David Gilbert, Sr., Coatesville.	Jas. M. Christman, Fort Hunter.
F. L. Eastabrook, Athens.	George Bridges, Carlisle.
Mrs. W. S. Frankenfield, Easton.	Geo. B. Weast, Harrisburg.

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The meeting was called to order at the appointed time by the President, and after reading and approval of minutes of previous meeting, and the usual recess of five minutes for payment of dues, the credentials of A. N. Brown, Wyoming, Del., as a delegate from the Peninsula Horticultural Society of Delaware, and E. S. Black, Hightstown, and Wm. H. Reid, Tennent, N. J., as delegates from the New Jersey State Horticultural Society, were presented and accepted, and they were accorded the privileges of the floor.

The following committees were announced by the chair:

Nominations.—Calvin Cooper, Prof. Geo. C. Butz, John G. Engle.

Auditing Committee.—D. M. Wertz, D. D. Herr, Jacob L. Rife.

Nomenclature and Exhibits.—J. Hibberd Bartram, J. W. Pyle, John G. Reist.

REPORT OF GENERAL FRUIT COMMITTEE FOR 1904.

A careful study of the reports of correspondents reveals the fact that nearly every line of horticulture is making decided advancement in this great State. Much encouragement is to be found in the 1904 reports. Very few write in a pessimistic tone, although all have had difficulties to overcome. But the obstacles which at times seem to be almost unsurmountable are no greater than the barriers encountered in sister states. We believe Pennsylvania gardeners and fruit growers have as much grit, wisdom and determination as horticulturists in neighboring states, and the battles to be fought here are no greater—Victory requiring hard fighting anywhere and everywhere.

We repeat that there is much encouragement in the 1904 reports. They indicate progress. Disputed questions are being settled slowly but surely. Information is more positive and more definite. We know better what to plant, how to plant, and how to care for our plantations.

APPLES.

The 1904 apple crop in Pennsylvania was much larger than last year, and probably above the average. Only seven correspondents report a light yield; eleven a medium crop; twenty a good crop, and quite a number in reporting the yield used such terms as "enormous," "the largest," "very large," and "extremely large." The quality in most counties has been good or excellent, some reporting the best. The main complaint has been small sized fruit on account of overbearing, and protracted drouth in some sections. Twenty-five correspondents state that their apples are keeping well. About half this number report that their fruit is keeping fairly well and a few express disappointment as to keeping qualities.

The answers to the question "Which are the three most profitable apples in your county," are exceedingly interesting. Of the fifty-five growers who answer this question, thirty-five give the Baldwin first place. The vote in favor of this popular old variety is practically unanimous in Baldwin counties—that is where climatic conditions are favorable to this variety. York Imperial is forced

to second place. The eighteen votes in its favor come almost entirely from southeastern counties. Although Baldwin takes first place as a money maker, there are few large commercial orchards of this variety, but the number of such plantations is increasing. It is doubtful whether any of our Baldwin growers can show up profits equal to those of the York Imperial enthusiasts. But a vigorous note of warning runs throughout the 1904 reports regarding the most profitable varieties of apples. The once popular commercial apple, Ben Davis, is voted down so far as cultivation in Pennsylvania is concerned. Only five report it among the three most profitable. On the other hand, apples of good quality are making rapid strides to the front. Smokehouse for instance, receives a slightly larger vote than Ben Davis. People are beginning to buy apples for their quality and not merely for their looks. This general trend should be kept in mind by growers starting new orchards. We should plant trees which will produce quality as well as quantity. It is probably a mistake to plant York Imperial where the Baldwin thrives. And in counties where the Baldwin fails as a commercial apple and where the York Imperial takes first place, it is hoped that some variety will yet be found which possesses all the good points of York Imperial and which far surpasses it in quality. We call particular attention to the varieties grown by Dr. J. H. Funk, of Berks county, who at a former meeting of this society discussed their merits and who writes most favorably concerning their behavior the past season. A small test orchard should form a valuable adjunct to every large commercial orchard. If there is anything better than York Imperial which will make as much money per acre, by all means let's have it.

Northern Spy is voted third place in the list for profit. Varieties mentioned three or more times besides the ones already named, are Rhode Island Greening, Rome Beauty, Smith's Cider, Grimes Golden, King and Summer Rambo.

The matter of storage houses is receiving increased attention. Fruit growers realize as never before the necessity of proper storage facilities. The bulk of the winter apple crop is sold too soon in the fall or early winter to secure the largest profit and the effect of this rush for the market is disastrous to prices. Low prices are inevitable. A more even distribution of the crop during the entire period of consumption would have a most desirable effect in raising prices. But not one grower in ten is prepared to store apples under the proper conditions. Cellars are generally used and very few are at all suitable to keep apples for any considerable period. Undoubtedly the best houses are those in which the temperature is controlled by the use of ice. But this kind of storage is financially impossible with the majority of farmers and even orchardists. The great need on hundreds of farms is a cheap, well and properly built fruit house which will enable the grower to hold his fruit in perfect condition until March, April or May. The chairman of this committee expresses the hope that this matter will receive special attention at our next annual meeting in the way of places and recommendations for such houses as are practicable and within the means of the average grower or farmer to erect. Expensive ice storage frightens the small grower out of the notion of any kind of storage except cellars.

Favorable seasonal and climatic conditions have much to do with success or failure in Pennsylvania, but they are not the most potent factors. Careful attention all along the line usually brings success. On the other hand the grower who neglects tillage, feeding, pruning and spraying cannot look for entire or even fair success. Orchard-ing to-day requires wisdom, industry and persistency.

As to controlling the apple tree borer, the use of the wire and knife are almost universally recommended. Protection by paper or a fine mesh wire screening is practiced by a few. Dr. Funk states that he has not been troubled by borers since he began the use of lime, salt and sulphur. Prof. Geo. C. Butz recommends the use of Thum's sticky preparation. Another grower uses white lead and linseed oil. The protection of birds is recommended by another.

Regarding the extent of apple tree planting, fifteen report a decrease, six no material change and twenty-seven an increase. The new plantations are set mostly by commercial orchardists rather than by farmers.

PEARS.

Concerning the 1904 yield of pears, two correspondents report a total failure; thirteen a light crop; six a good crop and a few state it was large, very large or immense, twenty-eight correspondents report good quality, seven medium and six poor.

The vote on the most profitable varieties stood as follows: Bartlett thirty-four; Kieffer seventeen; Seckle sixteen; Clapp's Favorite ten; Duchesse D'Angouleme seven; Sheldon four. In answer to the question "Have you found pears as profitable as apples," twenty-five replied no; twelve yes, and four that they had found pears more profitable than apples.

Judging from the opinion held by our correspondents the much feared and dreaded pear blight is as prevalent as ever. Twenty correspondents report that the disease is on the decrease while the same number say it is on the increase. It is evidently the worst on low ground and in very rich soils. To avoid or partially avoid blight there seems to be a consensus of opinion that a moderate hardy growth should be encouraged rather than excessive wood growth. A rapid, brashy growth is most susceptible to blight. This being the case, high feeding and thorough tillage in fertile soils endangers the lives of the trees. Mineral fertilizers may be used liberally while nitrogenous compounds, including stable manure must be used cautiously in pear orchards.

PEACHES.

The majority of Pennsylvania peach growers are discouraged. A series of crop failures or partial successes has caused many to condemn the business. The 1904 crop in most orchards was a total failure or entirely too light to make a profit or even pay expenses. Encouraging reports come from favored districts, although only five growers report a large crop and a few more refer to the yield as good or medium. The extremely severe weather of last winter is at the root of the trouble in many sections where the trees were severely injured or even killed to the ground. Fruit buds were winter killed in hundreds of orchards.

The reports on "Yellows" are discouraging. Five report a decrease in the prevalence of the disease while nineteen state that the disease is increasing.

The opinions expressed as to the most profitable varieties of peaches are overwhelmingly in favor of Crawford's Late, mentioned nineteen times and Elberta eighteen. Smock is mentioned by nine correspondents. Champion, Old Mixin, Mountain Rose and Stump are favorites.

The replies to the question "Do you reconsider a peach orchard a profitable investment?" are very interesting. Seventeen report the business profitable. The large vote is really surprising, considering the unfavorable seasonal conditions in many sections of the State during the past few years. Not a few of the affirmative replies, however, are accompanied by "ifs," as if the yellows does not kill the trees; if the trees are not winter killed; if the buds are not destroyed by cold weather or frost. These "ifs" are not controllable. Eighteen correspondents say "no" as to the profits, and a York county grower emphasizes his views by replying "no, no, no." Dr. J. H. Funk is the most enthusiastic so far as profits are concerned, stating that the business is "extremely profitable."

PLUMS.

The 1904 plum crop was a signal success. Quite a number of growers report the crop as enormous, immense and the largest ever known. Ten growers report a very heavy yield; eleven a good crop; only eight a light crop and no total failures are mentioned. The 1904 conditions were generally most favorable. The severe winter weather interfered in a very few places and some complained of much fruit being destroyed by rot.

In the plum orchard as well as on the battle field the "Japs" are winning. The Japanese varieties easily take first place for profit. Twenty-four growers report them the most profitable; seven favor the Domestic or European and five the American class. Abundance leads in popularity, receiving ten votes; Burbank eight; Red June six and Wickson two. No other variety of any class is mentioned more than once.

QUINCES.

There are thirty negative replies to the question "Are quinces grown in your county with success?" and about half this number of affirmative answers. Blight and borers are the most potent causes of failure. There are very few trees planted for commercial purposes. The demand for the fruit is also greatly limited.

CHERRIES.

The 1904 cherry crop was above the average. A dozen correspondents reported a heavy or very heavy yield, thirty a good yield and only a few reported light crops. Early Richmond leads as the most profitable variety, receiving eighteen votes. Gov. Wood comes in next with ten votes. English Morello six; Black Tartarian six; Large Montmorency five; Dyehouse four; Napoleon four; Yellow Spanish two; May Duke two; Conestoga two; Montmorency Ordinaire two.

GRAPES.

The 1904 grape crop was quite satisfactory in most counties. Seven correspondents report a heavy yield, thirty-one good and nine light. Concord is in the lead as usual, being placed in the list of the three most profitable varieties by forty-three correspondents. Niagara comes in second with twenty-five votes; Worden fourteen; Moore's Early five; Campbells Early four; Brighton four; Moore's Diamond two; Isabella, two, and Delaware two. The spraying of this crop is not practiced to any extent except by commercial growers. They find spraying to be a necessity and it is entirely efficient when properly done.

SMALL FRUITS.

As to which are the more profitable, red or black raspberries, twenty-one growers report in favor of the red and twelve in favor of black. Four correspondents think the two classes are equally profitable. The red berries bring larger prices on the market, but they are more difficult to handle in good condition. There is an increasing demand for red raspberries.

Blackberries are regarded profitable by thirty-one growers, while eleven give negative replies. Some small markets are flooded with wild blackberries at prices that cannot be met by growers of improved varieties.

The cultivation of all classes of small fruits is on the increase in most counties.

VEGETABLES.

Forty-two correspondents report that market gardening is profitable in their localities, while six give negative answers to this question. The lack of good markets is generally the cause of the failures reported. The favorable replies should be most encouraging to our market gardeners and to those contemplating engaging in the business. We believe there are many opportunities for profitable gardening all over the State. A great deal of produce is shipped into our State which could be grown profitably at home.

Cabbage occupies first place as the most profitable vegetable. Early Jersey Wakefield and Charleston Wakefield are most extensively grown for market. For second early, Early Summer and Succession rank high. Next to cabbage, tomatoes are considered by our correspondents as the most profitable, and Earliana the most profitable early tomato. Stone is the most popular late tomato. Matchless is also a favorite.

ORNAMENTALS.

Thirty-one correspondents say there is an increase in the use of plants, trees and shrubs and fifteen report no increase. The members of this organization should exert every possible influence to create greater interest in the beautifying of house grounds, school grounds, road sides, cemeteries, village streets and commons. Such plantations have a value that cannot be estimated in dollars.

NATURE STUDY.

It is a pleasure to report that nature study is receiving increased attention in the rural schools of our State. Thirty correspondents

believe this to be the case, while fourteen say they have not observed any increase. The report, however, is exceedingly encouraging. Nature study in our public schools is not compulsory as in some other states. The teaching of the subject is purely optional in Pennsylvania. We believe our State Horticultural Association and all kindred organizations should work unitedly for the addition of nature study to the curriculum of our public schools. An immense amount of good is being done in New York State by the teaching of nature study, and we would see the same desirable results in Pennsylvania. The farm would be better liked by our boys and the business of farming would be more popular. The power of observation would be developed and perhaps the next generation of fruit growers would detect the presence and destructiveness of insect and disease pests before they have worked such great devastation as has been the case with the San José Scale. Nature study in our schools would impart a vast amount of useful knowledge to the students. It would create an intense love for the beautiful and interesting things of nature which is woefully wanting in the average country boy or girl and without this love for nature we cannot look for happy, contented farmers in the future.

SPRAYING.

Spraying is limited mostly to rather extensive commercial plantations. The results where the work is done with care and skill, are very satisfactory. The practice of spraying is growing slowly but surely.

THE SAN JOSE SCALE.

The San José Scale is the Goliath of the Pennsylvania fruit grower. Although unlike Goliath in stature he is well armored and fully as powerful in his particular work of destruction, and it takes a real David to meet him successfully on the battle field. Many a fruit grower has not had the nerve to tackle the San José Goliath. They have stood off afar and this giant has had his own way in slaying trees by the thousands. Others have mustered together enough courage to go out and meet him, but failed to slay the monster because not trained from their youth up. But the Davids, thoughtful, trained, brave, confident, have gone forth with slings loaded with lime, salt and sulphur, and by waging an unflinching warfare the enemy has been slain.

The San José Scale is evidently present in greater or less number in probably every county of the State, although a few correspondents say they do not know it to be present. Four-fifths of the correspondents claim that it is multiplying and spreading rapidly, the other fifth holding the opposite view or that it is actually decreasing. The damage is variable. The insect has not made material headway in some orchards and no real damage has been done. We think it safe to say that the damages have not yet proved serious in more than half the counties. But the reports from many counties, particularly in the southeastern part of the State, indicate heavy damages. Losses and damage are expressed as follows:

"Some trees killed," "many orchards ruined," "thousands of trees killed," "a serious matter," "much damage done," "thousands of dollars lost," etc.

In many instances nothing is being done to control the pest. This is almost uniformly the case with general farmers who regard the orchard a side issue. It will be exceedingly difficult if not impossible to get the mass of our farmers to spray their large, poorly farmed trees. In fact it would not pay many farmers to spray their old trees, many of which are inferior varieties. Those who make orcharding a distinct business cannot afford not to spray and the lime, salt and sulphur treatment is almost universally applied. Various properties are used in preparing this mixture.

FERTILIZERS.

Commercial fertilizers are generally and extensively used by gardeners and fruit growers. Factory mixed goods are the most commonly employed. There is a growing tendency, however, to prepare the goods at home mixing on the barn floor or other smooth floor. The advantages of home mixing are, first a saving of several dollars per ton; second, getting what you want in the form you want; third, the ration can be mixed to suit the crop for which it is to be applied.

TILLAGE.

Tillage is a necessity to the young tree. All the correspondents who venture remarks on tillage take this position. The young tree must be cultivated until it begins to bear. Then growers do as they please. The same results are or may be procured by different methods of tillage and mulching, or by a combination of these operations. Some continue clean tillage after the trees begin bearing, sowing cover crops in July or August. Others keep the bearing orchard in sod and by careful attention to other matters succeed in producing excellent crops. Some follow a system of mulching the efficiency of which depends on the quantity and quality of the mulch. Conditions are so variable that there is no one best system suited to all localities. The constant aim should be to maintain a hardy, healthy, vigorous growth, and variable conditions require different methods.

NOTES FROM CORRESPONDENTS.

AUSTIN WRIGHT, ALUM BANK, BEDFORD CO.

The planting of new orchards in this county has been on the increase for the past ten years. As the apple is the only fruit which can be conveniently marketed in this section there is very little attention given to any other fruit. Peaches are grown only to supply local demand. Within the past year the San José Scale has been observed in certain localities, but the spread of the pest has certainly not been very rapid. A disease not well understood has been observed in apple orchards within the past few years. In June or July the foliage turns yellow and the leaves fall so fast that

trees are soon almost denuded, after which a new but sickly growth of new leaves appears. The fruit from such trees is very much below the average in size and quality. The cause of this disease has not been determined, nor any remedy applied.

JAMES W. ANDERSON, Stewartstown, York Co.—I am alarmed in regard to the San José Scale, and if there is not vigorous effort made to check its ravages we will be knocked out of business in less than ten years. Our legislature ought to make an appropriation for this very important work and have men visit all fruit growers and nurserymen and compel them to spray.

D. M. WERTZ, Quincy, Franklin Co.—I have tried no new varieties. I have marketed nothing but peaches, selling nearly 22,000 baskets the past season. We are troubled with yellows, but the worst of all San José Scale, woolly aphis, shot hole borer, root gall, crown gall, borers, blight around the collar of apple trees, twig blight and a number of other pests to make ones life miserable.

THEODORE DAY, Dyberry, Wayne Co.—This is third year of big apple crop and most trees have made little growth. Good grafts were scarce last spring and I did very little grafting. Most trees were in poor condition for grafting. A large share of the big crop of apples wasted. Nearly all our farms are rough hill sides and hard to work. All our best young people go to towns or elsewhere, leaving nearly all our farms very light handed, and it does not pay to work them with poor hired help, or to pay high wages.

W. H. STOUT, Pine Grove, Schuylkill Co.—The season was cool and wet, fungus and rot serious, but little damage to fruit by insects. Apples were so abundant that they were unprofitable, with quantities wasted, not with cost of marketing. Plums were abundant and found market at low prices. Peaches being a failure helped the sale of the plums which might otherwise have been unprofitable. Competition is becoming more keen, so that the consumer and not the producer profits by large crops.

J. B. REIFF, Spring City, Chester Co.—We should have some legislation compelling every one to spray or some authorized inspector to see that it is done. We, as nurserymen are compelled to fumigate all our stock sent out and our careless neighbors keep on breeding scales faster than we are able to kill them. While we can send out our stock from our nurseries perfectly clean and in good shape, but planted among stock covered with scales, they cannot grow and we receive censure for sending out stock infested with scales. Until we get some legislation that is much more far reaching than at present we cannot look for an extermination of the scale pest, while the salt, lime and sulphur is number one, there are too many who will not go to the trouble to use it and the consequence is that all suffer alike, the just and the unjust.

OLIVER D. SCHOCK, Hamburg, Berks Co.—Fruit in general was of excellent quality; best in many years. As a judge of the fruit displays at various fairs the past fall, the above was made self evident by the character and quality of the fruit exhibited. The new varieties are also in evidence and some of these are very promising.

The San José Scale has made serious gains and many of the larg-

est and best orchards are menaced by total destruction. In many cases the owners are unaware of the actual conditions until too late.

GABRIEL HIESTER, Harrisburg, Dauphin Co.—In my opinion the severe winter of 1903-4 injured the older peach trees—that is those that had produced several crops. Many of the fruit buds were frozen and the balance appeared rather weak and a great many peaches dropped off when about the size of peas. When the peaches ripened up they lacked size and color. Young trees that had never born a crop before produced fine peaches and plenty of them. Summer and fall apples did very well, but the severe frost on September 22, seemed to loosen the stems of the Baldwin and York Imperial—the small apples did not grow after that, and a great many more dropped sooner than usual at that season—even those that remained on the tree did not keep as well as usual, but had to be sold while the market was full of second class fruit.

Keiffer pears came in the first of October and stopped the sale of good pears entirely. The market has not yet recovered, and I doubt if Duchesse and Lawrence will bring as good prices this winter as Duchesse were bringing at that time.

DR. J. H. FUNK, Boyerstown, Berks Co.—I have planted quite extensively of southern varieties of apples and these are doing better than northern varieties, proving good bearers, hanging well to trees, and proving late keepers. Stayman's Winesap takes first place. I am top working many varieties, such as Stark, etc., to Stayman's Winesap. Rome Beauty is a heavy bearer. Early Winter is of excellent quality and one of the most showy apples we have. Collins Red is an enormous bearer, late keeper and quality medium and a good seller. Mammoth Black Twig, tree a strong grower, medium early bearer, fruit large, dark red, quality excellent, a very late keeper. Black Ben Davis, early and a heavy bearer, fruit very showy, solid red, quality little better than Ben Davis. Gilbert closely resembles Mammoth Black Twig. Salome is not proving satisfactory.

Notwithstanding the condemnation of the public, the Keiffer pear is holding its own and where understood and properly treated it is rivalling the Bartlett in every respect. It is beautiful in appearance, large, quality good, smooth at core, having lost all that rough sandiness for which it is noted when improperly grown and on uncongenial stock they make me more money than any other pear I have tried.

Sour cherries are a good crop, bringing big returns.

Peaches are better than Standard Oil stock, when attention is given, well fed, well pruned and clean culture, they will turn out more dollars than anything you can plant. I have had plenty of trees that have given me from five to twenty dollars per tree. Last season from 100 eight year old trees occupying one-half acre I sold \$1,280 worth. This season from one block of 1,073 trees, covering three years old next spring, they averaged me nearly one and one-half baskets per tree, netting me over one dollar per tree or \$200 per acre and only two and one-half years from planting.

I am getting more fully convinced every year there is no such thing as an off year in any of our fruits where proper attention is given. I know this is contrary to public opinion, but I cannot help it. I have not had an off year for ten years.

R. L. WATTS,
Chairman of General Fruit Committee.

DISCUSSION.

MR. HIESTER.—I am pleased to hear that Ben Davis is not being so largely planted as formerly where conditions are favorable. York Imperial is a money maker, but it must have York Imperial ground. I have seen it grown on bottom lands where it was tough and hard and only sold for third rate fruit.

PROF. BUTZ.—As a preventative of borers I have heard of a resinous sticky material resembling flypaper. It is recommended by the Experiment Station of Michigan.

PROF. SURFACE.—In my opinion it is made of resin and oil, and I think anyone can prepare it.

MR. BROWN, Del.—I am glad to commend the able report of General Fruit Committee which has just been read. It is one of the most valuable and interesting papers I have heard for some years. Some seven years ago I had the pleasure of hearing a similar report by Mr. Snavelly, of Lebanon county, which was also a most interesting and able paper. As to Stayman Winesap, I consider it one of the coming apples. The fruit is beautiful, the tree a good grower and heavy bearer, and I grow it more largely than anything else. I saw it grow in Dr. Funk's orchard some time ago, and I believe it will do well in any part of the State. I saw the Doctor's peach orchard also, and I consider it the finest and most vigorous I ever saw.

MR. CHASE.—I have some specimens on the table from trees five years old, and they have not missed a crop in that time. On one side of Stayman are York Imperial, and on the other, Baldwin and Northern Spy, and Stayman has yielded more than any other variety. It promises to succeed over as large a territory as Baldwin or Stark.

One question of much importance is, the matter of fruit storage. I would like to hear the experience of some of our members.

MR. HIESTER.—I have no storage house of my own, and my only experience is in renting space in regular storage houses, where the temperature can be kept so as not to vary one degree. It costs ten cents a month per barrel, which is cheaper for me than to build a storage warehouse. I have recommended that where possible, farmers and fruit growers go together and build on the co-operative or partnership plan. I saw houses of that kind in New York State, and the contents were in splendid condition.

Prof. Butz, chairman, Committee on Fruit Packages submitted the following report:

To the Members of the State Horticultural Association of Pennsylvania:

Gentlemen—Your committee recommends the adoption of the following fruit packages for the shipment of the several fruits named.
For Apples.—The standard 28 stave, 3 bushel barrel.
For Summer Fancy Varieties.—The stave bushel basket.
For Winter Fancy Varieties.—The bushel box, 10x11x20 inches.
For Pears.—The barrel and half barrel. Fancy varieties in half bushel stave peach baskets.

For Peaches.—The half bushel stave peach basket. For fancy varieties, the twenty pound basket with raised ventilated cover, and 6 basket carrier.

For Plums.—Ten and twenty pound baskets, with raised ventilated cover.

For Grapes.—The four and eight pound basket.

For Small Fruits and Cherries.—The bushel crate of 32 quart boxes, non-returnable.

Respectfully submitted by the

GEO. C. BUTZ,
GABRIEL HIESTER,
EARL PETERS.

Committee.

MR. HIESTER.—At a meeting which I attended in New York State last week, I saw some packages on exhibit to show different methods. It will pay any one who has fancy fruit, to put it up in good shape. In the fall, in the midst of the picking season it requires too much time.

The CHAIRMAN.—I think Mr. Hiester's idea is correct. In Monroe county I have natural cold storage, and fruit as picked is put in large bins. In December or January we pack fancy fruit in boxes, and second grade fruit is sold in bulk.

MR. BROWN.—Repacking of fruit is quite a good idea, but commission merchants generally do not want it, as they prefer to repack themselves. There is a growing trade for fruit in small packages in all our cities, especially the fancy grades. Many persons cannot buy in large quantities, but the general trade could not be handled in small packages.

In shipping apples in Delaware, we use a bushel basket built like a peach basket. They can be packed readily and fruit can be seen.

The following communication from the secretary of "Mississippi Valley Apple Growers Association was read:

Quincy, Ill., Jan. 6, 1905.

To the Officers and Members of State Horticultural Association of Pennsylvania:

Gentlemen: Availing myself of an opportunity to extend cordial greetings and best wishes for a successful meeting, may I ask the

privilege of placing a matter, which many think is of the utmost importance, for your courteous consideration?

It has been generally conceded that the Apple Day feature at the World's Fair last year was highly beneficial to all who had the remotest interest in the apple industry. There is a pronounced sentiment in the middle west of making Apple Day one of the annual events to be generally observed all over the United States.

It has been thought that the date should come in about the middle of each October in order to come closely in touch with the late fall and winter apples and I have not heard of a single objection anywhere against Oct. 17. It is not the purpose to create a holiday nor to form any plan for making assessments or soliciting contributions, the idea being, to allow each national, state and local society to observe the day as they may deem best and proper.

You are well aware that in the month of October the farmers institutes, county fairs and horticultural exhibitions are quite common all over the land and such organizations could easily make a display of apples. Knowing that such a day was to be generally observed you can readily see that there would be a commendable rivalry between societies for making creditable exhibits and also among individuals in showing superior specimens. This would cause a wholesome stimulus in efforts for improving fruit. It can be readily anticipated that there would be a general diet of apples on such a day and this would make a tremendous demand upon all having supplies. It would naturally cause many interesting comments of the public press and would be a powerful means of keeping the apple prominently before the people.

The average orchardist will perceive the necessity for such a movement. There will be some places where there may be no production of crops and growers in such a vicinity would gladly hail any movement to help sell their fruit. It of course would follow that it would give a profitable awakening to buyers and shippers. What is respectfully asked of your association is to give a moral support to the movement by adopting a resolution which would carry your sanction.

Hoping that you will look upon the matter favorably, I am, with best regards,

Yours truly,
JAMES HANDLY,
Secretary.

On motion of Mr. Hiester the communication was referred to the Executive Committee.

MR. HIESTER.—Referring again to my attendance at the Horticulture meeting in New York State last week, I want to say that I concluded that in New York they are far in advance of us in Horticultural methods. One exhibit, showing the results of spraying potatoes interested me greatly, and was one of the greatest features of the meeting. The results of spraying for "Leaf Curl" and "Brown rot" were also important object lessons. It was found that when San José Scale was controlled by applications of lime, sulphur and salt, Leaf Curl and Brown Rot were also kept in control. I saw Pennsylvania apples there grown in the Experiment grounds, and

"Smokehouse" were nearly as good and well grown as in their native state. As grown there, they find it almost a winter apple. We want in this State a bureau of information that will advise us to best soils and altitudes for different fruits, and what varieties are adopted to certain localities. The possibilities and conditions of our State are not fully understood and can be studied to great advantage. As to varieties a Canadian fruit grower stated at the same meeting, that in their province growers were restricted to six or eight varieties, and at their fruit exhibits no premiums were given for more than ten varieties of apples. Their idea is that quality should be the keynote, rather than quantity. In Pennsylvania, in addition to the question of production we should also study that of distribution. Let our society discuss the larger questions of business when we meet but once a year.

PROF. WATTS.—I am much impressed with the remarks just made, and agree that our meetings should be more business like, and larger displays of fruit should be encouraged. Raspberries, blackberries and other small fruits should have more consideration.

MR. SCHOLL.—Objected to the usual method of reporting our fruit exhibits by the committee, and contended that more attention is given thereto.

On motion of Mr. Peters the chair was authorized to appoint a committee of three to examine new fruits on exhibition and report upon the same.

MR. BLACK (New Jersey), inquired whether this organization pays any premiums on exhibits of fruits and stated that in his state \$2.00 is paid for finest display. You have here a nice display, but in our exhibits we allow no one to exhibit less than four or five specimens. As an inducement for the displays of fruit there is nothing like giving a man a dollar or two for a choice display. The New Jersey Society receives \$300 per year from the State.

MR. BRIDGES.—I would like to have some information concerning Jonathan apple. I am interested in fruit culture on the South mountain, and would like to know what are the best varieties for that location. We want to plant what will pay best. We have York Imperial, Gano, Stark, and would ask what are other promising varieties.

MR. CREASY.—Jonathan is considered the standard of excellence. I have been trying to grow it, and find it can be grown to perfection on deep soil.

MR. MILLER.—Have grown Jonathan and they did well for a while, then dwindled away and were of no value.

MR. BROWN.—Jonathan will grow on almost any altitude high or low. It has character and quality and with Spitzenburg, may be considered among the best. It wants cultivation and attention, and needs spraying and thinning. I consider it one of our most profitable varieties.

MR. WERTZ.—Will Mr. Brown give his method of preparing his lime, sulphur and salt mixture for spraying? Have read about it and would like to have further particulars.

MR. BROWN.—My experience of mixing lime, sulphur and salt without boiling has been that it is equally as effective as the boiled wash. I first employed this method in 1903, and was followed in

1904 by others, who report success. When I started using lime, sulphur and salt four years ago, I used it according to the California method, boiling it one and a half hours, using the full formula, 40 pounds of lime, 20 pounds of sulphur, 15 pounds of salt and 60 gallons of water. We have a rigid law in Delaware, making spraying practically compulsory. Our first infestations of scale are traced as coming to us from New Jersey. Owing to the generally bad effect of oil, I was led to use the less dangerous but more effective wash, lime, sulphur and salt. The first two years I used it, as already stated according to the California method. This being so laborious and slow, and in view of the fact that good lime when slacking generates a heat of about 300 degrees, I conceived the idea of making this wash by allowing the lime to cook it, and I proceeded in the following manner.

I took 20 pounds of pure sulphur, put it into a vessel, poured over it a little at a time, 2 gallons of boiling water, stirring well all the time, this gave me an excellent sulphur paste. I then took a barrel that would hold 60 gallons, put into it 40 pounds of the very best stone lime obtainable, onto this lime I poured 12 gallons of boiling water, I immediately added the sulphur paste previously prepared, covered the barrel quickly with a double burlap sack, and left this mass cook for 25 minutes, occasionally stirring it a little with an old hoe, but not sufficient to intercept the boiling. When boiling ceases I fill up with warm water the required 60 gallons, then add the 15 pounds of salt, stir well, strain well into spray tank and supply when fresh and hot to obtain best results. If this has been properly made it should stick on the tree when it strikes it like good paint, when it runs like water it is no good and had better be thrown away. I have added the caustic potash to continue the boiling and do not believe it is any benefit but rather an injury as it will under certain conditions precipitate the lime, as you will always find a larger residue of lime where a barrel of the wash is sprayed out when caustic potash has been used, than where it has been left out.

My use of lime, sulphur and salt has been extremely satisfactory, although I have not been able to fully eradicate it on six Stark apple trees 25 years old. I believe this wholly due, however, to the hairy character of the outermost tips of apple branches upon which it is extremely difficult to get the lime, sulphur coat to stick.

This wash is a sovereign remedy, and as good a fungicide as it is an insecticide, thus performing two offices at one application.

Its use is not attended with any danger whatever, while great care must be exercised in the use of oil.

I have been very successful in my method of preparing this wash, and hundreds of growers who have followed this plan in 1904 have been equally successful. In inexperienced or indifferent hands I would recommend boiling the wash, but in methodical, careful hands, much time and expense can be saved by following my method.

DR. KOONS.—What is the difference in kind of sulphur used?

MR. BROWN.—Sublimed sulphur is supposed to contain more acidity. As to how long this wash will stick would say that applications made in March last, can still be distinctly seen. It might be washed off by a severe east wind if it came soon after the application was made.

Adjourned.

ADDRESS OF THE PRESIDENT.

Evening Session.

To the Members of the State Horticultural Association of Pennsylvania:

During the years that I have been honored as your President, it has been a matter of regret to me that I was not in a position to accomplish more for the horticultural interests of our State.

When I accepted the Presidency, it was my ambition to inaugurate a movement for the formation of County Horticultural Associations, the same to be auxiliary to our State Association. I, however, found myself unable to give the necessary time to the undertaking, and left it for those following after me.

It is to be regretted that this, the State Horticultural Association, is not more closely in touch with the fruit growers and horticulturists of the Commonwealth, and that our membership has not extended into every county of the State.

I understand that the Department of Agriculture, through its Economic Zoologist, Professor Surface, has availed itself of every opportunity to call the attention of the fruit growers to the State Association, but the response in the way of increased membership, although encouraging, has not been what we had hoped for.

Unfortunately, the proceedings of our meetings and the many valuable papers read at the same cannot under the present system be promptly published and distributed among the members. Could this be done, I am of the opinion that much good would result.

Also, it is to be regretted that there cannot be an annual exhibit of Pennsylvania fruits; this in a manner to encourage our fruit growers and educating our people as to the most desirable varieties and the best methods of raising the same.

Should the Legislature make an appropriation for this purpose, it would be money well invested.

Some view with alarm the growing tendency to ask State aid by the many civic and industrial associations, but I see in this tendency nothing at which to be alarmed. Paternalism however exercised has no terrors for me.

We read that the Lord helps those who help themselves, and under existing conditions, I think the State should in many ways render assistance to those who are endeavoring to help themselves.

I will go further. I contend that under its police powers, it is the duty of the State to protect as far as may be practicable the careful and enterprising farmer from his slovenly and careless neighbor.

In the early history of the State, the farmer would make his little clearing, erect his cabin, and sow the seed for his future orchard. As these trees would come into bearing, he would find that some would yield satisfactory fruit, while in other cases, the fruit would be worthless, except for cider.

Then came the itinerant tree grafter who would top graft the worthless trees to improved varieties. During this time there was

little or no commercial orcharding for the reason that the cost of transportation was prohibitive.

Also, during that time, insect pests and diseases with which we are now confronted, were practically unknown.

Now with modern transportation facilities large orchards have been established, and under existing conditions every man who establishes such a commercial orchard is to a greater or less degree threatened with serious injury by the negligence of his neighbors who will allow the pernicious scale and other insect pests and diseases to remain unchecked upon his trees and hedge rows.

Where such conditions exist, I contend that by right the authorities should intervene to afford protection from such menace.

I would not elaborate upon this point by citing the numerous statutes under which the authorities of the State are now fully authorized to protect life and property, and to stamp out the diseases that are a menace to live stock and to health.

Some may contend that inasmuch as the orchardist is growing fruit for profit, he should protect himself, but let us realize that the more favorable the conditions, the more easily can fruit be grown, and that the natural increase in the supply will make fruit more plentiful and cheaper for the average consumer, and that while the fruit growers may number thousands, the consumers number tens of thousands.

It is a lamentable fact that to-day Pennsylvania with its diversified soils and climates is largely dependent upon its sister States for its supply of fruits. I will not tire you with the figures of the supply of other States in comparison with Pennsylvania, but when the day arrives, as it will eventually arrive, when Pennsylvania grows all of the apples, pears, peaches and small fruits that its people can consume with a liberal margin for exporting, there will be a marked increase in the wealth of the State in its revenues, and last but not least, there will be an improvement in the health and contentment of its people.

Although our Association during the 46 years of its existence has accomplished much for the horticultural interests of the State, it is not reasonable to expect a civic organization of this character without State aid to accomplish all that could be desired.

In view of this, I am heartily in favor of the creation of a Division of Horticulture in connection with the Department of Agriculture, the same to be under the administration of a practical horticulturist, who shall be paid a salary sufficient to justify his devoting his entire time and attention to the horticultural interests of the State.

I am in favor of appropriating to such a horticultural division a sufficient amount to inaugurate and maintain a systematic and effective educational work.

Simply as a business proposition, I contend that every dollar invested by the State in this direction will be returned to the State ten-fold; yes, an hundred-fold.

I would have the work of this Department confined not only simply to the encouragement of the development of our fruit interests but to the adornment of our yards and laws. It is not surprising that the average farmer feels that he has neither the time nor the

means to do much in the direction of floral decorations about his place, and yet in the majority of cases on his own farm and along the road side can be found beautiful and desirable native flowers, shrubs, and vines, which can easily and quickly be dug and transplanted, and so arranged as to make the bare forlorn corners and edges of his front yard very attractive to the eye. A little work in this direction and possibly a little money expended on varieties that do not grow in his neighborhood would very quickly make his place worth more to sell, and vastly more to keep.

"HOW SAN JOSE SCALE TRAVELS."

HISTORICAL.

In 1887 the writer began to plant fruit trees on the south side of Lewisburg. In the same year, Mr. G. Wolfe planted on the west of the town, in the village of Linntown. In 1893, the trees and plants on both our properties were dying from San José Scale. They were infested sometime prior to 1893. My property is immediately adjoining Lewisburg. Mr. Wolfe's is one-fourth mile to the west. Until 1902, the scale was not perceptible in my end of town. It has not yet appeared in west end, and Mr. Wolfe tells me that none of his neighbors have as yet complained of the Scale. South of my property, within a half mile are three orchards. Scale was observed two years ago in one of these, but upon newly planted plum trees. The nearest orchard to mine is about 300 yards and is not yet infested. Across the river one-half mile is an orchard infested, though young trees. In Germantown, Pa., the scale is known to have traveled one mile since 1896. In the writer's observation the scale travels with extreme slowness, after being once planted in an orchard.

HOW IT TRAVELS.

It walks for a few days after birth and at a rapid rate for so small a creature. In Central Pennsylvania it can be seen moving first about June 15th, and from that time, so long as there are warm days, even until in November. It certainly walks to adjoining trees where branches interlace, and so spreads rapidly. It also spreads in this way rapidly in nursery rows.

Given an infested tree, it spreads in an orchard, very slowly, to the trees immediately adjacent, and so passes in time over the orchard. It would seem that it can sometimes get from tree to tree over the ground, for in young trees, it is especially at first found upon the trunks of the trees, and upon the under branches. To illustrate its slow movement from tree to tree, in 1900, in a row of trees on the writer's property, two trees were infested, and the scale be-

gan to travel along the row. Now, although the branches interlace, the scale has not yet reached the ninth tree, which is to-day free from the scale.

The wind may possibly sometimes waft it to nearby plants. Possibly it travels on ants, or other small insects. Some have been quite sure it is conveyed upon the horse used in working orchards, but this does not seem to the writer probable. Birds, and especially the English sparrow, have been credited with spreading the scale. If this is so, then it would seem that it makes use of birds, as a vehicle, as little as possible, and against the bird conveying theory, we would urge, first, it is commonly found upon the under branches of a tree first, in a word in the places where birds would be least likely to alight. Second, The scale selects its host, or plant on which it will live. If careful to do this, is it not also careful to select the vehicle by which it travels? We think so. Thus it avoids the cherry, the Kieffer pear, and forest trees generally, while it selects for its home the currant bush, Japan plum, Japan quince, Ben Davis apple, Seckle and Anjou pears, and the Rosaceae family generally, though there are exceptions.

But if we do not know how it gets from tree to tree, we do know how it has been spread over the State. It came to the writer's property on nursery stock, and it has been carried all over the State in the same manner. All know that this was true in the past. It is still true. During the past summer the writer visited three nurseries in this State, all recently infested from purchased stock, one from Maryland, one from Iowa, and one from New York. In all cases our nurserymen thought they were getting clean stock, and for a time, at least, they disseminated infested stock, not knowing that they had the scale.

There are still dealers in trees who do not believe the scale to be really dangerous. Such do not hesitate to sell infested trees wherever they can. There are others who place the burden upon the State, claiming that after they receive a certificate of freedom from scale, they are free to sell, without further concern, even though the scale may be afterward found upon their stock.

The scale is nearly microscopic in size. It may escape a hasty inspection and a careless fumigation. It does so escape. The fact is, that to-day after all that has been written and done, scale in large quantity is being disseminated on young stock, and will be so disseminated until greater care is taken with both inspections and fumigations. Dealers need much fuller instructions upon fumigation, and it is a question whether or not all fumigation should not be done under State inspection.

Another matter that should receive attention. A nursery once infested should ever after be required to fumigate all its stock, or such stock as the insect inhabits. So difficult is it to find the minute insect, that this precaution is a necessity.

Inspections should also be delayed so far as possible until after the leaves have fallen, for it is well nigh impossible to do good work with the trees covered with their foliage. It is the opinion that so far as farms are concerned, the scale cannot spread from orchard to orchard, and that an infested orchard is no great menace to the neighboring farm. In villages it is different. There the scale may pass from lot to lot, though generally but slowly.

THE FOREST IN ITS RELATION TO HORTICULTURE.

By I. C. Williams, Deputy Commissioner of Forestry, Harrisburg, Pa.

The relationship existing between forestry and horticulture may or may not be near or intimate. The effect of the forest upon what the horticulturist concerns himself with may not be apparent to the casual observer; but such relation is no doubt real. This effort, therefore, will be directed toward showing how and why it exists, the benefit to be derived by one from the other, together with some suggestions which it is believed would be well for the Association to consider.

One of the very important uses of the forest is the conservation of moisture. A treeless region is a dry country, sometimes arid and sandy. A dense forest cover shades the ground, and prevents the effect of the direct action of sunlight, rapid evaporation. The forest floor, if protected from fire, will soon be covered with a thick mulch. The roots of the trees, penetrating deeply, form bonds to knit the soil together, as well as water conductors to carry surplus rain beneath the surface. The mulch receives water and holds it as a sponge, prevents rapid flow-off, and covers the forest floor as a wet blanket. In a treeless region the rains beat the soil, from the top of which the water rushes, usually carrying a considerable part of the soil therewith, the streams and rivers are gorged with water, following which is the usual destruction of bridges and fences, inundation of lowlands, and deposition of silt, gravel, and other debris upon valuable meadow lands. What does not thus flow off quickly evaporates, and is dispersed by the winds. Without the great natural reservoir, the forest, the water is speedily gone, dryness follows with its inevitable injury to vegetation.

With the forest cover intact, a small part of the falling rain is immediately returned to the air by evaporation from leaves and branches, some is absorbed, a part descends trunks and following the line of roots reaches deep underground strata, while the remainder is held by the mulch and slowly allowed to sink below the surface. Very little of the rainfall thus runs directly off. As a result of the above, springs are steadily fed, a moderately even flow is maintained, no unusually high water stages are followed by unusually low stages. While the rain may descend never so hard, a stream flowing from a well wooded region is seldom if ever colored by the washing of soil.

Among the functions of the leafy part of the forest is the exhalation of watery vapor into the atmosphere. It has been calculated, from experiments, that a square mile of average forest will exhale three and a third millions gallons of water in a month, or one hundred and ten thousand gallons a day, being two thousand barrels of fifty-five gallons each. This is no inconsiderable amount.

In seasons of more than average dryness an amount of vapor such as the above, added each day to the atmosphere, must have a beneficial effect upon all forms of smaller vegetation, for descending at

night in the form of dew, it furnishes a considerable part of the moisture necessary for ordinary growth.

It is maintained by some that the presence of large wooded areas is conducive to rainfall. The investigation of this question has not yet yielded satisfactory results. It is certain that the forest does in no way check the volume of rainfall. It is held by many that when the great volume of watery vapor rises into the atmosphere to the cloud forming strata of air, it is, under favorable conditions, but a step to the point of complete saturation and precipitation.

The forest is a soil former and in this way may be of value to the horticulturist. The roots bring up from the depths of the earth mineral plant foods which find their way back to the surface of the earth in the form of twigs and leaves, there to decay and form the valuable humus or mulch, found in every protected forest. A small wooded area will furnish many hundred loads of rich forest soil which may be used by the Horticulturist on thin or well worn soils with the best results, as well as employed for the lightening, sweetening, and general improvement of heavy soils. So well known is the forest as a soil former that on the continent of Europe worn out areas are planted with quick growing trees. At the end of thirty years the trees are marketed and the soil is found to have regained its former vigor and excellence, now ready for the intensive farming which characterizes those thickly populated countries.

In some localities vegetation suffers greatly by reason of the intensity of storms and prevailing winds. Horticulture under these conditions must of necessity suffer severely. The wind bloweth where it listeth but its force can be diminished and consequent destruction of small fruits and tender vegetables decreased by the planting of suitable trees to act as a wind shield or screen. Nothing better of the kind exists than a nearby wood heavily timbered, interspersed with hemlocks, firs, and other low spreading coniferous trees. It is the experience of many fruit growers that among the most dangerous obstacles to their business are the violent storms likely to occur at times of greatest disadvantage and without warning. A more generous forest planting, or an adaption of lands for horticultural purposes well situated with respect to forested areas could not be other than helpful.

In localities where the soil is light, thin, and disposed to be sandy, another obstacle to the art of the horticulturist is dust storms and the shifting of soil by means of the wind. With the force of the wind broken by the intervening forest, the dust and sand deposited within, or on the windward side of the wooded land, the forest takes the place of a great filter, allowing clean air to emerge and preventing flowers, fruit, leaves, the sensitive organs of orchard and garden plants, from being choked with dust, sapping their vitality by the absorption of watery juices, to their most certain injury, rendering such fruit unfit for the market, and destroying hopes of profitable return to the owner.

Another benefit which, it is believed, the forest confers upon the horticulturist is its probable effect of retarding early frost. It is a well known fact that a cloudy night at the beginning of the frost season means freedom from frost for that night. The orange growers of Florida and the grape growers of central New York

build great smoke or smudge fires, covering their orchards and vineyards with a blanket of smoke, preventing the radiation of heat, consequently removing danger of frost. Over an extended forested area, interspersed with farms and gardens, much the same effect can be produced. The watery exhalation from the forest, hereinbefore spoken of, condensing overhead into the form of low hanging clouds, acts in the same way as the smoke blanket, or a general cloud covering. Of course no such effect could result from forests of diminished size or ordinary woodland.

The horticulturist, along with all other enjoys many common advantages or benefits of the forest. The question of irrigation is one that does not confront the Pennsylvania fruit grower, but it is a most vital question with his brother in California and other arid regions of the west. Without the forest to conserve the snow and rainfall, there could be little hope for extending the benefits of irrigation.

Such being the benefits conferred upon horticulture by the forest, we look in vain for benefits to the forest conferred by the practice of horticulture. In other words, the two do not stand in a reciprocal relation. It is wholly a one-sided matter; but the horticulturist can, indeed, lend his influence toward the protection and preservation of the forest. He can, in the first place, refrain from destroying it, should he happen to be the owner of any considerable forest area. He can protect it from fire and spoliation, and insist that others do the same. He can extol the virtues of the forest. He can educate himself and his children to look upon it as a great natural inheritance, "to be wisely used, reverently honored, and carefully maintained."

MR. CREASY.—This is a subject in which I am much interested, and will be one of the great questions of the future. The subject of rebates is one that has not been fully met. In sparsely settled townships and counties in which are large tracts of forest, money is needed for roads and schools, and where rebates are granted the amount must be made up on other property. In our county the great danger to forests from fires started by railroads, and if there were some way to compel these corporations to assist in extinguishing them, a great step would be gained.

MR. McSPARREN.—In justice to one of our railroads, I would state that it is very careful to keep its right of way clear of anything that might cause fires. They have track walkers who act as wardens.

MR. PETERS.—In Southern Pennsylvania there are thousands of acres of forest almost covered with undergrowth, and have been almost bare of trees for 25 years. Nearly every year these forests are set on fire by freight trains, and nothing is said about it. It has been suggested that owners of large forest tracts be compelled to divided them into sections, and open avenues through them, so as to facilitate the handling of fires. I think twenty-five or fifty dollars paid annually to a conscientious man would guard or protect 5,000 acres.

DR. GROFF.—Mr. Peters' views in many particulars correspond with my own. If we could imprison the men who start fires it would be a great gain. In addition to the causes of fires already mentioned, the material left in the forests by lumbermen is a very

important factor. As to the system of rebates allowed by law, it is not so much unconstitutional as impracticable. The deficiencies occasioned by such rebates must be met by additional taxes on other property. This work of replenishing our forests has just been begun, and is one of our most important problems.

MR. STOUT.—My county is covered with immense areas of forest and no attention is paid to the extinguishing of fires.

MR. BRIDGES.—No one is more interested than we who are engaged in fruit culture and have large fruit interests.

MR. WILLIAMS.—I am delighted to hear this discussion, and am pleased to see the interest that is manifested in the forestry question.

I have been convinced that constables as a rule are inefficient fire wardens and are not to be depended upon. I know that one half of our forest fires are started by railroad engines. The remedy lies with the Legislature, and if the people will pay the bill, the Department will see that the fire question is met by putting a man on every square mile of forest. The Governor's message recommended that for a distance of 100 feet on each side of the tracks, railroad companies should be required to extinguish all fires. We have about fifty men for 600,000 acres, a force manifestly inadequate.

MR. CHASE.—I think that no one present is more heavily taxed or harder hit by forest fires than the president of this association. We have many fires in my district in the north eastern part of the State, and the section hands are not as careful as they should be. A large per cent. of the people there depend upon the huckleberry crop, and it is their object to burn over our forests about every three years. Over and above all we must try to educate our people that it is their interest to protect our forests.

On motion of Mr. Creasy, the chair was authorized to appoint a committee of three to draft some plan of procedure to present to the Legislature in reference to this question.

Messrs Creasy, McSparran and Chase were appointed.

The following committees were announced:

Deceased Members.

W. H. Moon, S. Morris Jones, James Krewson.

Legislation and Allied Organizations.

Gabriel Hiester, Chairman; Earl Peters, John G. Rush, H. A. Surface, Howard A. Chase, Enos B. Engle.

The following paper was read by Hon. W. T. Creasy, Catawissa, Pa.:

SHOULD QUALITY OR QUANTITY BE OUR AIM?

More than fifty years ago the author of Barry's Fruit Garden said: "The fine fruits that were formerly considered as luxuries only for the tables of the wealthy are beginning to take their place among

the ordinary supplies of every man's table; and this taste must grow from year to year, with an increased supply." The family that consumes a bushel of good fruit this year will want a larger quantity next year. Since it, would appear that both quantity and quality should be our aim, and in the great desire to secure quantity we let go of quality, and by having poor quality we need not so much quantity, so of the two I prefer quality and so do you, at least for our use. But when we produce fruit for sale we often think the people want nothing but quantity when in reality with a little education they also want quality. Then what is the effect? The fruit with quality will sell while the poor fruit must waste, and is this not about the condition of affairs we have arrived at in the fruit business in this state, as well as in the United States?

I believe the planting of fruit is being overdone, and those who have planted varieties for quantity only will find no market for their fruit, at least not at profitable prices. A few years ago fall and winter pears of the varieties of high quality brought good prices, but the large planting of the Kieffer drove out quality, and to-day we are awakening to the fact that the Kieffer pear is selling for little or nothing and I will venture the prophecy that in a few years people will again pay the price for quality. The Kieffer pear has often been compared to a potato for quality. While I will not affirm or deny that its quality is poorer, I do say that the price is less than that of potatoes. I question very much whether the per capita consumption of pears to-day is as great as it was ten or twelve years ago, when there was a larger per cent. of better pears in the market.

In our section of the State we had a big apple crop and thousands of bushels went to waste, principally from two causes: First, there seemed to be no co-operation among the growers to dispose of their crop; and, secondly, many were of such poor quality that the only way to get shut of them was to let them rot on and under the trees. I disposed of a car-load of Baldwins to a customer in Nebraska, and the principal reason why I could sell them to a customer so far away was because they were not Ben Davis. I met one of this man's employes a few days ago and asked him whether they had no apples in the West and he said, "We have Ben Davis, but our customers know that apple too well and would rather have none than that." I asked him how about the York State apples, and he replied, "They are too green, while yours are nicely colored, and carefully packed."

The apple market has been more or less demoralized this season and it is quantity and not quality that has made the business unprofitable. A great deal of money can be saved and made by digging up fruit trees and plants bearing worthless fruits.

Another general cause of poor prices is our carelessness in culture and getting our fruit on the market. The greatly increased cost of labor there must come a revolution in the fruit business and I know of no better time to begin than now. The future will demand quality, and if we wish to stay in the business we must accede to these demands by planting better varieties with better cultivation and better methods of disposing of our fruit after it is grown.

In a fruit garden quality is still more desirable than in a commercial orchard, for here it is that we intend to take our own medicine. How much we are disgusted even with ourselves when we come to

eat fruit from our own garden that lacks quality. One bunch of good grapes is worth a bushel of sour ones. It is in these gardens that the happiest days of man's life are spent, be he rich or poor, merchant or mechanic. No farmer or laborer can look upon a fine fruit garden but to be filled with the highest emotions of the true, the beautiful and the good. But alas, my dear friend, should you be so unfortunate as not to possess that beautiful fruit garden, and perchance your neighbor does, and should you take a sly peep over his garden wall and behold a Ben Davis apple or a Kieffer pear, would you not keep the Commandment "Thou shalt not steal," and pray the Lord to have mercy on the man that planted them and the nurseryman that grew them.

MR. PETERS.—We frequently receive at our office some such statement as has been made in the paper just read. Still, there are certain people who will plant Ben Davis apple and Kieffer pear tree, and I know parties who say that Ben Davis is the best culinary apple grown. Mr. Brown can tell you something about Kieffer pears that will surprise you. It costs less to grow them than potatoes and they are not easily killed by San José Scale. I can deceive one third of the members of this association on canned Kieffers, and we want some reasons for denouncing varieties of fruit that are so popular with the masses. If I had 1,000 Ben Davis apple trees I would not change them.

MR. MOON.—I did not know there was so much room for missionary work in Mr. Peters' county.

MR. PETERS.—One of the most convincing arguments is our apple buyers who offer 25 to 50 cents per bushel more for them than for other kinds.

MR. CHASE.—There is no question that Ben Davis and York Imperial will sell, but the dissemination of such varieties must have a tendency to decrease the demand for apples.

PROF. WATTS.—Judging by reports sent to chairman of General Fruit Committee, York Imperial is losing ground. One year ago it stood first on the list of desirable apples in this State. Now it is second.

MR. HIESTER.—It seems to me this only emphasizes what has been on my mind for years. There are locations in Pennsylvania where Ben Davis and Gano can be grown as well as any where else. My object in fruit growing is to make money, but I always try to sell a man something that will induce him to patronize me again.

MR. BROWN.—Mr. Hiester ought to come to Delaware, where we net \$150 dollars per acre for Kieffer pears. While I am in hearty accord with Mr. Creasy's paper, at the same time I grow things for money. There are two classes of customers. We have an educated, wealthy class that wants the best that can be had, and Horticulturists must plant for that class. Then we have a laboring class in all communities that will buy an article because it is cheap. My Kieffer orchard is the oldest in Delaware. I have improved their quality by cultivation, fertilization and thorough spraying. The Kieffer has no equal as a preserving pear. It has a quince flavor peculiar to itself when put into glass. The tree is hardier and more productive than any other. As for Ben Davis, it has brought more dollars to American apple growers than any other apple, but I

would not want it for myself when I can get Stayman, Jonathan or Rome Beauty. Last year 85 per cent. of my crop was absolutely perfect.

PROF. WATTS.—What are the claims made for Stayman?

MR. BROWN.—Trees bear younger than York Imperial, and ripen a larger per cent. of good apples. It is decidedly more profitable than Rome Beauty. We also have an apple called Nero, and the tree at 18 years old yielded 44½ bushel baskets of fruit which sold for more in Philadelphia, than New York Baldwins. It bears every year and is beautiful and uniform in color and size.

MR. REED.—I find that Kieffer on heavy soil will yield large fruit of poor color and quality. On sandy soil it is usually of good color and quality.

Adjourned.

Wednesday, 9.30 A. M.

Having been called to order by the President, the treasurer's statement was read showing a balance of \$8.60 on hand.

The following letter was read by the secretary.

January 17, 1905.

Mr. Enos B. Engle, Secretary of State Horticultural Society, Harrisburg, Pa.:

My Dear Sir: I beg to acknowledge the receipt of your notice of the meeting of the State Horticultural Society, which meeting it was my purpose to attend. I am sorry to say, however, that a wire message from my home, announcing the death of one of my closest friends calls me away, and will make it impossible for me to be with you. Hoping that you may have a very pleasant and successful meeting, I am,

Very truly yours,

N. B. CRITCHFIELD,
Secretary of Agriculture.

Prof. H. A. Surface and Gabriel Hiester were appointed a committee to wait upon Governor Pennypacker, and invite him to the meetings.

Mr. Cooper, chairman of Committee on Nominations, submitted the following list of officers for 1905.

President.—Gabriel Hiester, Harrisburg.

Vice Presidents.—Hon. W. T. Creasy, Catawissa; Thos. B. Meehan, Germantown; Dr. J. H. Funk, Boyertown.

Recording Secretary.—Enos B. Engle, Waynesboro.

Corresponding Secretary.—Wm. P. Brinton, Christiana.

Treasurer.—Edwin W. Thomas, King of Prussia.

Mr. Cooper was authorized to cast the ballot of the association and the aforementioned were declared elected.

The selection of a place for next annual meeting was taken up.

Mr. McSparran named Lancaster.

MR. PETERS.—While we were well treated, and had an excellent meeting at Lancaster, we met there only a year ago, and I extend an invitation to come to Gettysburg. I invite you in behalf of our Adams County Fruit Growers, who will be glad to have you come

there. We have a Fruit Growers Association of some 40 members in our county all growing leading varieties. You will also be able to learn something of conditions existing there.

Gettysburg too is historic ground and extends the hand of welcome. Mr. McSparran withdrew his nomination of Lancaster, and Gettysburg was unanimously chosen.

The following paper was read by W. H. Stout, Pine Grove, Pa.

THEORY vs. PRACTICE.

If we go back in imagination to that remote period when the human race had evolved to a more intelligent and reasonable creature than brute creation; in the wilds of the world, upon his own resources, among other animals, and increasing numbers of his race, the struggle for existence intensified, by increasing population when sheltering places in hollow trees, caves, and caverns were all preempted and occupied. The theory of constructing sheltering tents for protection suggested methods not then in practice. The theory has been improved with the advance of civilization from the rude tent of leaves, bark or skins to this period of sky scrapers. Inexperienced, untrained and uneducated subsisting upon the products of nature, dieting upon roots, herbs and wild fruits as vegetables, and upon turtles, snakes, snails, fish and such small game as the first instrument in use—a wooden club—supplied him with meat, until the easy available supply became exhausted, when improved methods—a necessity—the theory of using stone axes, hammers, and spears, the bow and arrow with pointed flint, ushered in the stone, to succeed the wooden age. Ambition, envy, rivalry, feuds and conflicts, were settled by combat between individuals and tribes and the theory of conquest and possession through practice became the law. Theory suggested hollow logs as suitable vessels for navigation and fishing, and the wind driving the craft, suggested something to catch the breeze as a propeller.

An unfortunate animal or a nutbearing bush overwhelmed with hotlava from a volcano, or by fires kindled by lightning's flash, roasted the food which was found superior to that in its uncooked condition that the theory of cooking and the use of fire in domestic economy became a practice and when not otherwise obtainable fire was kindled by friction, until the iron age introduced the flint and steel, science the friction match, and the electrical appliances so common in our time. It is only 400 years since this country possessed by red men was discovered and found the natives in the same condition as was Europe earlier while Egypt and Asia had advanced to the bronze age, while iron was not in use until at a later period.

Ignorant people ridicule theory and when scientific persons appear before them as instructors, they are looked upon as imposters, while in their daily pursuits the same persons who speak flippantly of science, make use of theories conceived and put into practice long

ago. Before Gallileo's time, "the morning stars sang together for joy," the planets were guided by celestial hands, and lightning was the angel of the Lord. In this early period theory was a dangerous thing to the theorist, but navigation owes its success to the once ridiculed science of astronomy, and agriculture to the theory of cross-fertilization, and the animal industry to the careful study of biology by Darwin. When in 1752 Franklin, accompanied by his son, drew electricity from the clouds with his kite on the commons of Philadelphia, he went quietly, for fear of ridicule should his theory result in failure, because then, as at present, there were people who were superstitious about things which they did not understand. It is only a hundred years since Philip Ginther, while hunting on the mountains near Summit Hill, found a black stone which theory led him to believe it might be stone coal, which it proved to be and was first quarried in 1792, but its use was not known, and would not burn readily, it was used on garden walks in Philadelphia until after repeated efforts and failures, the closing of furnace doors to avoid danger while away to dinner, its value as fuel was accidentally discovered.

There are accidental discoveries of useful things, as for instance Bordeaux mixture; nitro-glycerine; the virtue of Peruvian bark and other things; but in a general way theory, always has a share in the practical application of discoveries. The theory of bacteria in soil, that of obtaining nitrogen from the air by chemistry, to that of navigating ships in the air are being practically worked out, while that of making rain and disseminating hail storms by explosives are held in obedience. Like trusts, there are good theories and bad theories, among the latter, that by having had good roads, we might have hauled ourselves rich, according to logic of wheelmen, owners of fast horses and automobiles. That the losses sustained through insect injury, and other causes fabulous fortunes are missed, yet frequently the things produced do not pay cost of production.

Forestry is to abate all future taxation for coming generations. The theory entertained in some quarters that the farmers have been educated to such a high degree that none but college graduates and professors, with suffixes, Sc. D., Ph. D., Ph. C., A. B., B. S., M. A., M. S., and possibly L. L. D. These are theories that it is hoped **may** be realized, but it's not likely to happen before the millenium. In theory we can fertilize, trim and spray our fruit trees and make them resistant to any contingency of weather conditions but in practice the thermometer, indicates a low temperature after some warm days swelling the buds, or a May or even June frost may find the blossoms open and destroy our prospects and all our pet theories in a night.

Theory and practice go together while theory is before practice it may be designated the advance agent to progress. It is necessary in practice to give new theories careful consideration to decide whether they can be adapted to our conditions. The advocates of constant cultivation, mulching, planting stub trees, repeated spraying, might find their theories useless and impracticable under different conditions and other locations. We have some excellent teachers in the different branches of agriculture and some who know very little about any. It is related that an agricultural and city editor

of a town paper, visited a friend in the country, arriving with a conveyance with the proprietor was away. They undertook to unhitch the horses, and after unbuckeling permanent fastenings and unnecessary parts, put the horses in the stable. They tried to remove the collars, and after pulling and tugging in vain, concluded that the collars were put on when the horses were young, after which they grew so large that they must remain on permanently. Fortunately a little girl who had directed them where to place the team, observed them working on a wrong theory, came to their relief and by simply reversing the collar removed it with ease. Theoretically dairying is a highly remunerative business and if all milch cows were ideal milk producers giving upwards of a barrel of milk daily the problem of the price would be an important consideration when the price is 80 cents to a dollar for forty quarts. One of the practical problems is to get up early mornings, do the necessary chores, get a team ready to start breaking new ground during hot days when the thermometer registers 90 degrees and above, striking stones, here, and stumps and roots, turning over a bumble-bees' or yellow-jackets' nest, unable to go either ahead or backward is intensely practical.

The theory of spraying trees with Bordeaux mixture, or lime sulphur and salt which must be boiled and put on hot is a dreaded task, and practically about as disagreeable as weeding an onion patch, or hauling and spreading manure in August.

Theoretically there is both pleasure and profit in bee keeping, but when queens are to be introduced, colonies divided, swarms hived, or honey removed, working in the heat of summer, wearing a veil while working among a lot of enraged bees, bent on business, trying to find places to insert their poisonous darts, it is neither as pleasant nor as profitable as writers would have us believe. We profit, however, and enjoy privileges and blessings that are due to theory and carried to practical success. A few of men noted the names of Columbus, Newton, Harvey, Watt, Howe, Harse, Pasteur, Westinghouse, are familiar to everyone, each one of those named worked out a theory that are of vast practical utility. In horticultural lines Luther Burbank, working out theories that prove practically of much value, and among the latest that of having produced a spineless cactus plant, which will thrive in rainless districts and afford food for animals where none can live now.

Paper by Thomas Rakestraw, Kennett Square, Pa.

MUSHROOM CULTURE.

The word mushroom is used by some as a general term for a large number of the higher fungi, which would include what is generally known as mushrooms, toadstools and puff-balls. The lower fungi would include rusts, smut, molds and mildews. Others use the word in reference to the common edible kinds in cultivation, and those that grow in the fields. Still others apply it to all the

edible species, and use toadstool in reference to the poisonous kinds. Webster says a toadstool is a mushroom. It will be seen that it is difficult to give a satisfactory definition, or to tell just where mushrooms commence or where they end. There are hundreds of varieties, many of them are edible and some are poisonous. In a horticultural sense, when we speak of mushrooms, we mean those in cultivation in this country and Europe, and those that grow naturally in the fields. This variety botanists have named *Agaricus Campestris*. The best known of the other genera are the *Coprinus*, *Lepiota*, and the *Amanita*, all of which have several edible species. Among the *Amanitas* are a number of poisonous kinds, of which the principal one is the *Amanita Phalloides* which is responsible for most of the deaths caused from eating mushrooms. It is generally found in the woods or near them.

The common mushroom is umbrella shaped, and the principal parts are the stem and the cap, which has gills underneath. At first these gills are white in color, a little later they are pink, and when the mushroom becomes still older and is ripe, they are of a blackish color. This is due to the ripening of an immense number of seeds or spores on the surface of the gills. It is supposed that these seeds or spores of the mushroom, when growing in the fields, are scattered by the wind or are distributed in other ways, and when they fall in congenial places, they germinate and produce the spawn which botanists have named mycelium. A person would naturally suppose that we would be able to take the mushroom spores and raise other mushrooms from it, but so far, no one has been able to do this, though there has been a great deal of experimenting along this line. But that the spawn is produced from the spores in Nature's way, however, is almost certain.

In the growing of mushrooms, the spawn itself is cultured and divided, and the new spawn is grown from the parent stock. The spawn is the true mushroom plant, and what we call mushrooms is the fruit. The spawn or mycelium has the appearance of a network of delicate white threads which grow through the soil or manure or the beds that have been prepared for it. Under favorable circumstances, and having the right temperature, moisture, and proper nourishment, the plant develops and in due course of time produces fruit.

Cultured or made spawn is an article of commerce and is manufactured in large quantities. That used in this country is made mostly in England and comes in what are called bricks. These bricks are about 9 inches long, 5 inches wide, 1 and $\frac{1}{2}$ inches thick, and weight about one pound. They are made of horse manure, cow manure and soil mixed together. After the bricks are made into shape, and are dried sufficiently, a small piece of spawn is placed in the center of each and the hole is closed up with a piece of the same material of which the brick is made. A bed of horse manure is prepared as for a hot bed. The bricks are piled upon it, but not too closely, and are then covered up. The moisture and heat from the manure will start the spawn to grow or run through the bricks. When this process has gone far enough, the bricks are allowed to cool off and dry, and further growth is stopped until they are to be used for producing a crop.

The manufacture of spawn is regraded as a very particular business requiring great skill and care. The French make and sell what is called flake spawn but it is not much used in this country. It is light, and comes in large strawy flakes. There is an American spawn of very recent introduction which is now used to some extent. It seems likely that it may come into general use as excellent results were obtained from it during the past season. This American spawn is made by taking pieces of the mushroom itself for propagating purposes, and it is claimed that the manufacturers can by this method produce and propagate any particular strain and that by selecting fine specimens for the purpose, they can make a spawn that will produce mushrooms like the parent stock.

Virgin spawn is that which is obtained from the fields or manure heaps, and is supposed to come from the spores. It is more vigorous than made spawn, and manufacturers endeavor to get it to use in making the spawn which they sell.

Mushrooms grow in all temperate climates in the world but they will not grow where it is either too cold or too hot. They may be grown in houses built for their cultivation, in house cellars, barn cellars, under the carnation benches in greenhouses, in caves or in any other place where the temperature and moisture can be controlled and kept about uniform and at the proper degree.

A common plan for houses is about as follows: 100 feet long, 18 feet wide and 6 feet to the eaves and with an even span roof. This will allow three beds, 3 and $\frac{1}{2}$ feet wide on each side, and four beds 7 feet wide in the center, and two alleys, 2 feet wide, to give room for picking the crop, putting in the manure and taking it out, after the cropping season is over. The entire bed surface of such a house would be 4,900 square feet, and would require about 100 tons of manure costing \$1.25 per ton exclusive of freight and 1,200 pounds of spawn costing 6 cents a pound. Mushroom houses generally have a cellar of 2 or 3 feet dug out, and the dirt is also banked up around the house on the outside. This tends to make it easier to keep an even temperature which is a very important consideration.

Horse manure from the cities is the kind generally used. It should be free from any other matter and not too strawy. It is put in ricks as hauled from the car and earth is mixed with it as it is piled—usually in the proportion of about 5 cart-loads of earth to 20 tons of manure. While the manure is in preparation, the rick is turned at three or four different times until it is considered in the proper condition. It is then put in the beds in the mushroom house to the depth of about 8 inches and packed quite firm. The temperature of the manure will rise to 100 degrees or more, but will soon fall. Growers usually spawn the beds when it has dropped to about 90 degrees. The spawning process consists in cutting up the bricks in about 8 pieces and putting them 2 inches deep in the manure and 10 inches apart. In a week or 10 days the beds are covered with about 1 and $\frac{1}{2}$ inches of earth—rich sod—with the heavier grassy parts of the sod thrown out is considered the best. It should be moderately moist, but not wet, and it should be made firm. After this is done, a temperature of about 60 degrees is desirable.

The length of time until signs of mushrooms appear on the surface varies, as they are sometimes much slower than others, but

usually, in about 5 or 6 weeks there will be an appearance like white mold on the surface, and in a short time after this, the mushrooms will appear. During the interval of time from spawning until the crop comes, the anxious grower will be examining the beds to see if the spawn is running freely and filling the entire mass of manure with a complete network of small white veins. If it is doing this, he is pleased with the prospect. At the joints in this network of spawn or mycelium little rounded enlargements are formed. These are called buttons, and as they grow and come up to the surface they are supported by a stem. They very soon push up through the manure and dirt and we have the mushroom. It seems quite a while after the house is spawned until there is any crop, but when they once get to coming through the soil, they develop very rapidly. After the mushroom house is producing, the temperature should be kept as near 55 degrees as possible. A high temperature brings the crop on too rapidly and exhausts the beds. The mushrooms will be weak, of poor quality and will have objectionably long stems.

Much care must be observed in the watering. It is the custom to moisten the beds when the first signs of mushrooms appear and afterwards whenever the soil shows signs of dryness. They should never be flooded, simply enough water being applied to keep the earth moist but not enough to get very dry before watering. Heavy drenching is considered injurious to young mushrooms. Hence the necessity of watering sparingly and often, but not more often than necessary to maintain a moderate moistness in the soil.

After the cropping season begins the mushrooms develop very rapidly and it is only a few days after they begin to come through the ground until they are ready to pick. They must be gathered every day. They must not be cut off, but pulled. In preparing them for market, the roots are cut off, and then they are firmly packed, with the caps up, in four pound baskets made especially for the purpose. Those grown in this section are sold mostly in New York and Philadelphia markets. Prices vary in different years and at different times in the year. Early in the fall they often bring as much as 75 cents to \$1.00 a pound, and late in the spring, before the weather gets hot, they will often bring the same price. But the bulk of the crop, however, is gathered between these extreme seasons, and brings to the grower prices varying from 25 to 60 cents a pound:

After the crop is over the houses are cleaned out. The refuse makes a good top dressing for any soil. The houses should be thoroughly purified and everything about the house should be white-washed in order to destroy any objectionable fungi that may be about the place, and which might make trouble in the next crop.

The growing of mushrooms has increased very much during the last few years. Ten years ago there were perhaps not one-fourth as many grown in this section as there are now, and then the price was sometimes as low as 17 and 18 cents a pound. This shows there is an increasing demand and that people are finding out that mushrooms are good to eat. Chester and Delaware counties are important factors in the supply of mushrooms to the eastern cities and are no doubt the greatest mushroom producing sections in this country. There are several growers who use as much as 500 tons of

manure annually and others who use more than this. It is estimated that there is used in the aggregate as much as 10,000 tons annually in these two counties.

There are a great many mushrooms grown in England, many more there than here. The French have made a specialty of growing them in what are called "The Caves" at Paris. These underground caves or tunnels are abandoned quarries from which building stones have been taken. They are from 40 to 125 feet under ground and vary in height and width according to the size of the vein of stone quarried. A few of them are entered horizontally, but most of them are entered from a perpendicular shaft at the top. Workmen ascend and descend by means of a ladder. The manure is prepared above ground and when ready to be used, it is thrown down the hole. The refuse is taken up by means of a windlass.

Their methods are quite different from the English or American. They make no beds like ours. The manure is made up in ridges. There ridges are 18 inches wide at the bottom, 6 inches wide at the top and about 18 inches high. Alleys a foot wide are left between the ridges. They are spawned and earthened much the same as the Americans do, only they use the flake spawn. They are considered expert growers and many of them are engaged extensively in the business—some using as much as 3,000 tons of manure annually. The mushrooms are sold at auction in Paris, but at a lower price than in this country. For a few years there seemed to be a desire here to imitate the French in their methods, but about all have abandoned them.

Thus far it would seem as if it was all smooth sailing for the mushroom grower but such is not the case. In the early spring maggots are likely to attack them, and they are liable to a disease called black spot. They are also subject to slugs which eat holes in them. Fogging off is a common trouble. It consists in the softening, shriveling and perishing of the young mushrooms, which assume a brownish color. It is considered a root trouble and may be produced by too much watering, a drip in the bed, disturbing the mycelium when picking the mushrooms or any other cause that disturbs the mycelium will cause the young mushrooms to fog off.

There is a great deal of uncertainty connected with their production. In fact, there seems to be no certainty. Beds spawned the same day with the same kind of spawn may give very different results. The beds may be alike in every particular and the grower will not be able to tell why the one failed and the other was a success. The learner is just about as likely to have a heavy crop as the veteran of 20 years experience. An old barn cellar or house cellar, an abandoned silo or ice-house may produce an exceptionally heavy crop, while the mushroom house, built after the most approved pattern, may prove a complete failure. Indeed, there is so much uncertainty, that old growers are cautious about giving advice, and will say they know nothing about the growing of mushrooms. If any one is fond of uncertainty, and wishes to engage in a first class lottery, let him go into mushroom growing.

It is a general opinion that the cause of many failures is in the spawn. It may be, that in its manufacture, it has been overheated, or, on ship board it has possibly been too close to the boiler, and the moisture and heat have started it to grow, either of which would

damage it seriously. Perhaps we sometimes get old spawn, which is considered very objectionable. It is very difficult to tell good spawn—spawn that will produce desirable results with any degree of certainty, and but few of the men who grow mushrooms are able to separate the good from the bad. It seems that this should certainly be a part of the business that every grower might understand. The manure, spawn and labor are all expensive, and there should be some security that the spawn is fresh and strong, and that it only needs the warmth, moisture and plant food properly applied, to reward the grower for his vigilance and labor.

ARGUMENTS FOR AND AGAINST THE FUMIGATION OF ALL KINDS OF NURSERY STOCK LIABLE TO INFESTATION BY SAN JOSE SCALE.

Address by Prof. H. A. Surface, Economic Zoologist of Pennsylvania.

By fumigation we mean subjecting an object to exposure to deadly fumes when confined within a closed space. The vital range between a tree and an insect attacking the same is so wide that the fumes may be made strong enough to kill the pest without injuring the tree or plant. It is found by many experiments that fumigation is the only effective means of killing the San José Scale and certain other destructive pests when found upon nursery stock, and thus preventing their spread to orchards in which this stock is to be planted.

One may fumigate with carbon bisulphide or any other material that will produce deadly fumes, but the best material that is now known is hydrocyanic acid gas, generated by dropping cyanide of potassium into sulphuric acid dilute with water. The requirements in the State of Pennsylvania, and in fact in most States of the Union, are that the cyanide must be 98 per cent. pure, the sulphuric acid must be 1.83 per cent. specific gravity, and the following amount must be used for each one hundred cubic feet of enclosed space:

One oz. (by weight) of cyanide of potassium.

Two oz. (by measure) of sulphuric acid.

Four oz. of water.

The sulphuric acid is to be poured into the water in an earthen or wooden vessel, and the cyanide is to be dropped in suddenly. Then the operator must escape from the room just as quickly as possible. It is best to have the proper amounts computed according to the size of the room, using the above formula for each one hundred cubic feet, and have them weighed and measured, and the cyanide placed in a small paper bag ready to drop in at once and permit the immediate escape of the operator from the fumes, which are most deadly.

It has been found by actual experimentation that prolonged exposure of a low grade of material, or to fumes from a less quantity of material, is more likely to injure the plants, without being so

sure of killing the scale, as is exposure to the fumes of a sufficient amount for a shorter time. That is to say, short exposure (about forty minutes) with the above formula is proven to be more injurious to the insects and less injurious to the plants, than longer exposure with less material, or with weaker material.

It is necessary (1) that the cubic contents of the room be accurately determined; (2) that the room be air-tight or gas-tight; (3) that the cyanide of potassium be 98 per cent. pure; (4) that the sulphuric acid be as strong as 1.83 per cent.; (5) that a sufficient amount be used to preserve this formula according to each one hundred cubic feet of space (6) that the fumigating house be not over packed with tightly crowded plants; (7) that the plants be not wet during the time of fumigation; (8) that the fumigation continue for at least forty minutes; (9) that the gas be administered from below rather than from above; (10) that the fumigating house be air-tight and kept tightly closed during the entire period of fumigation, and (11) that the plants be practically dormant. It also is important that the room be so constructed that it can be quickly ventilated after fumigation is finished, and that this ventilation be done rapidly, according to directions. If the trees be covered with mud or be encased in any covering that the gas does not readily penetrate, those scales that are covered will not be killed. If the roots of the trees be packed in damp moss or other material at the time of fumigation, there is especial danger of injury to them.

With these facts in mind, let us first say why all nursery stock in this State of kinds not liable to attack by the San José Scale should be fumigated before being sold, shipped or transplanted. It should be said that by the expression of "kinds not liable to infestation by the San José Scale" we mean conifers, strawberry plants, bulbs and tubers, herbaceous perennials and bedding plants.

1. It is acknowledged by all practical entomologists who have made a careful study and proper tests in this subject that fumigation is effective in killing the scale when properly done. Much of importance depends upon the expression "when properly done."

2. Fumigation does not injure any kind of nursery stock that is attacked by the San José Scale, when properly fumigated. In the early fall and late spring while the trees are not dormant there may be slight injury, but this proven to be insignificant. A fruit grower and nurserymen in this State recently told the writer that he had fumigated apple trees in the spring after they had started to grow and when the new shoots were from three to six inches long. He used the above formula and transplanted the trees in his own orchard. The growth was not checked, the trees were not injured, and the scales were killed.

3. Another argument for fumigation is that it prevents the dissemination of scale insects and many other pests from any and all nurseries, whether the inspector has found it in them or not. No inspector can possibly find all the scale insects in any nursery or all of the trees that have only a few of these pests upon them, but the gas when properly applied can find nearly if not quite all.

4. Many States are requiring fumigation of all nursery stock. No less than eight states have this requirement. We should not require it for our State merely because others do the same, but the

best fruit-growing states of America and also Canada would not require universal fumigation if the experts and scientific persons in those States did not find it best.

5. No other treatment of any nursery stock which is suspected of being infested is known to be as effective in killing the scale or as safe to the trees. Since this is true, fumigation—the best method—should be ours.

6. A further and very strong argument for fumigation of all nursery stock, especially of all fruit trees, is that the fruit growers want it. They find that the pest is carried into their regions upon nursery stock that has not been properly treated, and generally not treated at all. It is very important that its dissemination by this means be entirely checked. The best authorities in our country have nothing better to offer than universal fumigation.

Arguments Against Fumigation.

With this, as with every question, that are two sides. Let us try to take as honest a view of the opposing side as we have taken of that just discussed. For certain reasons the nurserymen are justified in opposing fumigation as performed by many persons.

1. Fumigation may not be effective. If it be not effective, why should we require it? It will be ineffective when any one or more of the conditions named in the early part of this article are missing or improper. By "ineffective" we mean that the scale will not be killed. When fumigated for too short time, or by poor material, or when the trees are so wet that they are covered by a film of water, when the house is poorly constructed and leaks gas, when overpacked, when insufficient material is used, etc., the scale will not be killed and the expense and time and trouble of fumigation will be for nothing.

2. Fumigation may be made to injure plants, and it does injure them when improperly done. This may come from too long exposure, using too much material, fumigating plants when not in dormant condition, fumigating them when the roots are packed in damp packing material, fumigating them in a room that is not adapted to ventilation, for example, a box car, fumigating at a very high temperature or while the room is very warm, and also fumigating varieties such as conifers and greenhouse plants that are too delicate to stand full strength. It should be said that the latter may be fumigated when necessary by reducing the strength, as should be done for peach when quite dormant or the wood is not hardened. All fruit trees when dormant will stand much more than the formula above indicated.

3. Fumigation is troublesome and expensive to nurserymen. When a large firm is rushing its orders in the spring, it is as busy as any extensive farmer at haymaking time, especially if there should be prolonged rains at this time, it would be quite a hindrance to their work to impose the necessity of fumigation. The only thing for them to do would be to permit each load of trees to stand under shelter until the bark is dry. Standing over night should be sufficient for them to dry enough to fumigate in the morning.

4. Fumigation demands the attention of a very careful and reliable man during the "harvest" season when the nurserymen are busiest, and to make such demand upon nurserymen must have most serious justification.

5. Some nurseries are not in the infested regions and do not have San José Scale. It is a question if nurseries that are known to be clean should be compelled to fumigate. On the other hand scale has been spread on stock that was thought to be clean. This is a common case of putting similar requirements on all persons in order to permit no guilty one to escape.

6. Some nurserymen do not want fumigation. They have as much liberty to say that they do not want fumigation as the fruit growers have to say they want it done. Whether they have as much justice in this statement depends upon conditions. If a man thinks he has no San José Scale and should not fumigate he may disseminate it, but if he knows he has none, no good will be done by the fumigation, and yet when properly done no harm will come from it.

On the whole, our observations, studies and experience lead us to say that universal fumigation is the only safeguard for fruit growers.

Adjourned.

Afternoon Session.

Before taking up the regular programme the following was offered by Prof. Watts.

Resolved, That the Pennsylvania State Horticultural Association hereby records its appreciation of the recognition accorded to the agricultural and horticultural interests of the State by the last Legislature in the appropriation of \$100,000 to begin the erection at the Pennsylvania State College of an agricultural building, with the proviso that the total cost shall not exceed \$250,000.

Resolved, That we request and urge the coming Legislature to provide for the immediate completion of the building by the appropriation of the remaining \$150,000, in order that all branches of agricultural education at the State College may be as well housed as is the dairy work in the portion of the building now completed.

Resolved, That this organization appreciates the work done for agricultural education in the past under very unfavorable conditions by the Pennsylvania State College and that it requests from the next Legislature a liberal appropriation for the maintenance of the various agricultural courses, in order that the equipment already provided may be utilized to the fullest possible extent.

Resolved, That in view of the importance of scientific investigation to the development of the horticultural interests of the State, and of the fact that in the past scarcely any State aid has been given to the Agricultural Experiment Station, the Horticultural Association is heartily in favor of a liberal appropriation by the State for the maintenance and enlargement of the current work of the Station, particularly along the line of a study of the insect and fungous enemies of the horticulturist.

Resolved, That the secretary be instructed to send a copy of these resolutions to the secretary of the Allied Agricultural Organizations, and that the Legislative Committee be instructed to co-operate with that organization in securing the desired legislation.

MR. HIESTER.—As a trustee of the College and Station, I would like to make a brief explanation. The last Legislature made an appropriation of \$100,000 for an agricultural building, but has made no provision for maintenance. Money must also be provided for Dean's salary and a residence for him, and nothing has been provided for horticulture. I hope every member of this association will use his influence to obtain some recognition for horticulture in addition to agriculture.

On motion resolutions were unanimously adopted.

Report of Committee on Legislation.

The following was submitted by Mr. Hiester.

Section 1. We would recommend a modification of the nursery inspection act to make it include private premises, and inspection for San José Scale and other pests and diseases in orchards and on public and private grounds. This would be done by the Secretary of Agriculture through the Economic Zoologist by such means as shall be considered most effective in bringing about the desired results, and would recommend an appropriation of \$30,000 annually for carrying out this work.

MR. STOUT.—This is an important section and should be considered very carefully. Whether this work should be undertaken by the State is a problem. The San José Scale is a very difficult insect to control.

MR. HIESTER.—The Nurserymen's Association which has recently held a meeting in this city, has considered this question very carefully. They are required to keep their nurseries free from San José Scale, and think that fruit grower's should do the same, so long as premises in proximity to the nurseries are infested their efforts to keep nursery stock clean, are in a measure futile. We believe it is to the interest of all to try to suppress the scale for the public good.

MR. CHASE.—As I understand it, it makes it the duty of the State to protect the citizen against his careless neighbor.

The section was adopted as read.

Section 2. "We also recommend the establishment of a Division of Horticulture in the Department of Agriculture, to be administered by a Commissioner, who shall be a practical horticulturist of experience, and who shall be assisted by a clerk and stenographer, and would recommend an appropriation by the Legislature of \$10,000 annually, or so much as may be necessary for payment of salaries and other expenses of this Department.

PROF. BUTZ—A bill of this tenor was passed by the last Legislature and vetoed by the Governor on account of some defect or technicality.

On motion the section was approved.

The following paper was read by John G. Rush, West Willow, Pa.:

THE PERSIAN WALNUT.

It is not my purpose at this time to give you a lengthy and descriptive history of the Persian Walnut from its early introduction

into this country, but to be as brief and practical as possible. It is a well-known fact that it is grown in almost every State in the Union. It is also well for us to know in which of the States it finds a natural adaptation to its best development.

The Black Walnut is a good leader where it succeeds and the Persian Walnut is a close follower, as it belongs to the same genus. I do not know anywhere on the Atlantic coast, or in the interior, that the Persian Walnut is grown for commercial purposes, but on the Pacific coast they are grown very extensively and find a ready market in the Atlantic coast cities.

It is not altogether just that California and some foreign countries should have the exclusive privilege to this market, when it is possible that the Persian Walnut can be as successfully grown here as elsewhere. Now right hear who is to blame? Adam, speak out, as you did once before, well, the blame is right here, and let him whom it hits take it.

Up to this time all Persian Walnut trees have been sold by nurserymen as seedlings, and as a result we have a conglomeration of all types and shades of Persians. The Persian Walnut may be successfully grown in sections where no other trees grow of the same genus, otherwise you are bound to have a mixture which is very annoying to the nut grower.

I do not wish to be understood that grafting alone will remedy the trouble that I see at home, in my own village, where the Persian has been very successfully grafted on the Black Walnut. If proper selection of the variety or kinds had been made, one might be proud of the result, but the grafted tree is no better than the seedling.

There are some very good seedling Persians, but they are few and far between. I have in my yard on the farm a Persian than which I saw nothing more productive last summer when on a visit to Santa Barbara, Cal. At ten years of age I had two bushels and increased to three bushels last fall. I have another tree the same age only 40 feet away, that had about three quarts. Such examples as this makes one think of the subject of Nature Study.

As I had access to these trees I watched closely to see why the difference in productiveness. The three quart tree had a profusion of staminate bloom, but dropped too soon to fertilize the pistilates, hence the failure. The three bushel tree is a little later in bloom, but both staminate and pistilate developed together until well fertilized, showing there is a mechanical difference in trees and plants as well as in the animal kingdom.

Now the question arose in my mind, have I the only "pebble on the beach?" So I made it my special object to go in search of prolific Persians. I drove eastward about twenty miles in a very populous section of Lancaster county, and found nothing worthy of mention, but a few mongrels. A few days afterwards I took a western drive in the neighborhood of the former Conestoga nurseries, feeling sure, that our departed friend, Caspar Hiller might have a Persian to his memory. I found two large trees here, but not prolific enough to be any value. I stated at this place the object of my pursuit. I was directed about one-fourth mile farther westward to a somewhat secluded place, where I found two large trees that were as prolific as my own. I still continued my search for more

Persians and at last I came upon another tree that was a perfect beauty for productiveness. Having a long and intimate acquaintance with the owner I asked the question, why this tree so prolific and the other three trees so shy? As no reason could be given, the verdict was "only by chance." With this investigation I found that only about four per cent. of all the Persian Walnut trees I saw are worthy of propagation.

Several years ago I tried to raise seedlings from my trees, but discovered very soon in the early life of these young trees that they were tainted with foreign blood. The leaves of these little Persians were serrated or tooth edged, and were nine and eleven in number, and on rubbing the leaves in my hand they would throw off a Black Walnut odor, whereas the parent shows five and seven leaflets with a smooth edge and on rubbing through the hand would transmit a very sweet odor, so by propagating with seed we only perpetuate the specie and not the variety. The only remedy then, is to resort to grafting or breeding of prolific trees to insure success.

The art of grafting and budding the Persian Walnut in this locality is somewhat unknown to our enterprising propagaters. It is, however, very successfully performed in other localities where special efforts are made in that direction.

In 1895 I bought a small order of trees from New Jersey, among them were three Japan Walnut and one Persian, the variety catalogued as the Kahasi, noted for its early and prolific bearing. Last summer I found to my surprise this Kahasi well loaded with pistillate bloom sparkling in the sunlight like diamonds, and no staminate in sight, so of course something had to be done to assist the tree to develop its fruit. I went on my farm not far away and got about a dozen and a half of good staminate twigs, and put them in a dozen bottles with water in order to keep fresh. These bottles were then hung promiscuously over the tree in order that the pollen might have free access to the proper fertilization of the pistilates. Now the result; last fall I managed to harvest 200 well developed meaty nuts for the little assistance rendered in Nature Study.

When the United States Department of Agriculture introduced nut culture in the United States no mention was made of the Persian Walnut on the Atlantic coast, all information on the subject having come from the Pacific coast. If we exert ourselves as they do, I am sure we can attain the same results, and have the benefits of the Atlantic coast market with very little expense. I look upon the introduction of the Japan Walnut the next thing to insult. As soon as I had the first fruit, I introduced the American axe (not the missionary) to its roots and converted them to fire wood. Even our American Butternut is far superior and the Black Walnut still more so. The Persian Walnut tree is very beautiful with its clean white bark, shaded with green, glassy leaves during summer time, and when autumn approaches it is a pleasure to see the hull cracking open showing what is inside, smiling all the while until gathering time. Believe me, there is nothing that I delight more than to shake a well filled Persian of its nuts, and how they rattle through the limbs and leaves, roll and tumble over the green sod in merry laughter, waiting to be gathered by the husbandman for future use.

The tree is proof against many ailments, such as borers, yellows,

blight, caterpillars and San José Scale. The nut is also proof against the pernicious Chestnut Weevil, and can be used in various ways in the household for daily food or luxury.

It can be kept for two years without any injury to its good qualities with proper care and attention in storage.

The pleasure I have derived from this experimental work I feel myself compensated with the close communion I had with nature's handiwork, and feel to continue in its further researches to greater developments. I also keep in connection an exhibition on back porch, a table well filled with all kinds of native nuts and how they grow, for the benefit of school children, friends and neighbors, and above all myself.

In the last fiscal year Grenoble shipped to this country \$450,320 worth of walnuts. This should not be the case. We should raise our own walnuts, both for the goodness of the fruit and the value of the wood. Practically, the land over, the wild walnut tree has disappeared, and yet, with the demonstrated profit there is in the tree, people cannot be induced to plant it. It may be it is a slow grower, but every generation should think of its successors and plant for them.

MR. STOUT.—Some twenty years ago I planted some English Walnuts, and they have frozen back every winter. They are only 8 or 10 feet high at this time and have never borne any nuts.

MR. CHASE.—In Burlington County, N. J., they are able to grow them. Some varieties are more hardy and prolific than others.

MR. RAKESTRAW.—I think the hardiness of the English Walnut depends largely upon elevation. On low lands they are liable to injury, and on elevated lands they are seldom injured at all.

MR. RUSH.—This may be owing more to variety than locality.

The following paper was read by Mr. Wm. F. McSparran, Furness, Pa.

THE CONSERVATION OF MOISTURE IN THE ORCHARD.

The best method of conserving soil moisture must remain largely theoretical for there are so many circumstances of soil and other conditions that no rule may be laid down as the best for all to follow.

The orchardist as well as the general farmer, if he stops to think about the matter, must realize the prime importance of soil moisture in the growth of any of our farm crops. But it is no uncommon observation of the student of agricultural economy that in a great many very important things the common run of farmers do not stop to think at all. This remark of course does not apply with any particular force to such past-masters of soil tillage as I have the pleasure of here addressing, and I trust I may be pardoned for here turning aside to say that it is very common in agricultural teaching that it is the fellow who does not need it instead of the multitude that does need it, who gets it.

We, therefore, all know of the importance of soil-moisture to the horticulturist, but I am not so sure that we are all so fully cognizant of the great necessity of our using every reasonable means for holding in the soil, conserving the earth supply of moisture, so it may to the utmost be used by our growing crops in garden, field and orchard. I will doubtless be held as radical in making the statement that our crops, and those of the orchard especially, are almost entirely dependent upon the supply of stored soil-moisture, and not upon that gathered from the rain fall during the season of the crop's growing.

If I am correct in this claim the importance of the most careful conservation of the moisture supply is paramount. If I am only half right and the good crop's success depends upon the current rains partly and partly upon the earth supply, the importance of the latter is not lessened in its relation to this crop. It is obvious the orchard must have the earth moisture to draw upon. It is as plain that without the intervening care of the orchardist the atmosphere draws upon this moisture to the loss of the crop and its owner; hence we come to say how shall we best conserve the soil supply so it be not wasted into the thirsty atmosphere?

The first theory was that we shall arrest the loss by creating a non-conducting object between the moisture and the air. We should mulch. We should break the connection between the two and allow the moisture to only reach the atmosphere through the organisms of our growing crops or trees. We find this can be very effectually done by frequent cultivation of the soil and men have come to talk wisely and some of them incessantly of the "dust mulch."

But the time has come when other men are to be found who question the wisdom or at least the economy of the "dust mulch," for the young growing, unshading orchard. We have discovered the soil bacterium and the more we study and learn about him the more we are inclined to modify many old ideas that were one time good enough. It appears now to be well established that our soil fertility largely depends upon the bacterial occupancy of it. The wise soil worker, therefore, if that be true, will use every economical means to maintain in his land conditions favorable to the existence and multiplication of these now-found friendly organisms; and it has become a matter of considerable doubt whether we are encouraging them when we are subjecting our unoccupied, unshaded soil to the frequent stirrings necessary to keep an effective dust mulch through the long season of the summer heat.

This is not intended as an argument that we shall stop the cultivated and allow the crust to form on the surface of the bare ground, for fear we unsettled the operations of the bacteria. By no means. The dust mulch saves more in its moisture conservation than is lost from its bacterial disturbance; but the better plan seems to be to have the ground occupied by some crop that shall at once serve almost all the good offices of a mulch, create favorable conditions for soil bacteria, and as an incident and consequence of its growth really add to the sum of the land's fertility. It is true that these crops use moisture in proportion to the success of their growth, but no maker of figures has yet come forward to tell us how much

more moisture they use than is wasted from bare land even when covered by the most orthodox dust mulch. The latter cannot possibly add anything to the fertility store of the land, it can only arrest the action of capillarity; the former can do as much while further enriching the soil actively and potentially and contributing that quality of humus to the land, so more moisture will be absorbed and held for plant use.

It is true that in the discussion of such a topic as this we cannot get beyond the realm of theory and speculation, for climatic and soil conditions are as changeable and variable as orchards and fields are numerous; but it is my deliberate opinion that the most logical methods of conserving moisture for the orchard, is by the agency of a growing crop, to be finally worked into the soil.

MR. HIESTER.—What shall I sow in stony mountain land in order to get more humus into the soil?

MR. McSPARRAN.—I would first try to ascertain whether the soil needs phosphoric acid and potash. If deficient in these mineral elements I would supply them and sow about a bushel of cow peas per acre. If the ground were not reasonably fertile I would experiment at least with artificial bacterial inoculation.

The peas should not be sown until the ground is warm—say the latter part of May or early June. In the fall this crop should be plowed under or disked into the soil and the land sown to sand vetch and rye to, in turn, be plowed under the following spring.

Collecting a large amount of humus on stony, hilly or mountainous land is a difficult matter and I think on such land devoted to fruit culture, my prescription might profitably be continued in use indefinitely.

DR. MAYER.—What variety of peas would you plant?

MR. McSPARRAN.—Any of the ordinary vining kinds. There are endless names for them. The whip-poor-will is usually an erect grower, but makes a heavy growth. New Era and Red Ripper are good trailing kinds. I have had good crops from sowing mixed varieties the seed of which can usually be bought somewhat cheaper than pure seed. Unless bacteria are present in the soil artificial inoculation is desirable, as only by these agents it is supposed legumes can get, use, and store atmospheric nitrogen.

Mr. Peters of special-committee on new fruits on exhibition submitted the following:

Mr. President: The Committee on New Fruits reports as follows:

There were 21 plates of new fruits, consisting of apples in the main; of these 21 plates, we found 11 plates to be varieties of known names, which probably were not known in the community in which they were raised, and we have placed the names on the card on each plate.

We found no new fruits that were of special merit, or worthy of mention, when compared with the vast number of excellent varieties we have at this time. One jar of plums, however, exceeded anything else we have seen in canned plums; it is a native gage of medium size, and of most delicious flavor; having retained almost all its sweetness, although canned with the pits in the fruit.

If in order, we would recommend that in future exhibits of new fruits, 5 specimens of the same kind be placed on every plate, and that these specimens be nearly perfect.

Respectfully submitted by your committee.

EARL PETERS,
JOHN F. BOYER,
R. L. MARLATT,
Committee.

The chair announced that owing to business engagement at the Executive Chamber, Governor Pennypacker would be unable to be present at our meeting.

Mr. Black (New Jersey), expressed his pleasure and gratification in being able to attend our meeting, and extended a cordial invitation to the Society to send delegates to their next annual meeting. Every courtesy would be extended by their Society. He expressed the hope also that a fraternal spirit be perpetuated between our organizations.

Mr. Reid (New Jersey), cordially endorsed the remarks of his fellow delegate, and hoped to have the pleasure of meeting with us again.

MR. CHASE.—I will be glad to refer this matter to the new President, Mr. Hiester, and hope that in the future this association will not only have closer and more cordial fraternal relations with the New Jersey Society, but will send delegates as requested.

QUESTION BOX.

(1) Is refuse chloride of lime from dyeing establishments of value as plant food?

DR. MAYER.—I would consider it injurious to the soil owing to the amount of chlorine present.

(2) Should the robin be protected?

MR. SNAVELY.—I do not believe in eradicating the robin, though I am satisfied he is doing more mischief than any other agency in disseminating San José Scale. He also destroys fruit, but I do not condemn him on that account. When too numerous he is a nuisance and should be held in check.

MR. BLACK, (N. J.)—For years I was a friend of the robin, but I am his enemy now. Much that has been said and written about him is sentiment, and not warranted by facts. In New Jersey he lives on our fruit, sometimes destroying it entirely. He may do better elsewhere, but with us he does far more harm than good.

MR. SNAVELY.—What is the legal status of the robin?

PROF. SURFACE.—According to our law any bird or animal may be killed by the owner of the farm or premises, when found destroying fruit or other property. Birds in the act of destroying fruit on trees or berry fields may be shot by the owner of the premises, just as deer may be killed when destroying field crops. If properly provided for the robin will not destroy berries or choice fruit. If they have access to mulberries they will eat them to the exclusion of other berries. I know several persons who have taken this course with satisfactory results.

DR. MAYER.—I have had considerable experience with the robin, and like my friend from New Jersey, was his friend for years. As a fruit grower, I consider him a nuisance. Have found that planting mulberries to keep him away from other fruit is a humbug.

MR. BLACK.—I do not like to disagree with a Professor, all through life I have been a friend of birds, but my experience is not the same as Mr. Powell's, the party referred to by Prof. Surface, my experience is that the robin will not eat mulberries or small fruit when larger can be had. New Jersey robins never eat small cherries when they can get Black Tartarians.

MR. SNAVELY.—I fully agree with my friend from New Jersey. On my premises robins always prefer the best.

PROF. SURFACE.—On State College campus we have robins by the hundred, just across the way is my strawberry patch, and I have never lost any berries by robins, when able to get other fruit.

The following was offered by Mr. Peters and adopted.

Resolved, That the State Horticultural Association of Pennsylvania in annual convention assembled, recommends to the State Legislature now in session, that all lands adjacent to any nursery in the State shall be inspected for a distance of one mile surrounding such nursery, and furthermore,

Resolved, That any and all nursery stock shipped, subject to San José Scale, shall be thoroughly fumigated with hydrocyanic acid gas before it is shipped.

The following was offered by Mr. Moon, and unanimously adopted:

“This committee reports that the State Horticultural Association is again called upon to record the loss of members by death.

We have been informed of the death of two of our members, viz: Daniel Smeych, of Lancaster, Pa., which occurred April 5, 1904, at the advanced age of 76 years. He was one of Lancasters well-known citizens who for many years was an attendant at our annual meetings, especially when held in his home city. He was an occasional exhibitor of his choice fruits, and although but seldom taking part in the discussions, he was an interested listener, and a loyal member of this association.

The death of Joseph W. Thomas, of King of Prussia, Montgomery county, removes from our midst one of our oldest and most useful members. We believe he was one of the organizers of this association. He was one of our most active and practical members. Of a kind and genial temperament, he had a warm welcome for all at our annual assemblies. He was one of the leading nurserymen of the State as well as one of the best informed horticulturists, and most successful fruit growers. He was always willing to contribute his share to inform and instruct those less fortunate in knowledge and experience. Until within a few years he was a regular attendant at our meetings.

We cannot but feel that we have lost a personal friend. His death, which has removed from our midst one of our ablest and best informed members occurred September 19, 1904, in the 73d year of his age.

Signed

J. MORRIS JONES,
WM. H. MOON,
JAS. KREWSON.

Mr. Chase, the retiring President, thanked the members of the association for their uniform kindness and courtesy during his incumbency, and declared the association adjourned.

END OF YEAR