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Proceedings at the Twenty-Fourth Annual Meeting

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*** START OF THE PROJECT GUTENBERG EBOOK NORTHERN NUT GROWERS ASSOCIATION
REPORT OF THE PROCEEDINGS AT THE TWENTY-FOURTH ANNUAL MEETING ***

DISCLAIMER

The articles published in the Annual Reports of the Northern Nut Growers Association are the findings and thoughts solely of the authors and are not to be construed as an endorsement by the Northern Nut Growers Association, its board of directors, or its members. No endorsement is intended for products mentioned, nor is criticism meant for products not mentioned. The laws and recommendations for pesticide application may have changed since the articles were written. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The discussion of specific nut tree cultivars and of specific techniques to grow nut trees that might have been successful in one area and at a particular time is not a guarantee that similar results will occur elsewhere.

**NORTHERN
NUT GROWERS ASSOCIATION**
INCORPORATED
Affiliated with
THE AMERICAN HORTICULTURAL SOCIETY
**REPORT
OF THE PROCEEDINGS AT THE
Twenty-fourth Annual Meeting**



DOWNINGTOWN, PA.
SEPTEMBER 11 and 12,
1933

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President. Frank H. Frey, Room 930, La Salle St. Station, Chicago, Ill.

Vice-President. Dr. G. A. Zimmerman, 32 South 13th St., Harrisburg, Pa.

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NORTHERN NUT GROWERS ASSOCIATION

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 Allen, Edward E., Hotel Ambassador, Cambridge, Mass.
 Allen, Philip, 178 Dorance St., Providence, R. I.
 Andrews, Miss Frances E., 245 Clifton Ave., Minneapolis, Minn.
 Anthony, A. B., Sterling, Illinois.

Ballock, J. S., 1559 Main Street, Springfield, Mass.
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 Bixby, Mrs. Willard G., 32 Grand Ave., Baldwin, N. Y.
 Bontz, Mrs. Geo. I., Route No. 2, Peoria, Illinois.
 * Bowditch, James H., 903 Tremont St., Boston, Mass.
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 Bradley, Homer, c/o Kellogg Farms, Rt. 1, Augusta, Mich.
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 Brown, Roy W., Spring Valley, Illinois.
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 Burgart H., c/o Mich. Nut Nursery, Rt. 2, Union City, Michigan.

Caha, William, Wahoo, Nebraska.
 Cannaday, Ward M., Home Bank Building, Toledo, Ohio.
 Cannaday, Dr. J. E., c/o Charleston Gen. Hosp., Charleston, West Virginia.
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 Collins, Joseph N., 335 W. 87th St., New York, N. Y.
 Cooley, Ralph B., Hotel Kimbal, Springfield, Mass.
 Crysedale, Stanley A., R. D. 5, Auburn, N. Y.
 Curtis, Elroy, Brookfield, Conn.

Deeben, Fred, Trevorton, Pennsylvania.
Deming, Dr. W. C., 31 Owen Street, Hartford, Conn.
* Drake, Prof. N. F., Fayetteville, Arkansas.

Elfgren, Ivan P., 11 Sheldon Place, Rutland, Vermont.
* Ellis, Zenas H., Fair Haven, Vermont.
Ellwanger, Mrs. W. D., 510 East Ave., Rochester, New York.
Ettari, Oscar A., 71 North Ave., New Rochelle, N. Y.

Ferris, Major Hiram B., P. O. Box 74, Spokane, Wash.
Fickes, W. R., Route 7, Wooster, Ohio.
Fontaine, Arthur, 21 Highland Ave., Ludlow, Mass.
Frey, Frank H., Room 930 La Salle St. Station, Chicago, Ill.

Gable, Jas. B., Jr., Stewartstown, Pennsylvania.
Gage, J. H., 107 Flatt Ave., Hamilton, Ontario, Canada.
Galbreath, R. S., Huntington, Indiana.
Garber, Hugh G., 75 Fulton St., New York City, N. Y.
Gellatly, J. U., Box 19, West Bank P. O., Gellatly, British Columbia.
Gerber, E. P., Route No. 1, Apple Creek, Ohio.
Graham, J. W., Walnut Orchard Farm, Ithaca, N. Y.
Greene, Mrs. Avice M., 2203 Ridge Rd., N. W., Washington, D. C.
Greene, Karl W., 2203 Ridge Rd., N. W., Washington, D. C.
Gribbel, Mrs. John, Box 31, Wyncote, Pennsylvania.

Hahn, Albert G., Rural Route No. 6, Bethesda, Md.
Hale, Richard W., 60 State Street, Boston, Mass.
Hammond, Julian T., 3rd, D.D.S., Newtown, Pa.
Harman-Brown, Miss Helen, Croton Falls, New York.
Harrington, F. O., Williamsburg, Iowa.
Hartzell, B. F., Shepardstown, West Virginia.
Healey, Scott, R. F. D. No. 219, Otsego, Mich.
Healy, Oliver T., c/o Michigan Nut Nursery, Rt. 2, Union City, Michigan.
Helmick, James H., Columbus Junction, Iowa.
Hershey, John W., Downington, Pennsylvania.
Hilliard, H. J., Sound View, Connecticut.
Holden, Frank H., 56 West 45th St., New York City, N. Y.
Hostetter, C. F., Bird-in-Hand, Pennsylvania.
Hostetter, L. K., Route No. 5, Lancaster, Pennsylvania.
* Huntington, A. M., 3 East 89th St., New York City, N. Y.
Hutchinson, Galen Otis, 691 Main Ave., Passaic, N. J.

Iowa State Horticultural Society, Des Moines, Iowa.
Isakson, Walter R., Route No. 1, Hobart, Indiana.

Jacob, C. M., Stockbridge, Mass.
Jacobs, Homer L., c/o Davey Tree Exp. Co., Kent, Ohio.
* Jaques, Lee W., 74 Waverly Place, Jersey City, N. J.
Jones Nurseries, J. F., Lancaster, Pennsylvania.

Kaan, Helen W., Wellesley, Mass.
Kaufman, M. M., Clarion, Pennsylvania.
Kellogg, Dr. J. H., 202 Manchester St., Battle Creek, Mich.
Kelly, Mortimer B., 21 West St., New York City.
Kendrick, Mrs. Jay G., 44 Main St., Shelburne Falls, Mass.
* Kinsan Arboretum, Lang Terrace, North Szechuan Rd., Shanghai, China.
Knox, Loy J., c/o First National Bank, Morrison, Ill.

Lamb, Gilbert D., Woolworth Bldg., New York, N. Y.
Lancaster, S. S., Jr., Rock Point, Maryland.
Leach, Will, Cornell Building, Scranton, Pa.
Lester, Henry, 35 Pintard Ave., New Rochelle, N. Y.
* Lewis, Clarence, 1000 Park Ave., New York City, N. Y.
Little, Norman B., Rocky Hill, Conn.
* Littlepage, Thos. P., Union Trust Bldg., Washington, D. C.

MacDaniels, L. H., c/o Cornell University, Ithaca, N. Y.
McIntyre, A. C., Dep't of Forestry, State College, Pa.

Mehring, Upton F., Keymar, Maryland.
Meyer, Dr. R. C. J., 1815 Third Ave., Moline, Ill.
Middleton, M. S., District Horticulturist, Vernon, British Columbia.
Miller, Herbert, Pinecrest Poultry Farms, Richfield, Pa.
Mitchell, Lennard H., 2219 California St., N. W., Washington, D. C.
* Montgomery, Robert H., 385 Madison Ave., New York City, N. Y.
* Morris, Dr. Robert T., R. F. D., Stamford, Connecticut.
Morton, Joy, Lisle, Illinois.
Neilson, Jas. A., c/o Michigan State College, East Lansing, Michigan.

New York State Agricultural Experiment Station, Geneva, N. Y.

Orner, George D., 751 Ridgewood Road, Maplewood, N. J.
Otto, Arnold G., 4150 Three Mile Drive, Detroit, Michigan.

Paden, Riley W., Rte. 2, Enon Valley, Penna.
Park, J. B., c/o Ohio State University, Columbus, Ohio.
Peters, E. S., 4241 Folsom Ave., St. Louis, Mo.
Pickhardt, Dr. O. C., 117 East 80th St., New York City, N. Y.
Porter, John J., 1199 The Terrace, Hagerstown, Md.
Pratt, Geo. D., Jr, Bridgewater, Connecticut.
Purnell, J. Eiger, Box 24, Salisbury, Maryland.
Putnam, Mrs. Ellen M., 129 Babson St., Mattapan, Mass.

Reed, C. A., Dept. of Agriculture, Washington, D. C.
Richardson, J. B., Lakeside, Washington.
* Rick, John, 438 Pennsylvania Square, Reading, Pa.
Riehl, Miss Amelia, Godfrey, Illinois.
Rowley, Dr. John C., 1046 Ashburn Ave., Hartford, Conn.
Russell, Newton H., 12 Burnett Ave., So. Hadley Falls, Mass.
Ryan, Henry E., Sunderland, Mass.

Sawyer, Dorothy C., c/o Living Tree Guild, 468 4th Ave., New York.
Sefton, Pennington, 94 Lake Ave., Auburn, N. Y.
Schlagenbusch Bros., Rt. 3, Fort Madison, Iowa.
Schlemmer, Claire D., Rt. 2, Fredericksburg, Virginia.
Schmidt, A. G., Nazareth, Pennsylvania.
Schuster, C. E., Horticulturist, Corvallis, Oregon.
Scott, Harry E., P. O. Box 191, Petersburg, N. Y.
Sherer, J. F., c/o C. T. Sherer Co., Worcester, Mass.
Slate, George L., State Agri. Exper. Station, Geneva, N. Y.
Smith, Dr. J. Russell, Swarthmore, Pennsylvania.
Smith, Leon C., 60 Day Ave., Westfield, Mass.

Snyder, D. C., Center Point, Iowa.
Spence, Howard, The Red House, Ainsdale, near Southport, England.
Spencer, Mrs. May R., 275 West Decatur St., Decatur, Ill.
Stark Bros., Nurseries, Louisiana, Missouri.
Steffee, Jno. G., 317 6th Ave., New York City, N. Y.
Stiebeling, Mrs. Anna E., 1458 Monroe St., Washington, D. C.
Stocking, Frederick N., 3456 Cadillac St., Detroit, Michigan.
Stoke, H. F., 1421 Watts Ave., Roanoke, Virginia.
Stover, Jacob E., Springwood Farms, York, Pa.
Strickland, C. H., Snow Hill, Maryland.

Taylor, C. W., 1723 Eye St., Eureka, California.
Theiss, Lewis Edwin, Muncy, Pennsylvania.
Thorpe, Will J., 1545 Divisarero St., San Francisco, Calif.
Tice, David, Savings Bank Building, Lockport, N. Y.
Turner, Lt. G. H., 932 Prospect Ave., Portage, Wisconsin.

University of Illinois Library, Urbana, Illinois.

Van Meter, W. L., Adel, Iowa.

Von Ammon S., c/o Bureau of Standards, Washington, D. C.

Walker, C. F., 2851 E. Overlook Rd., Cleveland Heights, Ohio.

Watson, John F., 16 Dumont Apart, Lynchburg, Va.
* Weber, Harry R., 123 East 6th St., Cincinnati, Ohio.
Weidhass, William H., Gaston St., Easthampton, Mass.
Wellman, Sargeant, Windridge, Topsfield, Mass.
Went, Robert E., 551 McDonough St., Brooklyn, N. Y.
Weschcke, Carl, 1048 Lincoln Ave., St. Paul, Minn.
Wigglesworth, Alfred.
Wilkinson, J. F., Rockport, Indiana.
Williams, Dr. Chas. Mallory, Stonington, Connecticut.
Williams, Moses, 18 Tremont St., Boston, Mass.
Windhorst, Dr. M. R., University Club Bldg., St. Louis, Mo.
* Wissman, Mrs. F. de R., 9 W. 54th St., New York City, N. Y.
* Wister, John C., Clarkson Ave. and Wister St., Germantown, Pa.
Wright, Ross Pier, 235 West 6th St., Erie, Pa.

Zimmerman, Dr. G. A., 32 So. 13th St., Harrisburg, Pa.

*** Life Member.**

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CONSTITUTION

ARTICLE I

Name. This Society shall be known as the NORTHERN NUT GROWERS ASSOCIATION, INCORPORATED.

ARTICLE II

Object. Its object shall be the promotion of interest in nut-bearing plants, their products and their culture.

ARTICLE III

Membership. Membership in this society shall be open to all persons who desire to further nut culture, without reference to place of residence or nationality, subject to the rules and regulations of the committee on membership.

ARTICLE IV

Officers. There shall be a president, a vice-president, a secretary and a treasurer, who shall be elected by ballot at the annual meeting; and an executive committee of six persons, of which the president, the two last retiring presidents, the vice-president, the secretary and the treasurer shall be members. There shall be a state vice-president from each state, dependency, or country represented in the membership of the association, who shall be appointed by the president.

ARTICLE V

Election of Officers. A committee of five members shall be elected at the annual meeting for the purpose of nominating officers for the following year.

ARTICLE VI

Meetings. The place and time of the annual meeting shall be selected by the membership in session or, in the event of no selection being made at this time, the executive committee shall choose the place and time for the holding of the annual convention. Such other meetings as may seem desirable may be called by the president and executive committee.

ARTICLE VII

Quorum. Ten members of the association shall constitute a quorum, but must include two of the four elected officers.

ARTICLE VIII

Amendments. This constitution may be amended by a two-thirds vote of the members

BY-LAWS

ARTICLE I

Committees. The Association shall appoint standing committees as follows: On membership, on finance, on programme, on press and publication, on exhibits, on hybrids, on survey, and an auditing committee. The committee on membership may make recommendations to the Association as to the discipline or expulsion of any member.

ARTICLE II

Fees. Annual members shall pay two dollars annually. Contributing members shall pay ten dollars annually. Life members shall make one payment of fifty dollars, and shall be exempt from further dues and will be entitled to same benefits as annual members. Honorary members shall be exempt from dues. "Perpetual" membership is eligible to any one who leaves at least five hundred dollars to the Association and such membership on payment of said sum to the Association will entitle the name of the deceased to be forever enrolled in the list of members as "Perpetual" with the words "In Memoriam" added thereto. Funds received therefor shall be invested by the Treasurer in interest bearing securities legal for trust funds in the District of Columbia. Only the interest shall be expended by the Association. When such funds are in the treasury the Treasurer shall be bonded. Provided; that in the event the Association becomes defunct or dissolves then, in that event, the Treasurer shall turn over any funds held in his hands for this purpose for such uses, individuals or companies that the donor may designate at the time he makes the bequest or the donation.

ARTICLE III

Membership. All annual memberships shall begin either with the first day of the calendar quarter following the date of joining the Association, or with the first day of the calendar quarter preceding that date as may be arranged between the new member and the Treasurer.

ARTICLE IV

Amendments. By-laws may be amended by a two-third vote of members present at any annual meeting.

ARTICLE V

Members shall be sent a notification of annual dues at the time they are due, and if not paid within two months, they shall be sent a second notice, telling them that they are not in good standing on account of non-payment of dues, and are not entitled to receive the annual report.

At the end of thirty days from the sending of the second notice, a third notice shall be sent notifying such members that unless dues are paid within ten days from the receipt of this notice, their names will be dropped from the rolls for non-payment of dues.

MY BUTTERNUT

The butternut crop is always sure
And raised at easy cost,
There is nothing it will not endure,
It is never harmed by frost.

The hopper and the cabbage worm
Care not to chew its leaves,
Comes weather hot or wet or cold,
This sturdy tree ne'er grieves.

It has no fear of 'tater bugs,

Or cultivation's errors,
The measly scale from San Jose,
And Green bug bring no terrors.

No squash bug races o'er its frame,
Nor caterpillar weaving,
It is never doped with Paris Green,
Yet never found a grieving.

It has no use for bumblebees,
No nodules on its feet,
But when the frost is on the pumpkin
Oft has the hay crop beat.

If you wish a crop that always comes
Without an "if" or "but,"
The surest thing in all the list,
Just plant a butternut.

JAMES H. HELMICK
Columbus Junction, Iowa



**Grand-pa come out to the butter nut tree,
And crack some nuts for Nicodemus and me.**

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Report of the Proceedings

at the

Twenty-fourth Annual Convention

of the

Northern Nut Growers Association

Incorporated

SEPTEMBER 11, 12, 1933

DOWNINGTOWN, PENNSYLVANIA

The first session convened at 9:00 A. M., September 11th at Minquas Fire Hall, with President Walker in the chair.

The President: "This is the opening of the 24th annual convention and I will introduce at once for his address of welcome, Rev. G. Paul Musselman."

Rev. G. Paul Musselman: "Thank you, Mr. Walker. It is my most pleasant duty to welcome you to Downingtown. Downingtown is quite an appropriate place for a convention because it is a place where we try to prepare beforehand for things we believe are going to happen, and try to get ready to prevent other things from happening."

Less than a mile from here to the north are stretches through the woods of infantry breastworks. Occupying that woods and those breastworks was the regiment under the command of Col. Stewart. The British were down by the Brandywine to the south, and it was supposed the British

would do the logical thing, which they never do, and come up to take Downingtown, which was at that time the most important industrial area in the United States. It was the arsenal of the Revolutionary War. It has continued to grow in its industrial manufacturing until it is now important in paper manufacturing.

That we are still trying to prevent nasty things from happening is strikingly evident in the fact that we have not had to call for help to take care of the people suffering from the depression. The Community Chest had, in the beginning, adopted a policy of preparing for an emergency by creating a fund for this purpose and has been able to do its work without any other than the usual annual drive for funds.

The first paper mill in America was established by Mr. Rittenhouse and after that paper mills began to be built in this valley. We have gone through a great cycle. The farms in this community used to be farmed for money, later interest was shown in the mills and the farmer farmed without money. Again they are being farmed with money by the industrialists and bankers and city men who are coming out and buying up these old farms for country places. I am happy to state that the farms are coming into their own again. It is this class of people that are interested in such things as nut trees as something new and different.

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It is Downingtown's faculty of being prepared for what is to come that makes it a particularly appropriate place for your convention. It is always a little ahead of the parade. We are proud of our local nut nursery which, in line with the spirit of the town, is just a little ahead of the parade. You too are a little ahead of the parade, so in that spirit I welcome you.

The Burgess has directed me to welcome you to Downingtown. I trust your stay will be interesting and helpful and we shall count it a privilege for you to call upon us for any further services you may require. I hope I shall be able to go on the bus trip with you but I am very busy and cannot make any promises for the moment. So, welcome!

Dr. Zimmerman: Fellow members of the convention! I am sure that it has been a pleasure to receive the fine welcome that Rev. Musselman has given us and I wish to assure him that it is a pleasure to be here. We are particularly glad to be in this district which is a land of plenty compared with other parts of the country which have suffered greatly from the depression. I am sorry that I do not live here.

We nut growers have been in the habit of thinking of growing nut trees on land which is good for nothing else, so that it is interesting to find nurseries using this good land and making a success of nut tree growing. In fact nut culture had its beginning in this district through Mr. Rush, and Mr. Jones and then Mr. Hershey.

I do not wish to take any more of your time as we have a heavy program and a lot of good speakers, and if they can add anything to nut culture, I shall be happy indeed.

Dr. Zimmerman: We welcome members of the Penna. Nut Growers Association. It is their field day tomorrow in connection with ours and we welcome them to this convention.

The President appointed the resolutions and the nominating committees.

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TREASURER'S REPORT

Balance September 1, 1932 as reported to Washington Convention	\$ 8.79	
Stamps and Canadian money redeemed by Treasurer	3.42	
Balance in Litchfield Savings Society	15.94	
	—	
Receipts	\$28.15	\$ 28.15
Profit on Bus Trip at Washington		15.00
Memberships @ \$3.50 old rate. No Nut News 21 @ \$3.50		73.50
Memberships @ \$4.00 new rate. No Nut News 3 @ \$4.00		73.50
Memberships @ \$4.50—\$3.50 to Assn. \$1.00 to Nut News 2 @ \$4.50		9.00
Memberships @ \$5.00—\$4.00 to Assn. \$1.00 to Nut News 43 @ \$5.00		215.00
Memberships @ \$5.00 without Nut News 3 @ \$5.00		15.00
Membership @ \$10.00—Mr. Ellis		10.00
Membership @ \$10.00 with Nut News—Mr. Neilson		10.00
Miscellaneous Receipts		9.00
		—
	\$	\$

Total Receipts	396.65	396.65
DISBURSEMENTS		
Refund to D. C. Snyder	\$ 2.00	
Programs Washington Convention	25.00	
Paid National Nut News	38.00	
Membership American Horticultural Society	3.00	
C. A. Reed. Expense Washington Convention	6.70	

Total	\$ 74.70	\$ 74.70
Balance to account for		\$321.95
Litchfield Savings Society	\$ 15.94	
Cash on hand or in bank	306.01	

Total	\$321.95	\$321.95

J. F. Jones' Experimental Work in Hybridizing Filberts and Hazels

By **MILDRED JONES**

Lancaster, Pennsylvania

The first crosses of the hybrid filberts were made in the year 1919. The small plants when taken from the nursery row were set 5 x 8 feet with the thought in mind of taking out every other bush in the rows when they began to crowd, and in case they were of value they could be transplanted to a permanent place. It was not thought that many of the plants would bear superior nuts promising enough to keep longer than to observe the type of nuts the bushes bore. The first lot of plants, which were mostly of the Barcelona cross, bore in the fall of 1924.

The object in view mainly was to produce, if possible, a variety or varieties that could be made a commercial proposition here or elsewhere in the eastern U. S. Not very much was thought at the time about the flavor or the quality of the kernel. The main thought was to get away from the corky substance adhering to the kernel of the most of the filberts. Barcelona, the main commercial nut in the West, has a lot of this, which makes the kernel unattractive and is probably more or less injurious to the digestive system because of the tannin content. After this fault was eliminated it was going to be necessary to work for size and quality of the nut.

The filbert blight has not been found on our place, so not much stress was put on the point of producing a blight-resistant or blight-free filbert. Probably if we had the filbert blight we would consider it more seriously.

The method used in crossing these hybrids was to remove the catkins on the pistillate plant at any time before they developed and scattered their pollen. The wood containing the catkins to be used for pollinating was observed closely in order to bring it in at the same time with the Rush pistillates by cutting and holding back in a cold cellar after the catkins were swelling well. This was the Barcelona which blooms very early.

The Italian Red, Cosford and Giant De Halles bloom later than the Rush so this was another problem. These were forced by cutting and putting in a sunny window. In cutting wood for pollinating, the cuttings should be large. The stored up starch in the wood then gives the catkins more to draw on. Apparently the filbert catkins and pistillates develop entirely from the stored up starch in the wood and do not draw on the roots at all. This being so it was figured they would develop just as well off the bush.

The last pollinating on the Rush was done in the spring of 1921. The catkins appeared to be all right and the limbs were cut and stored in the cellar. These were taken from the DuChilly. Finding they did not respond promptly to warmth it was seen that the catkins were drying up and getting stiff. As Father was very anxious to use this variety he tried soaking the limbs in water and then exposed them to the sun. Some of the catkins only swelled and then appeared to stop. The soaking was then repeated making it several hours and again they were exposed to the sun and warmth. Most of them developed nicely after this treatment. As those on the bush dried up and turned black it was thought probably the pollen used after treated as just mentioned was not good, but the pistillates developed promptly after being pollinated and the bush produced a large crop of nuts. I suppose these had been injured in the winter, but it would seem surprising that they could be made to develop artificially and the pollen be good.

It was found that Rush crossed Cosford made the largest nuts but the kernels of these nuts were not of the best quality.

On our eastern market I think it will be found that the longer type nuts will bring the premium in

price. I find in selling the nuts that people mostly desire the longer nuts, but will take the other nuts if they cannot get the longer ones.

This past spring we tried to graft several of the most promising hybrids in the older block of trees. We used the modified cleft graft method and we set the grafts on layered plants of the Barcelona filbert which were lined out in April. We grafted them in May after the layers had started to grow. Out of 200 plants grafted we have growing 16 nice plants from 18 to 24 inches tall, an 8% stand. The roots of the Barcelona layers died also on the grafts that failed to live. I believe the main trouble in this experiment was that there was not enough root system to carry the graft rather than the fault of the grafting, as most of the grafts started to grow. We should have tried grafting on layers established one year and we will try this next spring.

We have several very promising filberts in the older block of bearing plants. The Buchanan, No. 92, was named for President Buchanan, the only President of the U. S. from Pennsylvania, whose home is in Lancaster. No. 200 is also an excellent plant and was classed by my Father as one of the best in the collection. This plant has not been given a name as yet. I would like to have a name suggested that would be suitable. These two plants just mentioned bear nuts very much the shape of Italian Red. The kernels come out with little or no corky substance on the kernel. The flavor is very good and the plants have borne very well. We have a plant called "B." Letters were given to the plants where mice got in the seed beds and mixed the nuts. The nut of this plant is more the shape of Barcelona and is very good. It also bears well.

In the younger block of plants we have quite a few promising plants but these must be tested further before we can say anything definite for or against them.

I notice considerable leaf burn in the block of hybrids since the severe storm we had two weeks ago. Quite a few of the nuts were knocked off too but there is still a good crop which you will see tomorrow.

Since my Father died we have not done any hybridizing. We hope to do so in the future as the work is very interesting.

Mr. Stoke: Year before last I bought 2 lbs. of supposedly stratified nuts. I planted them but only one or two came up. This year they have made a pretty fair start so I know it takes two years to germinate. It seems as though it sometimes takes three years because these were stratified for a year and it took them two years to come up after I had them planted. I think you could probably get some stratified nuts from Carlton Nursery Co., Carlton, Oregon. I sent to Carlton for mine but they were shipped by someone else. It is my belief that the Carlton Nursery Co. controls the supply, so you will have to write to them for them.

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I have three or four dozen trees out of the first planting. They were planted in a very crowded position among walnut trees but are doing surprisingly well. The trees are now three years old and are shoulder high.

Prof. Slate: I planted some Turkish hazel nuts. They have been planted two years and have not yet come up, but I believe they will next year, as they take two years to germinate.

The following is a list of houses where seed of different species can be obtained. Submitted by the courtesy of Miss Jones:

Sources of CORYLUS

CHINENSIS

Hillier Bros., Winchester, England.
Vilmorin & Co., Paris, France.

CORYLUS COLURNA

Carlton Nursery Co., Carlton, Ore.

C. TIBITICA

Forest Experiment Station, Dehra Dun, British India.

Notes on the Commercial Cracking of Black Walnuts

By H. F. STOKE, Roanoke, Virginia

A year ago I reported to this body an experiment in the commercial production of black walnut kernels by factory methods, including the use of a power-driven cracking device. During the past year the experiment was continued, with the variation that the shelling was done as a home industry rather than as a factory operation. Ten families were furnished with hand-power cracking devices and the whole nuts were delivered to their homes. The workers received 10c per pound for cracking and picking out the kernels and in addition retained the shells for fuel. Forty-five thousand pounds of nuts were used in the experiment for which a uniform price of \$1 per hundred weight was paid.

The more efficient and conscientious workers produced as high as 15% of kernels per unit of whole nuts, which was slightly better than the production by factory methods. The general average, however, was around 12½%, or about the same for both methods. As to quality of product there was no appreciable difference. It is necessary to exercise greater care in the selection of workers where the work is done in homes without supervision than in the factory. By actual experience it was found that some workers would produce less than half the percentage made by the more efficient workers. Such workers were dropped.

Where relatively small quantities of nuts are to be shelled there is little to be chosen between the home-industry method and such factory method as was used by me. The cost of delivering the nuts to the homes may be roughly set over against the cost of operating a factory. Based on the hours of work required to produce a given quantity of kernels, the factory method is more efficient. On the other hand, the home worker will work for a smaller wage per hour. Where large quantities of nuts are available, commercial cracking by machine methods will be increasingly used in the future, especially if economic conditions so far improve that people will no longer work for starvation wages. Point is given to this observation by the fact that local buyers paid from 8 to 15c for country-produced kernels last season, while my bare cost, without overhead or profit, was 20c per pound.

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The most notable advance that has come to my attention during the past year in the way of commercial production of black walnut kernels is that contributed by Mr. C. E. Werner, President of the Forest Park Nut Company, of Ottawa, Kansas. Mr. Werner, who is 84 years of age and a veteran inventor with several notable inventions to his credit, has designed and built a machine that seems to mark a new era in black walnut kernel production. This machine, which is mounted on a truck, is not only used for the local operations of the company, but is moved from place to place in the performance of custom work, after the manner of a grain threshing outfit. Mention is made in company correspondence of cracking twenty thousand bushels of nuts for one customer in southwest Missouri. The following details were supplied by the manager of the company.

The machine has a capacity of from 75 to 100 pounds of kernels per hour. As they come from the machine they carry not more than 10% shells, and run from 28 to 30% full quarters. After being hand cleaned the net recovery of kernels represents from 10 to 11½% of the weight of the whole nuts. Custom work is charged for at the rate of from 3 to 5c per pound for the kernels produced. The cost of the final hand cleaning and packaging is given as 2c per pound, which makes a total production cost of from 5 to 7c per pound.

The operation of the machine may be briefly described as follows: The nuts are run through a revolving screen which separates and cleans them from all adhering husk and grades them into three sizes. They then pass through the cracker and thence, by conveyor belt, to the picker. This ingenious device holds the broken nuts with soft rubber rolls while a set of fingers literally pick the kernels from the shells. Careful sifting is the last step as the kernels leave the machine, after which they are hand-picked to remove any remaining pieces of shell. The owners advise that the machine has been built primarily for their own use, and has not yet been offered for sale. They would, however, consider building the machines for sale.

While the subject assigned me did not include the marketing of kernels, I cannot refrain from stating that no commodity is in greater need of orderly, organized marketing. In the meantime I would urge the small producer to cultivate his own local market as far as possible and refuse to produce at unprofitable prices.

Cracked black walnuts make an excellent supplementary feed for growing chicks and laying hens.

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I advertised in the Rural New Yorker, The American Magazine and Better Homes and Gardens. Mr. Hershey advised me I would go broke advertising but I wanted to see what would happen. The Rural New Yorker gave the best results. I got \$1.25 for a 2-lb. package. The kernels were in clean, first-class condition. I noticed some were advertised as low as 95c for two pounds. Some people in answering my advertisement said they had bought others that were not in first-class condition. I had no complaints about mine. In Better Homes and Gardens I did not get enough orders to pay for my advertising. I would not advise anyone to advertise there or in the American Magazine, as I got very poor results. I even got a bad check. The Rural New Yorker was very satisfactory.

The prices I paid locally were from .05 to .08 and sometimes .10 to .15 to old customers. Twelve and a half cents was the average price. I think maybe I should have advertised in a confectioners' journal in order to reach a large consumer source, but I felt at the time that I was using the only way I had of reaching a market.

This carton (showing a mailing container) is a 2-pound carton which I used in shipping in response to mail orders. It makes a very nice package that is received in good condition. I might add that the contents are 50 cubic inches.

Question: Do you use a paper bag inside?

Mr. Stoke: I line it with wax paper. I made a form and fold the wax paper around it to get the size. This makes a neat lining and then I just pour in the nuts and fold the top down.

Mr. Graham: Do you notice much difference in the kernels?

Mr. Stoke: Not in black walnuts. I found a few nuts which I could not use. The best nuts I found this year were in and about our locality.

Mr. Smith: Did you try offering prizes? Mr. Hershey and I once got almost tipsy testing a lot of walnuts in a prize contest.

Mr. Stoke: No. The best nuts I got would score not higher than the Thomas. They were brought in by different people and mixed together so that I was unable to tell their source.

The President: Do you do your separating of kernel and shell by hand?

Mr. Stoke: Yes. I use sieves, too. I use first a $\frac{3}{4} \times \frac{3}{4}$ inch mesh. It will take out most of the shell. Then for a minimum size, the best is 8 mesh to an inch, as used by the Forest Park Nut Co., Ottawa, Kans. This is smaller mesh and eliminates the smaller bits of shell.

Mr. Hershey: Did you have any correspondence with those people?

Mr. Stoke: I was interested in their machine for cracking nuts and I wrote the company a letter. Two or three months later I received a letter from Mr. Werner, a son of Mr. C. E. Werner, and who signed himself as Len Werner of the Werner Steel Products Co., and I received details and facts about the machine. He asked me if I would be interested in buying a machine or renting on a basis of kernel production. The younger Mr. Werner said they built the machine for themselves but could supply orders if they came in.

Miss Sawyer: Did you get any information on the price?

Mr. Stoke: No, none whatever. It seems to be taken from place to place mounted on a truck and cracks the nuts right on the job.

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Mr. Reed: Do you have any difficulty in cracking nuts when they are dry?

Mr. Stoke: The nut cracks best when not too wet or too dry but just right. If too dry, they are too brittle and you break up the kernels too much, also get too many spalls of shells. If wet you have other troubles. In the South and Southwest the summers get hot and so some nuts get rancid. The sweet type that have less oil seem to stand up better.

Question: Do you ever steam nuts before cracking?

Mr. Stoke: No, I haven't. To keep them in a damp atmosphere is also not good. Nuts should be kept dry while in storage. Kernels should also be kept in a dry place. I put them in trays of wire mesh and if the nuts are too green or I am in a hurry for them, I turn on the electric fan.

Last Fall I put some in cold storage in December. I also put some in cold storage in May and I found that I would not have needed to put any in cold storage until May as they have kept just as nicely as those stored earlier. But I find it is essential to have the kernels thoroughly dried before they are put away. If thoroughly dried they will not mold, but if kept in too warm a place they will turn rancid. To keep them in a damp atmosphere is also not good. If they are treated right they will keep indefinitely.

Dr. Zimmerman: Mr. Stoke, how many nuts did you crack?

Mr. Stoke: About 40,000 or 50,000 lbs.

Mr. Reed: What did you do with screenings?

Mr. Stoke: I fed them to the chickens. Some said that they would keep the chickens from laying but I found that by mixing about 25% with ordinary mash it worked fine.

Mr. Hershey: Did you find that it made the egg shells hard?

Mr. Stoke: No, the chickens had too much sense.

Question: What percent do you lose in sieving?

Mr. Stoke: When I did my fine sieving, I used a 4-inch screen. The shells were taken out entirely. I lost, maybe, 4%.

Prof. Reed: Do you people in Virginia have local names for different types of walnuts? What is the swamp black walnut?

Mr. Stoke: My own opinion is that there is only one black walnut in the East. We have a butternut that some people call the English walnut and some the white walnut. The Japanese walnut is sometimes called an English walnut. We also have the English or Persian walnut.

Prof. Reed: I believe the botanists recognize only the one black walnut.

Prof. Slate: I do not think there is more than one kind.

Mr. Stoke: It is interesting to know that while the black walnut has been higher in price than the English walnut, so that manufacturers have been substituting the English walnut for the black walnut, this year the black walnut has dropped as much as 10c per pound under the English and is now about 5c, I believe. Consequently the black walnut has come into its own and is now being substituted for the English walnut.

Mr. Frey: I would like to mention alternate years in bearing. If apple trees can be made to give a fair crop each year by good care, feeding and spraying, it is my thought that walnut trees will do the same thing under the same conditions. But we must remember that forming the hard shell is a most difficult thing for a tree to do.

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Prof. Neilson: I should like to draw your attention to a drawing sent me by J. U. Gellatly. (The paper was held up for all to see.) Just look at the size of the leaves. That is a tracing of the leaf of a hybrid English walnut and heartnut. He sent it along as evidence of its vigor of growth. This large compound hybrid leaf measured 27 inches from tip of the leaf to the bottom of the last leaflet, exclusive of the stem which was 5 inches long. Many of the larger leaflets measured 5 × 9 inches, shape, oblong ovate, edges of leaf, serrate, total width of compound leaf, 17 inches.

Dr. Smith: I should like to suggest to Mr. Frey that the theory he suggested might be supported if the tree were placed in a particularly favorable location.

Mr. Hershey: I should like to remind the audience of Judge Potter who told me some years ago that on his farm in Southern Illinois he got three doubles of his meadow grove of about 50 hickory trees, by using plenty of good horse manure, phosphoric acid, and potash. The increases were that he doubled the amount of growth and the size of the nut and changed the trees from alternate bearing to yearly bearing.

Black Walnut Notes for 1933

*By C. A. Reed, Associate Pomologist
Fruit and Vegetable Crops and Diseases
U. S. Department of Agriculture*

A number of developments in connection with the black walnut industry of the East have taken place during the last 12 months which appear to be of such importance as to justify special record at this time. Some of these have to do with the production and marketing of and prices received for, the wild product, others with certain features in connection with orchard and nursery management, and still others with walnut relationships both inside and outside of the genus.

The Black Walnut Kernel Industry

Production of black walnut kernels in this country is fully 99 per cent from seedling trees of the fields, forests, roadsides and dooryards. That from orchard and top-worked trees, while now considerably on the increase, due to recent activity in planting and top-working, will hardly become of relative importance for some years to come. The wild crop is actually on the increase each year, due partly to greater care now taken of old bearing trees and partly to the large number of young trees coming into bearing each year but more largely to the greater extent to which nuts are now being gathered and not allowed to decay on the ground.

This increase in production is working both for and against the permanent welfare of the industry, and by this use of the term "industry", it is meant to include the cultivated as well as the uncultivated phases. Consumption has increased tremendously. No figures are available as to either total production or percentage of total crop which is still allowed each year to remain on the ground until it becomes decomposed.

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However, it is the opinion of Baltimore merchants who have long handled this product that in certain large districts the wild nuts are now gathered closely and that very few are allowed to decay on the ground. There is no available information upon which to base a curve as to the probable increase in production which may be expected from young trees just beginning to bear or the thousands still too young to bear or yet the other thousands to be planted by squirrels each year. Whether or not the increase in consumption and its coincident change in eating habits of the American people will prove permanent after the return of normal times, remains to be seen, but it may be accepted as fact that the future of this country is likely to see greater competition in the home markets among foods than has been the case in the past and that, eventually, only those having the greatest values in nutrition and palatability will survive. Salesmanship may defeat this for a while but ultimately, palatability assumed, cash values and human tastes will most certainly arrive at pretty much the same point. The ultimate future of the walnut would therefore appear to depend largely upon its ability to become one of the fittest survivors.

One of the most important developments during the past year is of very recent occurrence. It is the fact that the 1933 season is opening with the highest prices received during the last two years. This may in part be due to reports that the outlook in the Tennessee—Kentucky—Virginia and North Carolina district is for a light crop. According to Baltimore merchants who have recently been consulted, consumption last year was the greatest in history and, while prices reached the lowest level since the depression began, relatively speaking, the total drop has probably not been as great as for other food products during the same period. These merchants look forward with confidence to a continuance of increased consumption.

This forecast is encouraging, but it is based on the assumption that there will be continued improvement in the manner of handling and packing the kernels for delivery. At present, considerable overhead is usually charged back to the farmers because of labor involved in cleaning, grading, and sometimes curing, after the kernels reach the city merchants. This handling is necessary with much of the output in order that it may be made acceptable to the manufacturers. One of the most desirable characteristics in connection with the sale of black walnut kernels is brightness of color. This is a matter largely due to the manner of handling during the process of harvesting, curing, and cracking. Once the kernels become dark, they cannot be brightened except by bleaching and removing the pellicles. However, the importance of prompt gathering as soon as the nuts fall from the trees, removing the hulls, and curing the nuts cannot be overestimated. These are matters easily within the ability of the producers to adjust.

The Orchard Industry

On the orchard side of the industry, several developments may be listed, although the majority are merely old developments newly emphasized.

Black walnut trees, seedlings and grafted trees alike tend to bear full crops not oftener than during alternate years, and with conditions at all unfavorable, full crops may be delayed for several years.

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Grafted trees of many varieties begin to bear their first fruits quite as promptly as with apples. Not infrequently walnuts appear by the end of the second year after grafting. This is especially true with top-worked trees.

Recent Adverse Weather Conditions

The spring and summer season of 1933 made an adverse combination in some localities. In the Ohio and Mississippi River Sections, the result was disastrous to a large part of the crop. In those sections, May was an exceedingly rainy month. June was equally hot and dry. It is in May that the blossoming periods of most varieties of walnut occur, also it is then that most of the nursery grafting is performed. Insofar as pollination was concerned, there were probably enough hours of sunshine during the blossoming period for the distribution of pollen to have been adequate and effective. On some of the trees the rains came at just the right time to wash practically all of the pollen to the ground. Had it not been for later pollinating trees either of the same variety, or of other varieties, or even of seedlings in the neighborhood, it is probable that no nuts would have set. However the actual set was about normal, but the heat and drouth which followed resulted in a drop which took the greater part of the crop. A pecan grower in southwestern Indiana, with between 300 and 400 grafted trees now of bearing age, recently reported that in August he was unable to find a single nut in his entire orchard. The result has not been quite as serious with the walnuts. Nevertheless, the crop prospects are reported to be not at all bright.

Nursery grafting in southern Indiana had literally to be performed between showers. Sap flow was excessive and the resulting stand below normal. The heat and drouth which followed killed outright many of the scions which had begun to grow. Thus, in that section the orchardists lost most of their crops and the nurserymen most of their grafts.

Walnut Relationships

In regard to walnut relationships within the genus, continued studies have led to certain conclusions which would appear to bear mentioning. One of these is to the effect that not all so-called "butterjaps" appear to owe their origin to staminate parentage of butternut but that they may be due to chance crosses of either Japanese walnut with Persian or possibly black walnut, or quite as often to reversion to the true Manchurian walnut, *Juglans mandschurica*.

Hybrids and Intermediate Forms

It is generally known that natural hybridity occurs so frequently between almost any two species of *Juglans* when growing together and blossoming simultaneously that it is unwise to plant the seed of either if pure types are desired. Intermediate forms, evidently between Persian (English) and black are fairly common throughout the East. The James River and O'Connor hybrids are well known typical examples. Such hybrids are most apt to occur in vicinities of Persian walnut trees. Crosses in which the Persian walnut is the staminate or pollen producing parent may sometimes occur but if so, they have never come to the attention of the writer. Crosses between these two species commonly have the Persian walnut as the pistillate or nut producing parent.

The most commonly seen forms which appear to be due to hybridity are in the case of certain Japanese walnut seedlings in the East. The offspring of these trees frequently takes on much of the character of the American butternut. Nuts of this type have been recognized by this Association and other authorities as "butterjaps." In his Manual of American Trees, Dr. Albert H. Rehder of the Arnold Arboretum, Jamaica Plains, Mass., recognizes crosses between the Japanese walnut and American butternut under the technical name of *Juglans bixbyi* after the late Willard G. Bixby of the Association by whom the matter was called to his attention. However, it is not certain that nuts definitely known to represent a cross between these two species have yet been

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brought to notice.

Butterjaps

It has been commonly assumed that nuts of the butternut type, from trees grown from Japanese walnut seed are due to butternut hybridity, but the theory is clearly open to reasonable doubt. Nuts of this identical type are common in the orient where the butternut does not occur and also they sometimes occur in this country on trees grown from imported Japanese walnut seed. The late Luther Burbank wrote the Department of Agriculture in 1899 that in California where he had grown many thousands of seedlings from both imported and California grown seed, he was unable to detect the slightest differences in foliage, yet the trees were apt to produce nuts of any one of three types then known as *Juglans sieboldiana*, *J. cordiformis* or *J. mandschurica*. He wrote that "They all run together and are evidently all from the butternut family."

An authentic case of butterjaps from imported seed was made public during the first annual meeting of the Pennsylvania Nut Growers' Association which was held in Harrisburg on January 11 of this year. Butterjaps were on display during that meeting which had been grown by Mr. Ross Pier Wright of Erie, Pa., from seed which he had imported directly from Japan. His trees are growing in the outskirts of Westfield, Chautauqua County, N. Y., and within a mile of Lake Erie.

In July of this year, Dr. E. A. Scott of Galena, Md., called the attention of the writer to a number of fine trees in his small town, all of which had been grown by him from *J. sieboldiana* seed obtained from a tree nearby and "every one" of which was bearing "butternuts," as he and his neighbors call them. The American butternut does not occur in that part of Maryland which is on the upper end of the Chesapeake Peninsula, probably 10 miles from Chesapeake Bay. Both black and Persian walnut trees are very common in that region. The tree which bore the original seed is a typical Japanese walnut. It stands at the end of a row of Persian walnut trees along the driveway of a private country lane. There are several black walnut trees, perhaps 500 yards to the southwest, but no butternuts for many miles. As the Persian and Japanese walnuts blossom at about the same time and the black walnut considerably later, it would seem altogether probable that if any cross had taken place it would have been Japanese x Persian, rather than Japanese x black. The chances of a Japanese x butternut cross would have been so remote as to be altogether improbable.

Many years ago, Judge F. P. Andrus of Almont, Mich., planted one tree each of Persian and Japanese walnuts in his dooryard. Both soon came into bearing. Squirrels planted nuts in the ground and presently the yard was filled with offspring, the majority of which were of the type now called butterjaps. The trees were extremely vigorous but the nuts were of so little value that all were finally cut down. Butternut trees are common in Michigan and butternut pollen may have been responsible for these crosses but circumstantially the evidence pointed much more strongly to Japanese x Persian crosses than to Japanese x butternut crosses.

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Other cases of these sorts might be cited, but the evidence which the writer has been able to bring together up to the present month, September, 1933, strongly indicates that butterjaps may be due to either an actual cross with a Persian or black walnut and possibly with butternut or to reversion to a parent oriental type. So far, it has been out of the question to hazard a reasonably safe assumption as to the staminate parent of all particular crosses by merely studying the botanical characteristics of the butterjap offspring.

Several years ago Mr. Bixby planted a number of butterjap seed nuts, hoping that under the Mendelian law, the characteristics of the two parents would segregate themselves. The trunk and bark of some of the trees resembled black walnut quite distinctly, while none resembled the butternut. So far as is known to the writer, none of the trees have yet fruited. One of the several butterjap trees in Galena, Md., previously referred to, produced nuts rather more like black walnuts than butternuts. These two instances therefore, would suggest Japanese x black walnut parentage.

Black Walnut Root Toxicity

On several occasions discussions of root toxicity between the black walnut and certain of its neighbors have taken place at Association meetings. The theory that black walnut trees give off toxic properties from their roots, which are fatal to other plants, is therefore not new. Some years ago the Virginia Experiment Station definitely isolated a toxic substance which was held responsible for the death of tomatoes, potatoes, alfalfa, blackberry plants and apple trees when these other plants were grown in close enough proximity for their roots to come in contact with those of the black walnut. This work was reported in various publications and was written up by several different authors.

Since then, as well as before, the writer has looked for similar evidence, but, so far, in vain. Each of these crops, including tomatoes, potatoes, alfalfa, blackberries and apples, have been seen growing in as close contact with black walnut as they could possibly be placed. Oftentimes they have been found much nearer to black walnut trees than would have been wise to place them to oak, hickory, ash or other species of large growing trees. This does not mean that when the roots are in actual contact the toxic agent of the black walnut roots would not prove fatal to the other plants but it does indicate that in the great majority of cases there is no practical danger.

Anyone who has doubt about the healthy condition of these other species when grown close

together with black walnut trees, may obtain evidence for himself by noting the frequent combination of this sort easily found in fields and gardens of the country and small towns. It is surprising how often these combinations of black walnut and other species are to be seen. Any unprejudiced person could hardly fail to become convinced that, in the great majority of cases, the danger is of small practical consequence. The roots of the black walnut run deeply under ground and it is entirely conceivable that in deep soil they do not ordinarily come up to the shallower levels of the roots of most other species.

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Summary

A summary of the year's developments might be arranged about as follows:

- (1) More black walnut kernels were harvested and consumed during the year than ever before.
- (2) Prices to the farmer reached about the same low level of the year preceding, but the total drop during recent years was probably not in proportion to the drop of most other food products.
- (3) Crop prospects in 1933 are unfavorable for another large crop. Prices are starting out considerably higher than for several years.
- (4) Production of black walnuts from grafted trees under cultivation is altogether insignificant in comparison with that from chance seedlings receiving no special cultivation.
- (5) Grafting and planting are taking place at too moderate a rate to materially alter the ratio of production from seedling to that of grafted trees in the near future.
- (6) There has been considerable improvement during recent years in the manner of preparing and packing black walnut kernels for market, but there is need for further advance along this line.
- (7) Merchants engaged in handling black walnut kernels predict that there will continue to be a normal steady increase in consumption, now that the market has become established, trade channels opened up, and consumers habits somewhat established.
- (8) Walnut hybrids occur frequently in nature. So far, none have appeared which were of special value because of the character of nuts which they produce. So-called butterjaps appear to be possible from either certain crosses or from reversion to parent oriental types.
- (9) Ordinarily, other crops may be interplanted with black walnuts with as great safety as with most other equally large growing and deep-rooted trees.

Is the Information We Have on Orchard Fertility of Value in the Nut Grove?

By PROF. F. N. FAGAN, *Professor of Pomology*
The Pennsylvania State College

Many of the association members present are also general fruit orchard owners of this state. I am glad to meet with you and must confess that it has been many years since I have had the pleasure of attending the annual meeting of this association. To be exact, the last meeting I attended was the annual meeting held in Lancaster some seven years ago. It is not that the Pennsylvania Agricultural Experiment Station lacks interest in nut culture that keeps it from doing work along nut investigational lines, but because the older and more extensive apple, peach, cherry, grape and berry industries have called upon the resources of the station to its working capacity.

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When Mr. Hershey wrote asking me to speak before this meeting I felt that the only information we had at the station that would fit into the picture was the information we have regarding orchard fertility. I therefore gave him the subject, "Is the information we now have on general orchard fertility of value in the nut grove?"

First, let me touch upon some of the papers given this morning. I think it would be well for the nut meat industry to look into the department of health's requirements governing the health inspection of workers handling food products. I also suggest looking into the possibility of the selling of nuts and nut meats by interested high school boys and girls in our many towns and cities.

The question of annual bearing of nut trees is a subject needing investigation. I rather expect we shall find that this factor is closely connected with over-production of a tree one year, fertility and moisture supply, or, in other words, the nuts may be much like apples. While the nature of tree growth may tend to cause trees to be alternate producers, man may upset this natural habit

to some extent by proper cultural practices and thus cause the tree to produce, not a full crop in the off year but at least some fruits that will be on the profit side.

As to the toxic effect of some of our nut trees upon growth of other plants growing near by, I rather expect we shall find as time goes on that instead of the trees having a toxic effect they have a robbing effect upon soil moisture and food. One thing that leads me to this belief is that years ago we taught that one reason for seeding a cover crop in the orchard was to have the cover take the moisture from the soil in the fall of the year and in that way check tree growth. We now know that a mature apple or peach tree will reverse this during the growing season and will take its full share of moisture and food from the soil and really take these away from the cover crop. We saw this occur during the dry years of 1929 and 1930 with covers that had been seeded in June. During both these years, in our orchard blocks where the water holding capacity of the soil was low, the cover died over the tree root feeding spaces. Some may have said that the trees were having a toxic effect upon the soil. This was not the case for, in 1932 and 1933, both years of plenty of moisture supply, the covers have grown well around the trees in these blocks.

I shall now ask you to refer to the conclusions on page 3 of our Bulletin No. 294, issued by The Pennsylvania State College, which has just been distributed to you. These conclusions are, of course, based upon our work in an apple orchard but I believe they will apply closely to the management of nut orchards.

Lessons from Fertility Studies in the Experiment Orchard

Most of the experiments in this orchard have now completed 25 years; there have been few changes and these minor ones. Certain lessons may be drawn from this quarter century of research:

1. The fertility of an orchard soil is more than its plant food content. It involves the nature of the soil, its depth and topography, its previous treatment, the use of fertilizers and manures, the amount and nature of the cultivation and the covers or sods grown. Fertilizers are only part of the problem of soil fertility.

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2. In this orchard any treatment that has influenced the trees at all has done so in the following order: first, the cover crops; perhaps several years later, leaf color; shortly after, branch growth and circumference increase; and last of all, yield.

3. The reason for this sequence of results is that the treatments, whether chemical fertilizers, manure, or cover crops, have influenced yields chiefly by changing the organic matter content of the soil; that is, those treatments which have resulted in the production of larger cover crops have ultimately resulted in the production of more fruit.

4. The organic content of the soil has been a considerable factor in determining the amount of water in this soil. Those treatments which have built up the organic content have kept the soil in condition to soak up rainfall rather than to lose it by surface run-off. A larger water supply, in turn, has produced more cover crops.

5. The site of this orchard seems nearly level to the casual eye; yet slope, with its accompanying erosion, together with differences in depth of soil, have created nearly as large differences in growth and yield as any treatment. Good treatments have nearly offset the initial disadvantage of poor soil; but it is more economical to plant the orchard on good soil than to attempt the improvement of a poor soil.

6. A short, non-legume sod rotation is an efficient means of building up a depleted orchard soil. After a sod of any kind becomes thick tree growth is checked and yields decline. Orchard sods should be turned under or partially broken, frequently.

7. Moisture conditions often are more favorable in the sod orchard than in the cultivated orchard. Runoff is checked by a sod and less water is used by a sod in mid-summer, after it has been mowed, than by a heavy cover crop.

8. Under a non-legume sod the soil nitrate supply becomes very low in late May or early June, necessitating early applications of nitrogenous fertilizers. Annual applications of 10 pounds of nitrate of soda per tree, or its equivalent in sulphate of ammonia or other forms, have proved profitable in this orchard. Superphosphate, in light applications, has increased sod and cover crop growth.

9. Trees receiving annual tillage with July seeding of cover crops have not done as well as those under sod rotations. If the cover crops are seeded in early June, as has been practiced since 1929, the difference may not be marked.

10. To maintain equal yields, Stayman and Baldwin must make longer branch growth than York.

In addition to these conclusions I will say that any grower who will keep his orchard soil in a state of fertility (by use of manure, proper farm crop fertilizers—nitrate, phosphate or potash alone or in combination with each other—liming and, if necessary, drainage) which will permit growing clovers, alfalfa, soy beans, cow peas, vetch, or any of the legumes, and who really does grow them as covers in his grove or orchard, turning them back into the soil with a minimum period of spring cultivation—just enough to prepare a seed bed—will never need to worry about his soil fertility or water holding capacity.

You note that I say a minimum of cultivation. We taught twenty years ago that cultivation should continue during June, July, and August. We now feel that this teaching was wrong. We can see no benefit from this long summer cultivation but do see some harm. Cultivation during the hot weather of June, July, and August will only aid in burning out the organic matter in the soil, just the very thing we plant a cover for. Many of the covers such as alfalfa, sweet clover and non-legume grasses can be harrowed very heavily in early spring after the frost is out of the ground, thus checking their growth for several weeks, and it is in early spring before the first flowers open, and while open, that the tree needs its nitrogen to aid in the set of fruit, and season's tree growth; the checking of the cover's growth in early spring gives the tree the chance to get its food.

Dr. Zimmerman: I am very grateful for the address of Prof. Fagan.

Dr. Smith: I want to express my appreciation of Prof. Fagan's paper. I want to call to the attention of this convention of people that this young man has actually admitted his hard headedness, that he has been willing to let a tree compel him to change his thinking.

Progress Report on Kellogg Nut Cultural Project of the Michigan State College

By J. A. NEILSON, M. S. C., East Lansing

The Nut Cultural Project so generously supported by Mr. W. K. Kellogg of Battle Creek made good progress during the season of 1933. The various phases of this project are briefly discussed under their separate headings as follows:

Search for Superior Trees

This feature of our nut cultural programme is of the utmost importance and will continue to be so until the entire state has been thoroughly explored. In our search we have been greatly helped by interested people throughout the state and elsewhere who report the existence of good trees or who send specimens of nuts from superior trees. This voluntary help is very useful and is much appreciated.

Of the various methods of searching for good trees, nut contests are the most efficient and economical. Through the medium of national contests this Association has discovered many good varieties, and several of these new varieties are now being propagated. In view of the discoveries resulting from the Association contest in 1929 and our state contest in the same year, it was deemed advisable to stage another contest in 1932.

An article setting forth the terms of the contest was sent to all the daily, weekly, and agricultural and horticultural journals and was given very wide publicity by these press agencies. A great deal of interest was shown in our contest and more than 1600 exhibits were entered by approximately 700 exhibitors.

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Several good strains were brought to light by this contest, most of which were unknown before the contest was staged. The prize winners and the awards are as follows:

Black Walnuts

Daniel Beck, Hamilton, Mich.	1st \$15.00
Harry Webber, Cincinnati, Ohio	2nd \$10.00
E. Gray, Williamston, Mich.	3rd \$ 5.00

Hickories

Mrs. Ray D. Mann, Davison, Michigan	1st \$15.00
D. Miller, North Branch, Mich.	2nd \$10.00
Lyle Hause, Fowlerville, Mich.	3rd \$ 5.00

English Walnuts

Harry Larsen, Ionia, Mich.	1st \$10.00
D. B. Lewis, Vassar, Mich.	2nd \$ 5.00
J. W. Jockett, Hart Mich.	3rd \$ 3.00

Butternuts

Claude Mitchell, Scotland, Ont.	1st \$10.00
M. E. Alverson, Howard City, Mich.	2nd \$ 5.00
Frank Luther, Fairgrove, Mich.	3rd \$ 3.00

Heartnuts

Claude Mitchell, Scotland, Ont.	1st \$10.00
Fred Bourne, Milford, Mich.	2nd \$ 5.00
J. U. Gellatly, Gellatly, B. C.	3rd \$ 3.00

Chestnuts (Hybrids)

John Dunbar, Oshtemo, Mich.	1st \$10.00
D. N. Dean, Shelbyville, Mich.	2nd \$ 5.00
J. W. Jockett, Hart, Mich.	3rd \$ 3.00

Jap. Walnuts

Harold English, Chatham, Ont.	1st \$10.00
Harold Evers, Petoskey, Mich.	2nd \$ 5.00
Bob Cardinell	3rd \$ 3.00

If and when another contest is held a larger number of prizes will be given provided sufficient funds are available. The experience gained in the 1929 and 1932 contests indicates the desirability of holding at least three contests and five would be better, and to have the contests held annually. It is very difficult to advertise a nut contest so that every person in rural sections knows of it and moreover, even if it were thoroughly advertised in any one year, it would not be possible to get nuts from all good trees because of the irregularity in fruiting habit of nut trees. The experience of others who stage contests will substantiate this opinion.

It is a great satisfaction to record the discovery of some promising pecan trees near Vandalia on the farm of Clyde Westphal. These trees were reported to me by Mr. Harry Burgart of Union City, and at the first opportunity I went with Mr. Burgart to examine the trees. There are 19 trees in the grove and the largest and best fruited tree is about 45 feet tall and nearly one foot in diameter at the base. The nuts are of medium size, crack easily, and contain kernels of good quality. A good crop was borne last year and other satisfactory crops have been secured for several years. It is quite likely that this tree would not mature nuts in a short growing season or in a season of low heat units, but the fact that it has done so well in recent years in growth and nut production is very encouraging, indeed. Plans are being made to propagate this strain.

Another good pecan sample was received from Mr. B. B. Dowell of Paulding, Ohio. This tree is hardy and produces nuts slightly larger than the Westphal tree. The nuts have good cracking quality and flavor of kernel and are worth propagating for northern regions.

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Propagation

The propagation of selected strains of nut trees is not primarily the function of an Experiment Station, with the exception of such work as may be necessary to establish on Station property a sufficient number of trees to furnish scionwood for experimental purposes and to supply interested parties with what they require. We believe that nut tree nurserymen should undertake the propagation of new varieties of proven merit and we have endeavored to furnish our local nurserymen and others with scionwood of our best native selections or introductions. Such propagation as we have done is with established trees and can properly be considered as topworking. This feature of our project is discussed under that heading.

Topworking

Our programme of top-working was carried on in 1933 to the full extent of time and funds available and a special effort was made to top-work some of the worthless pignuts and bitternuts with scions of hicans and hybrid hickories. In a former report, reference was made to the difficulty in grafting shagbark and shellbark scions onto pignuts; and here again I want to say my first observation still holds especially with the shagbarks. I do not have a single shagbark scion left on pignuts out of several hundred set during the last four seasons.

Our results with hybrid hickories and with hicans have been much more encouraging in so far as the set of scions and growth is concerned. The following varieties have done well on the pignut or bitternut—Burlington, Beaver, Cedar Rapids, Creager, Dennis, Des Moines, Fairbanks, Kirtland, Laney, Lingenfelter, McCallister, Stratford, and Shinnerling. It is definitely known that most of these varieties are of hybrid origin with the exception of Cedar Rapids and Kirtland. The buds of the variety I have labelled as Cedar Rapids do not look like pure shagbarks and it is possible that a mix up has occurred in the labels.

A satisfactory start was made in propagating the prize-winning shagbark hickories of our 1932 contest and further work will be done with these kinds in the present season.

Good progress has been made in propagating our best varieties of black walnuts, English walnuts, and Chinese walnuts. We now have several trees some of which are quite large that have been top-worked to scions of Wiard, Allen, Grundy, Rowher, Ohio, Creitz, Carpenter, and Stambaugh black walnuts. In English walnuts we have Carpathian No. 1, 2, and 5—Crath, McDermid, and Broadview. This latter variety is above the average in size, cracks easily and has a good kernel. Still more important it is believed to be hardy and is definitely known to have endured 25° below zero F. This variety was sent by Mr. J. U. Gellatly, our enthusiastic nut tree hunter from British Columbia. Mr. Gellatly has brought to light a considerable number of heartnuts and a few English walnuts. One of his latest finds is an English walnut that produces very large almost round thin shelled nuts. This tree grows on high bench land near Okanogun, B. C. and is a seedling of a tree growing in the high altitudes of Kashmir in Northern India. Some of the heartnuts sent by Mr. Gellatly are amongst the largest I have ever seen and possess good cracking and extraction qualities. Scions of these varieties have been ordered from Mr. Gellatly and we hope to establish at least one good tree of each kind as a source of propagating material. We also have several grafts of an excellent Chinese walnut which we obtained from Mr. George Corsan of Islington, Ontario. This variety bears a large nut with a thin well sealed shell and a first-class kernel, and has been named Corsan.

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New Plantings

The planting programme for 1933 included the planting of about 40 acres on the Collver part of the Kellogg Farm near Augusta, but this had to be reduced by 50% because of financial troubles caused by the closing of the banks in which Mr. Kellogg was a depositor. In addition to the new plantings a considerable number of replacements had to be made particularly in the chestnut groves. The following table shows the number of each species and variety planted:

(a) Black Walnuts

Variety	Number
Allen	2
Wessell	5
Thomas	20
Beck	2
Bohamin	2
Edras	3
Grundy	3
Homeland	3
Howell	2
Grabill	2
Hauber	1
Heplar	3
Mintle	2
Patuxent	7
Ruddick	1
Stanley	1
Tasterite	1
Stover	1
Worthington	1
McMillen	1
Hunter	1
Birds Eye	15
Carpenter	10
Miller	5
Ten Ecyk	10
Ohio	10

Stabler 15

(b) Chinese Walnut

Seedlings 20

(c) English Walnut

Seedlings (Crath) 21

Alpine 10

Mayette 10

(d) Butternuts

Seedlings 50

Hickories

(a) Hybrids

Stratford 5

(b) Shagbark

Glover 5

Romig 3

(c) Shellbark

Stephens 2

(d) Pecans

Indiana 1

Niblack 4

Greenriver 5

Kentucky 5

Butterick 6

Posey 5

Carlyle 3

Jeffrey 3

Seedlings 50

(e) Hicans

Des Moines 7

Gerrardi 5

Burlington 4

Wright 3

Burton 2

Norton 2

Hazels

(a) Turkish Hazels

Seedlings 40

(b) Jones Hybrids

Seedlings 14

(c) Corylus Vilmorinii

Seedlings 1

Chestnuts

(a) Chinese

Seedlings 251

(b) Japanese

Seedlings 20

Good results were secured with all of the above mentioned kinds except the Chinese and Japanese chestnuts. The reason for this failure is given elsewhere in this report.

Demonstration Work on Grafting

This feature of our programme has not received as much attention as should be given to it owing to lack of scionwood of local origin and to a desire to work over nearly all the trees on the Kellogg Farm before attempting much outside work. We now have a fair supply of scionwood on our station trees and are in a position to proceed with a modest top-working programme out in the state.

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The principal object of this scheme will be to establish sources of scionwood at various places in the state and to instruct interested parties in the art of grafting. A total of 25 demonstrations

have already been given and in nearly every case improved varieties were established and local interest was aroused. It is a matter of satisfaction to report that at least four men have made a commendable start in top-working ordinary seedling trees with scions of superior sorts and one of these men, Mr. Charles Pepper of Berlamont, proposes to establish a small nursery of Allen black walnuts.

For some time the writer has planned to interest the Future Farmers of America in planting nut trees, but was too busy with other duties to make the proper contact. Just recently arrangements were made with Dr. Gallup, the State Supervisor of Vocational Agricultural Education, for a presentation of the scheme of nut tree planting to these enterprising and energetic young men. My object is to interest at least one member of each group in either top-working local seedlings with the best hardy varieties or in planting good nut tree varieties. Plans are also made to interest the members of the State Horticultural Society in planting some of the best varieties of Michigan origin.

Educational Work

This feature of our project has not been given a great deal of emphasis because it was believed we did not have enough information of local nature to justify us in conducting an extensive educational programme. We now believe we have enough information to make a start and I have arranged a series of meetings with county agents at their regional conferences in the southern part of the lower peninsula. Each regional conference includes the county agents and associated workers in several counties and affords one an opportunity to present our programme to State officials who can give us most effective cooperation. This project along with a similar one for the Future Farmers of America should create more interest in nut culture.

General Notes

The establishment of hardy blight resistant chestnuts of good quality is an important objective in our nut cultural project, and one in which only partial success can be reported. Approximately 700 Chinese and Japanese Chestnut trees have been planted but only about 260 of these trees are living. Some of these casualties were due to dry weather, rabbits and woodchucks, but the major part were due to unsuitable soil conditions. Our observations show that the Asiatic chestnuts will not thrive in an alkaline soil, as nearly all the losses occurred on an area that had a heavy application of marl. On the area where the trees are now growing well the soil is acid and supports several acid tolerant plants.

A superior strain of Chinese Chestnut was found in a lot of about 60 trees which the writer sent to Mr. W. R. Reek of the Experiment Station at Ridgeway, Ontario, in 1927. The best tree has made a good growth, and bears large nuts of good quality. Scions of this tree were obtained last spring and grafted onto several Chinese seedlings at the Kellogg Farm. An attempt will also be made to graft a few large—unfruitful Japanese chestnuts at various places in the State with scions of this good Chinese strain.

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An interesting bit of information on the hardiness of the black walnut and butternut has just come to hand from Col. B. D. Wallace of Portage, La Prairie, Manitoba. Col. Wallace reports the occurrence of a seedling black walnut in his nursery that is quite hardy and which bore fully matured nuts at an early age. He also has a fine grove of butternuts that are entirely hardy and which bear good crops of nuts. These butternut trees grew from nuts secured from France about twenty years ago. The trees are quite hardy but other butternut seedlings from Ontario seemed to lack hardiness. No data are at hand to show where the French butternut trees came from, but inasmuch as the butternut is not a native of France it is almost certain that the trees came from North America and probably Quebec Province. In any case the trees are hardy and are reported to give satisfaction to the people in the Prairie Provinces.

Mr. Kroodsmas, Extension Forester, reports the occurrence of a moderately large black walnut which bears nuts of good quality and fair size at Houghton in the extreme northern part of the Upper Peninsula. These accessions to our knowledge of the hardiness of the walnut and butternut are valuable and would suggest that these species can be grown much farther north than their native range.

In a former report reference was made to an attempt while in the service of the Ontario Department of Agriculture to interest the members of the Womens' Institute in Ontario in planting nut trees, but not much progress was made until last spring. The writer had in Ontario about 800 fine seedling heartnuts which he was unable to sell and which had to be moved. It seemed regrettable to destroy them and finally the trees were given to Mr. Geo. Putnam, Supt. of Institutes for distribution in my old home county and in another county where I worked for some time. The trees were readily accepted and much interest was aroused. So much in fact that I was kept busy writing letters to people who wanted to share in the distribution. Unfortunately, I did not have enough trees to meet all demands and so had to refuse many an Institute member who

Notes on the Filbert Orchard at Geneva

By G. L. SLATE
Experiment Station, Geneva, N. Y.

Winter killing of the wood and catkins is probably the limiting factor in growing filberts in Western New York. Satisfactory varieties must possess catkins hardy enough to provide sufficient pollen for pollination purposes. There must also be very little killing of the wood or the crop will be reduced in proportion to the amount of wood that is winter injured. Several years observations in the Station filbert orchard at Geneva have shown a great variation in hardiness of filbert varieties. With some varieties the catkins are severely injured each winter, with others, very little injury occurs. Because of this great variation in hardiness we must accumulate as much data as possible concerning the ability of varieties to withstand our winters, especially the mild winters, before we are in a position to make definite variety recommendations.

Last winter, 1932-33 was especially hard on filberts, in fact, much more winter injury was experienced than at any time since the Station orchard was set in 1925. It was a good season to separate the hardy and tender sorts. Throughout the winter the weather was exceptionally mild and favorable for that type of winter injury due to early growth activity. In a normally cold winter catkin killing as a rule is not very serious, except on a few tender varieties. Although catkin killing was so serious at Geneva, S. H. Graham of Ithaca, who is growing a number of varieties on an exposed location where winters are more severe than at Geneva, reports that his trees suffered less catkin injury than at any time since he has been growing them. Catkin killing does not seem to be due to extreme cold during the winter and rarely are the catkins injured before late February or early March. Injury may be severe even though the temperatures are not lower than the catkins are thought to endure when in bloom. Apparently the injury may be due to the cumulative effect of desiccation throughout the winter months, this effect becoming apparent shortly before the catkins bloom. Catkins forced into bloom prior to late February bloom normally and without apparent injury.

The data on winter injury of catkins is being accumulated for two purposes. First, it is being used as a basis for recommending varieties as pollinators; and second, it is being used in selecting parents for breeding hardy varieties.

The amount of winter killed catkins is determined by observation during the blooming season in late March. All catkins that fail to open, or open weakly and shed no pollen, are considered winter killed and the proportion that are killed is expressed in per cent.

Based on the amount of winter injury of catkins during the winter 1932-33, I am making four groups. First, those varieties in which all, or practically all the catkins were killed. In the varieties suffering such severe catkin injuries, much of the wood was killed, but this will be treated separately.

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The varieties in this group are Nottingham, Early Prolific, Garibaldi, Kentish filbert, Pearson's Prolific, Princess Royal, the Shah, Webb's Prize Cobb, Bandnuss, Barr's Zellernuss, Berger's Zellernuss, Grosse Kugelnuss, Heynicks Zellernuss, Lange von Downton, Multiflora, Sickler's Zellernuss, and a *Corylus rostrata* brought into cultivation from a glen a few miles away. The planting of varieties in this list is not recommended.

The second group includes those sorts in which 50 to 90 per cent of the catkins were killed. The varieties are Barcelona, Daviana, Fertile de Coutard, Montebello, Cannon Ball, Duke of Edinburgh, Duchess of Edinboro, Prolific Closehead, Red Skinned, Kadetten Zellernuss, Kaiserin Eugenie, Kunzemuller's Zellernuss, Liegel's Zellernuss, Prolifique a coque serree, Romische Nuss, Schlesierin, Truchsess Zellernuss, Voile Zellernuss, Kruse, and Littlepage, a variety of *Corylus americana* from Indiana. Some wood killing occurred among the varieties in this group. None of these varieties should be depended upon for pollination purposes.

The third group includes those varieties experiencing 20 to 50 per cent winter injury. The varieties are Kentish Cob, Italian Red, Bollwiller, Red Aveline, White Aveline, and Vollkugel. These varieties may be planted with caution if too much dependence is not placed upon them as pollinators.

In the fourth group are those with less than 20 per cent of catkin injury. These are Clackamas, Cosford, Minna, Early Globe, English Cluster, Medium Long, Oregon, Purple Aveline, Red Lambert, White Lambert, D'Alger, Althaldensleber, Ludolph's Zellernuss, Luisen's Zellernuss, Neue Riesennuss, Eickige Barcelonaer, and Winkler and Rush, the latter two being varieties of *Corylus americana*. Varieties from this group and the third group should be used as pollinators and as parents in breeding work to develop catkin hardy varieties.

Winter killing of the wood has not been as extensive nor as serious as catkin killing. It is usually slight and confined to a few varieties but during the past winter 1932-33, many varieties killed back severely.

The varieties are grouped according to the amount of winter injury of wood. Varieties in which more than 50 per cent of the wood was killed are Nottingham, Early Prolific, Garibaldi, Princess Royal, Webb's Prize Cob, Bandnuss, Grosse Kugelnuss, Jeeves Samling, Kaiserin Eugenie, Multiflora, Kurzhullige Zellernuss, Lange von Downton, and the *Corylus rostrata* previously mentioned.

Varieties experiencing from 20 to 50 per cent of wood killing were Barcelona, Red Aveline, Montebello, Berger's Zellernuss, Einzeltragende Kegelformige, Heynick's Zellernuss, Prolifique a Coque serre, Sickler's Zellernuss, Voile Zellernuss, and Russ.

In the following varieties from 5 to 20 per cent of the wood was winter-killed: Minna, Bollwiller, Duchess of Edinboro, Pearson's Prolific, The Shah, Barr's Zellernuss, Kunzemuller's Zellernuss, Liegel's Zellernuss, Romische Nuss, Schlesierin, Truchsess Zellernuss, Vollkugel and Littlepage.

Varieties which are not injured at all or less than five per cent were Clackamas, Cosford, Daviana, Early Globe, English Cluster, Kentish Cob, Fertile de Coutard, Italian Red, Medium Long, Oregon, Purple Aveline, Red Lambert, White Aveline, White Lambert, D'Alger, Cannon Ball, Duke of Edinburgh, Kentish filbert, Prolific Closehead, Red Skinned, Eckige Barcelonaer, Kadetten Zellernuss, Ludolph's Zellernuss, Luisen's Zellernuss, Kruse, Neue Riesennuss and Rush and Winkler.

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It is evident from this data that although many filbert varieties are subject to serious winter injury, there are still a number to choose from that are sufficiently hardy under western New York conditions.

Variety Notes

The Station variety collection has grown considerably since I discussed filberts before you in 1929. At that time the collection consisted of 28 varieties; today there are under test at Geneva 99 varieties of *Corylus avellana*, five varieties of *Corylus americana*, five Jones seedlings, and six species of *Corylus*, or a total of 115 forms.

Later observations on the original orchard have indicated that the original variety recommendations should be modified. Certain varieties imported from Europe and renamed, or were misnamed when imported, and that have been disseminated by nurseries are apparently identical with certain German varieties recently imported by the Geneva Station. Preliminary observations indicate that some of these recently imported German sorts are worthy of further attention.

Barcelona which was the most productive variety during the first few years has been falling behind in yields the past two seasons. This, coupled with the winter killing of wood and catkins last winter, makes Barcelona a doubtful variety to plant.

Italian Red in 1932 averaged nearly eight pounds of nuts to the tree, the heaviest yield of any variety in the orchard. The crop this year promises to be satisfactory and one of the largest in the orchard, in a season when varieties generally are very light. S. H. Graham of Ithaca reports that "Italian Red has been the best and most regular bearer of any of the European filberts" that he has tried.

Kentish Cob averaged five pounds per tree last year and Cosford over four pounds. The latter variety is catkin hardy and should be in every planting. White Lambert and Red Lambert, still light croppers, possess very hardy catkins and for that reason deserve trial.

Oregon, Purple Aveline, and English Cluster bear heavy crops, but are difficult to husk and the nuts too small for market. For home use they should be very satisfactory.

Among the newer nuts fruiting last year for the first time, Neue Riesennuss, originating in Germany in 1871, is promising. It is one of the largest in the Station collection, is a bright light brown in color with slightly darker stripes, and last winter experienced very little catkin injury and no wood injury. As yet nothing is known of its productiveness in this country, but in Germany it is said to be productive.

Some of the nuts distributed in this country by Mr. Vollertsen of Rochester are proving identical with some of the German sorts recently imported by the Station. I do not intend to suggest now that the name of the varieties in this country be changed to those of the varieties with which they are identical. Later when all of these imported varieties are in full bearing the matter of changing names will be brought to your attention again.

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Red Lambert (of Vollertsen) is identical with Beethe's Zeller, and Italian Red (of Vollertsen) is identical with Gustav's Zeller. Minna (of Vollertsen) is not the Minna of German descriptions.

Filbert Breeding

The breeding work with filberts is following two lines. Hardiness of wood and catkin is of prime importance and to develop varieties satisfactorily in these respects those varieties that have proved hardy are being crossed with different sorts that have desirable nut and tree characters. Hardiness is also being sought by crossing the Rush native hazel with varieties of *Corylus avellana*. 535 trees from this cross, made by Mr. Reed, are now growing in a fruiting plantation at

the Station, and several hundred more from other crosses are in the nursery row. With this wealth of material coming along, it is reasonable to assume that the day is not far distant when satisfactory varieties will be available for northern planting.

Developing a Walnut Grove as a Side Line Job as a Bee Keeper

L. K. HOSTETTER
Lancaster, Pennsylvania

In discussing this topic I shall give you some of my doings in my bee business and nut growing.

About 30 years ago, I started out in the bee business with three colonies of bees. This number increased gradually until I had 170 colonies. During these 80 years I would sometimes have a bumper crop of honey and then again sometimes a total failure. This past summer happened to be one of those off years. It is, however, the income from this bee business that started me off in the growing of a grove of 800 black walnut trees, also a few shellbarks, pecans, heartnuts, English walnuts, hicans, hardshell almonds and filberts.

In the spring of 1926, I had a nurseryman graft 6 small black walnut trees to the Thomas and Stabler varieties with 5 catches, 4 Thomas and 1 Stabler. In the spring of 1927, I bought the homestead farm and planted 2 Thomas, 2 Stabler, and 2 Ohio black walnuts, 2 shellbarks, 2 hardshell almonds and 6 filberts. This spring I also planted about a bushel of seedling black walnuts and, as it happened we had an exceptionally wet summer, these seedlings made a wonderful growth.

In the spring of 1928 I transplanted about 15 acres to these seedlings. In 1929 I planted another 20 acres, and in 1930 another 10 acres. Some of these trees were planted 60 feet each way and some 30 feet apart.

Some of these trees were grafted the same year they were planted but most of them were grafted two years later. At this time I had little experience in grafting and, naturally, my 2 acres in getting catches were accordingly. When I started out I thought it would be cheaper to plant seedlings and graft them, as explained above. I have gotten along fairly well in getting my grove started but I found it to be far more work than I expected it would be and I would not do it that way again. Because of some failures each year I still have many trees that have not yet been successfully grafted. I am not in a great hurry to get my grove on a paying basis as I am getting a lot of fun playing with the developing of it and I don't believe there will be so very much difference in the size of these trees 25 years from now. I would say, however, that for the man who wants to get a nut grove developed as soon as possible, he should buy his trees from the expert nut tree nurseryman.

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My entire grove is now seeded to blue grass for a permanent pasture. About 25 acres is pastured by 160 head of sheep and the balance is cut for hay to feed the sheep in the winter time. My reason for seeding to blue grass is to prevent erosion. Possibly if I should keep my trees cultivated during the summer they would make a better growth. But then my sheep will make quite a bit of manure and I spread much of this manure under the trees every winter and, as it is, my trees are making a very good growth every year.

I now have a grove of about 800 black walnut trees. These are mostly of the Thomas, also quite a few Ohio and Stabler and a few Ten Eycks. The Stablers, Ohios, and Ten Eycks seem to fill the shell so full of meats with me that they are hard to remove in large pieces. I think I shall regraft most of these to the Thomas and some of the later varieties.

About 600 of my trees are now 7 years old from seed. These trees had about ½ bushel of hulled walnuts last summer and I expect to have about 2 bushels this summer. Last summer I also had about a peck of hard shell almonds from my two trees that were planted in 1927. In 1931 my 6 filberts had about ½ peck of nuts. These trees are now big enough to have at least a bushel or two of nuts if the catkins had not frozen this past winter.

Dr. Zimmerman: Mr. Hostetter, I would like to suggest, from the fact that we know so little about pollinization of nut trees, that you do not be in too big a hurry to cut out your odd varieties. Instead why not do this, let them come into bearing and then each year cut the variety out and note if there is any change in the bearing of the Thomas, of which you say your orchard is mostly made up? Should you happen to note a lack of pollinization or bearing in the Thomas the year after a certain variety is cut out, you can then start checking and may find that variety the best pollinator for the Thomas. I certainly would not be in too big a hurry to eliminate all my test varieties if I were you.

The President: Last year Prof. Reed gave us a very valuable paper on pollinization.

Dr. Zimmerman: I have a Taylor hickory at my place and every year it has several nutlets but as soon as they get any size they tumble off. I have never seen any catkins on that tree.

I have been fooling around for several years with persimmons. I have particular reference to the

Nut Trees as Used in Landscaping

DR. LEWIS EDWIN THEISS
Muncy, Pennsylvania

I was asked to speak on the subject of "Planting Nut Trees for Those Who Have Space for Only a Few," but I am going to speak on using nut trees in landscaping. We should know what is meant by the term landscaping. It may mean planting blue spruce or junipers around the house in a pleasing way, or you may use plants. The object is to make a picture which gives a certain impression of our home. We can just as well use nut trees in such a way as to make a beautiful picture, so that when one looks out any window of his home he gets a beautiful picture or vista, or when one goes by and sees your home, he sees a beautiful picture.

We tend to follow too stereotyped ways of doing things. There is no reason why we should make a liability of our property. We can just as well have nuts to help make an asset.

Trees are very much like words. We have two words in the English language that express more than any others. They are "home" and "mother." We also have trees that connote much. Of course, it depends on what picture we wish our homes to convey. I want mine to have a cozy yet prosperous look. Now you ask, "How are you going to produce that look?" It is by the materials you use and how you use them. And you can use any you wish.

We might divide plants into two groups, cultivated plants and wild plants. In trees we have some fruit trees which are never worth a cent. Apple trees suggest home. If you are driving through the woods and come upon an apple tree, you immediately think, "Someone had a home here once." Of course, it might have grown from a chance seed but that is the thought you have at once. The apple tree connotes the thought of home.

I happen to be a fruit tree as well as a nut tree grower. The difference between them is that you have to spray the fruit trees.

Longfellow said, "Under the spreading chestnut tree the village smithy stands." That was probably very true as there were lots of chestnut trees at that time. So we have nut trees that give us this connotation of domesticity. They make us think of home.

We must also consider the foliage. A tree with fine foliage such as the walnut is preferable for the lawn. The walnut gives a fine shade but does not interfere with the growth of grass. The English walnut makes a dense shade, nothing grows under it. Hickory also gives a dense shade. All these things we have to consider when choosing trees to plant about our yards.

In my own grounds I have black walnut, Persian walnuts, pecans, filberts, hicans and some others. I feel we might as well have something around our places to help pay the taxes. We might as well get a little pleasure out of our property. Some of us have vegetable gardens. Nut trees can be an asset to your property in the same way if you will plant the proper kinds.

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You all know the black walnut. It grows to be a large spreading tree but it needs good soil. Another nice tree is the Japanese walnut. This tree is quite beautiful. A sport of this tree is the heartnut. It also is a very beautiful tree and a rapid grower. I have a little group of these trees and I have never seen trees grow so fast. I have a Japanese walnut, a grafted heartnut, and a Japanese seedling. They look exactly alike but bear different kinds of nuts. I have one tree which is a seedling. It is eight years old, beginning on the ninth year and is 20 to 25 feet high. I have a heartnut which is a little bit older which I bought from Mr. Jones. That tree has suffered a lot at my hands. I dug it up twice and changed its position, cutting it back, and still it is growing fine and a big tree for ten years. It has a spread close to 40 feet and reaches to the house top. It certainly looks more than 10 years old. I think a tree like that is very useful planted by a house because of its rapid growth. The foliage is very lovely. I have measured some of the leaves and some are a yard long. Another tree I have growing near the house is a Potomac English walnut. It is a very vigorous tree, has a dense shade and a very good grower. A very lovely tree to have in the yard.

I have also, the Butterick, Busseron and Indiana pecans in the side yard. They bear quite well, particularly the Butterick but I like the Busseron better. I think they are going to be very large trees. I think they will be like the elms in New England. The foliage is not so large and coarse and is a little different from the black walnut. They have been very successful for us.

We do not know much about getting revenue from our trees as we use all our nuts in the family. A pound of nuts I raise myself is worth much more to me than a pound I would buy in the grocery store because of the fun I get in growing them.

I have chestnuts that have escaped the blight so far. They say the Japanese variety is very hardy and very resistant to blight. As to the nuts, I do not know much about them.

Another nut tree that we do not often think of is the beech tree. I have never seen a beech tree that had nuts on big enough to amount to anything.

We have heard a lot about filberts this morning. Filberts make beautiful hedges. I shouldn't advise anybody to grow a filbert hedge along the road or where it would be a temptation to people to steal. But where you wish to erect a screen to shut out an undesirable view, they make a very nice hedge. They are very pleasing as to foliage. We have a very nice crop of filberts this fall. If you have a little place that you want to screen in, why not do it with a hedge that is both beautiful and productive.

We also have a peach almond. That is worth growing just for its blossom. People go to Washington to see the Japanese cheery blossoms but they are no more beautiful than the Ridenhower almond when in bloom. The blossom is 2 inches in diameter. The hull dries and parts through the middle leaving the nut easy to get out. My farmer calls my tree "the dried peach tree." The fruit looks more like a peach seed than an almond. It is more difficult to crack than the usual almond but it certainly is interesting in the springtime. I hope in your landscaping you will make use of nut trees, and when you want a hedge you do not have to have a privet or a barberry one. You can make a hedge of roses or of filberts.

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Dr. Deming: Will your pecans have a good crop? Are they well filled?

Dr. Theiss: Yes, they are well filled and have a very delicious flavor. In the market you could not offer them in competition with the paper-shell variety, but we are quite well pleased with them.

Dr. Deming: Isn't that rather a record for distance north?

Dr. Theiss: I do not know. Mr. Reed, how far north do pecans grow well?

Mr. Reed: I believe our best authorities are Dr. Deming and Dr. Theiss. I am surprised as we have some pecans in Washington with which we were discouraged, although they are now developing.

Dr. Theiss: I must say we have very satisfactory trees and lots of nuts.

Mr. Hershey: About six weeks ago I saw a tree which had been bearing for 40 years. It was at Schuylkill Haven near Pottsville, in the mountainous country where it gets very cold. An old man told me the tree was 60 years old. Imagine my utter amazement since we believed that the pecan would not bear that far north. I showed the old man some Busseron nuts and he stated that his were slightly smaller but very thin shelled. The seed of this tree came from the Wabash in Illinois. He had another tree there about 30 years old which has been bearing for quite a few years.

Prof. Neilson: Have you had any experience with Turkish hazels?

Dr. Theiss: No, I have Barcelona, Du Chilly, Red Aveline, White Aveline, and Jones-Rush hybrids.

Prof. Neilson: It appears that they are very ornamental and very symmetrical and hardy trees.

There is a possibility of using nuts in a new confection made of honey. There is a new method of drying honey perfected by Dr. Philips and Dr. Dyke, and when this is mixed with nuts it forms a really good confection. My wife has worked out several good recipes.

Mrs. Neilson: The new method of drying the honey allows it to be wrapped in wax paper without sticking to the paper. This is quite an advantage in marketing it.

Prof. Neilson: The Broadview Persian walnut is a very ornamental tree and can be grown by those who live very far north.

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My Experience in Growing Nut Trees on the House Lawn

By M. GLEN KIRKPATRICK
Orchard Editor, Farm Journal, Philadelphia, Pa.

Coming at the end of a program such as you have had here today, I am reminded of a story my father used to tell me as a boy.

"There was once a mouse that lived in a cellar. One day he was attracted by some moisture on the floor that was seeping from a barrel of cider. The cider was in the stage of becoming vinegar. The mouse took two or three helpings and then said, 'Now bring on the cat!'"

I would be just as foolish as the mouse if I tried to contribute any technical matter. Ten minutes will be ample to tell you of my experiences.

My interest in nut trees is due to Mr. John W. Hershey. I wish now that some of my apple trees were replaced by walnuts. I planted my trees about 8 years ago. The pecan is about 18 feet high, the English walnut about 12 feet high. The English walnut has blossomed but has never borne fruit. The pecan has blossomed this year for the first time. My Barcelona has about a pound of nuts on this year. It is from 12 to 14 feet high. My Du Chilly has produced fruit one year.

The thing I like about nut trees is their cleanness. My English walnut has never been troubled by

pests, neither has the pecan, except there is one thing I hold against the pecans and that is the borers on the branches. It is ten times as bad as English walnuts. But the trees are clean and nice to have, and I really prefer them to apple trees. With apple trees you are at all times troubled with apples on the lawn and it is a job to keep them cleaned up. You have nothing of that sort to contend with in nut trees.

My trees have not been given special advantages. The pecan is in with a lot of shrubs and the English walnut is surrounded by roses. The filbert has just taken pot luck with the rest.

That is my experience and if I can tell you anything further I shall be glad to do it.

Dr. Zimmerman: I would like to ask you a question about the Japanese beetle. Have you had any trouble with your black walnuts?

Mr. Kirkpatrick: I have had one black walnut die.

Dr. Zimmerman: Do you know if the Japanese beetle attacks the chestnut or chinquapin?

Mr. Shaw: Maybe I can answer that question. In New Jersey the Japanese beetle attacks the chestnut but I do not know about the chinquapin.

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Developing a Thousand Tree Nut Grove

By C. F. HOSTETTER
Bird-in-Hand, Pennsylvania

The natural title of this paper should be "Why I Planted a Nut Grove." Some years ago, especially when we were in the war, it occurred to me that with all the modern machinery and scientific methods on the farm it wouldn't be long before we would be producing much more food than could be consumed, hence the prices for farm commodities would fall so low there would be no profit in them. The last few years have proven my contention was right.

So I got to looking around for something to specialize in and became interested in the new improved thin shelled black walnuts that the late J. F. Jones was introducing. I know there is danger in specializing in any one thing but, in summing up the following regarding black walnuts, it looked to me like as good or better a bet than any thing else. First, we know that the demand for the high black walnut flavor has caused it to be profitable for carloads of kernels to be cracked and shipped to the cities from the natural black walnut belt. Although this seedling product has been somewhat improved in quality the last few years I still feel that the demand for this high flavored nut for home use, in confections and baking and ice cream making, will make a high demand for an improved and uniform meat such as can be produced with the grafted trees. With the growing interest in natural foods, and less animal meat, I believe the demand will increase as our groves come into bearing.

In 1926 I hazarded a planting of 150 trees, the next year I was steamed up to the place where I decided I should plant more, and then each year following, until my last planting this year, gives me one thousand thrifty growing black walnuts, mostly Thomas variety which I think is the best from what I have observed in my own grove.

In planting I set the first ones 50 x 50 ft. Some thought it was too close but I couldn't see it.

The next planting I made 50 x 50 feet and then at the next planting I started to wake up after seeing how rapidly the first ones were growing, and I decided to make them 60 x 60 feet. The last planting I made this year 60 x 60 feet and I would advise 60 x 70 feet to any one who asks me how far apart to plant.

To me it seems queer just why more people don't plant them. On the basis of 60 x 70 feet you could farm indefinitely, with the tree crop coming on and even bearing for many years, while you are contenting your heart growing annual crops to lose money on.

As to bearing, two years ago I had the older planting and many of the younger trees loaded. One five year Thomas had about 400 nuts. Three to five year trees had 50 to 250 and 300 nuts. My crop that year was fourteen bushels which I sold for 15c per lb or \$5.00 and \$6.00 per bushel. Last year I didn't have so many but this year I first said I would have 50 bushels. I'm starting to believe now I was a little high in my guess but many trees are nicely loaded.

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Now regarding cost of carrying the grove, as I'm a sweet corn drier I have the most of my farm in corn. I farmed the grove in corn the first five years and hardly missed the space used for trees. I proved what I stated above that one can plant trees and keep on farming and hardly miss the tree space. If planted 70 feet apart one can farm still more land. In cultivating the corn the trees are cultivated, which cuts down the extra cost of caring for them, although of course one must cultivate them if he expects to have them grow and develop rapidly.

I now have my oldest trees in sod, mostly weeds this year, but I intend to sow it to grass. I expect then to mow it early in June and use it for a mulch and then mow it maybe a couple of times more for looks sake and let the grass lie.

Now another interesting point I want to present to the intending planter of a nut grove is the error of following the foolish advice given out by some of planting seedlings and then grafting them. I say this not for the benefit of the nurserymen but for the financial benefit of the planter. First, the grafting of nut trees is a highly technical job and requires an enormous number of moves, from the first thing of cutting the grafting wood at the proper time in the winter and carefully storing it, until the cutting off of the stocks and knowing how long to let them bleed, and then grafting at the proper time, the proper shading of the graft, sprouting, staking, and tying up of the rapidly growing graft until the end of the growing season, so that the average man will have fallen down long before the season is over. And even if he has the time to do this, which the busy man hasn't, it will take him several years to learn to graft. By the time he has his legs run off over a period of five or seven years going from tree to tree set 60 or 70 feet apart doing more duties than he ever thought were needed, he will have a spotty grove of trees from one year old to bearing age, and then he will wake up and find that the first grafted ones are bearing so well, that should he have bought grafted trees and set them all out at one time the crop would have paid for the complete planting and he would have saved the long agony of trying to get a grove started. Even then he might not have one started, for grafting nut trees is a job every body does not seem able to grasp.

At the same time I feel that everybody who has a planting should learn the art of grafting. The few nurserymen now growing grafted nut trees are very willing to teach you and it is nice to be able to turn the fence row seedlings into profitable trees, it's nice to have the kick of feeling you can develop a wonderful tree with your own hand. And again, although I have had, I would say 95 per cent of my planted trees to grow, still here and there a top will die and suckers come up. As the tree roots are established it's nice to be able to stick a graft on these and save waiting a year to replant them with nursery trees.

In closing I wish also to suggest that, in making a large planting of black walnuts, plant a few pecans, hickories and any other good trees recommended by the nurserymen. They are all ornamental and bear fine nuts for home use and maybe local trade. If any wish to ask questions I will attempt to answer them now. And don't forget to come up to see my place on the bus tour tomorrow as I shall be very glad to welcome all and have you learn anything you can from what I have done and mistakes I have made.

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Please bear in mind that in every move we must remember that this is a new industry of the soil and, although we believe it has a great future, all growing procedure must be felt out and experimented with as we have no guide to go by, just ideas, and you can expect to make some mistakes. But that is life.

The President asked Dr. Deming to speak of the death of Mr. Bixby.

Dr. Deming: On August 16th not a single member of this association, so far as I know, was aware that Mr. Bixby was even ill, and yet on that day he was dead. Mrs. Bixby has written me an account of his illness and his life. He had pneumonia in March from which he never fully recovered. The cause of his death was not known until after his death.

I knew Mr. Bixby very well and came to appreciate his very sterling qualities. He was always willing to take any amount of trouble and spend any amount of money on his nut culture experiments.

I will now read Mrs. Bixby's account of his life.

Willard G. Bixby was born July 13, 1868 at Salem, Massachusetts, the son of Henry M. and Eliza (Symonds) Bixby. In 1898, he married Genevieve Cole who died in 1901. He married second, Ida Elise Tieleke who survives him. His early education was received in the public schools in Salem and, after graduation from high school, he entered Massachusetts Institute of Technology from which he was graduated in 1889 with the degree of S.B. and the highest honors. After receiving this degree, he remained at the institute as an instructor in mechanical engineering, later becoming associated with the Pneumatic Dynamite Gun Company of New York, following which he became connected with the American Bell Telephone Company of Boston. In 1891, he entered the employ of S. M. Bixby and Company, manufacturers of shoe blacking. The firm became involved financially in 1895 and until 1898 was conducted by a receiver. Mr. Bixby interested capitalists and organized a corporation to take over the business of the old company. Mr. Bixby was elected treasurer and held that position until 1911, when he was chosen vice-president. He paid special attention to the manufacturing department. Under the new management the company met modern trade conditions and the business which developed was one of the largest and most prosperous in this line in the country.

Following the merging of the Bixby firm with the makers of the 2 in 1 shoe polish, Mr. Bixby retired from that business, and devoted his time to the propagation and cultivation of nut trees. On his Grand Avenue property in Baldwin, where he resided, he had gathered approximately 1,000 trees of almost every variety from all over the world. His experiments in grafting and in crossing varieties, were subject of several articles in national magazines and newspapers. One article, under the title of "Growing Timber for Profit," appeared in a recent issue of the American Forests. He was also interested in

curly black walnut and birdseye maple woods. His latest experiment on which he was working at the time of his death was rooting hazels from leaf cuttings, and at this he was partly successful. Mr. Bixby was deeply interested in civic affairs. He was a charter member of the Baldwin United Civic Association, trustee of the Baldwin Public Library, director of the Baldwin Savings and Loan Association, former Fire Commissioner, chairman of the Baldwin Lighting Commission, member of the Methodist Episcopal Church in Baldwin, and organist of the Men's Bible Class, as well as a teacher of the Sunday School. Mr. Bixby's conservative New England training made him a valuable worker for any cause he espoused. He never sought honor and publicity, rather preferring to do his share quietly and modestly. Besides his wife, three children survive him, Willard F., a student at the Massachusetts Institute of Technology, Katherine E., just recently graduated from the Baldwin High School, and Ida T., still at the Baldwin High School.

The President: I will also call on Dr. Smith.

Dr. Smith: Mr. Bixby had a great many fine qualities, but first of all he had that great characteristic, intelligent inquiry. He had great persistency and great industry, and a wide-awake mind.

Now the average American has no interest in anything but his job and his own particular pleasures. In other words, he has no avocation. We are here because we have the avocation of nut growing. One of the most interested members of this association was Mr. Bixby. He had applied to it his great brain and statistical equipment. He might have had a yacht or spent his money on race horses, but instead of that he picked out something new. It is a great pity that his life had to be snuffed out just when he was needed most. He used his spare time in having a useful avocation.

On motion of Prof. Neilson the organization expressed its appreciation of Mr. Bixby by rising and standing one minute in tribute to his memory.

At the suggestion of Mr. Reed the following night letter was sent to Dr. Morris who has been confined to his home for a long time and has not been able to attend the conventions.

Downingtown, Penn.
Sept. 11, 1933

Dr. Robert T. Morris
Merribrooke Farm
Stamford Conn.

The Northern Nut Growers Association in convention at Downingtown, Pa., sends you its affectionate greetings. Your long years of association with us and your priceless service to the association and to nut growing and the gracious charm of your presence have so endeared you to us that our meetings are quite incomplete without you. We pray for your speedy restoration to health and return to our councils. Northern Nut Growers Association

The meeting was then adjourned to Mr. Hershey's nursery and nut grove and the members and visitors were privileged to inspect his large stock of nut trees and plants and the specimen plantings, some of which are very rare varieties. A delicious supper was then served by Mr. and Mrs. Hershey on the lawn of the Hershey home. Those present expressing their appreciation by a rising vote of thanks.

A Black Walnut Grove and Why

By DR. F. L. BAUM
Boyertown, Pennsylvania

I will give you the "why" first. Early in 1923, we realized the need of a diversion, something which would take us out into the open every day of the year and bring us closer to nature, which would be a source of pleasure with prospects of a material return in the future when I wish to retire from the active practice of medicine. After investigating several projects, we finally decided that a black walnut grove would best meet our needs.

In the December issue, 1925, of the American Nut Journal, I read "Eventually, why not now?" In that article, Mr. T. P. Littlepage said: "The time will come when the northern states will produce big groves of nut trees." The Journal's comment was "What are we waiting for?" I too wondered because, long before the trees had leaves, I had visions of them bearing to the extent of breaking the limbs from the weight of nuts.

When this picture was taken, I asked myself this question, "Was it a venture of fools rushing in where angels fear to tread?" Also I began to think that the quotations in the article I read were sales propaganda put forth by high-pressure salesmen. Encouragements came later when we

discovered thirteen nuts on this tree and when my grafts grew on seedlings.

About this time pests came such as caterpillars, rose chafers, leaf hoppers, bud worms and, now my worst enemy, a borer which I believe is a cherry tree borer. I have placed a section of a tree on the table which was attacked by this insect. The question has been asked if it were not a blight canker which killed this tree. When I noticed the tree in distress the leaves were drooping and the bark was intact and smooth, with a wet spot the size of a pin point about three feet above the ground. A stab wound revealed the bark loose and full of holes which extended into the sapwood. All of our trees have been treated for the destruction of this pest. Next Spring they will receive a second treatment. By this method we will overcome our difficulty.

In July of this year my men who were picking caterpillars came with this information, "There is no necessity for hunting caterpillars as there is a fly stinging them." The insect, the size of a wasp, is part black and part yellow.

In the evening they said that if some of the trees in the backfield were not propped, they would break down due to the pressure of so many nuts on them.

(Lantern slide pictures of individual trees were then shown and described by Dr. Baum.)

The vision I had a few years ago is becoming a reality. I now wonder if it might not have been a case of angels rushing in and other fellows staying out. We may conclude "Now, not eventually."

Question: Do caterpillars give you any trouble?

Dr. Baum: Yes, they give me considerable trouble. I sprayed this year with arsenate of lead. For a few years I burned them off but last year I sprayed. [Pg 48]

Question: Do seedlings come up?

Dr. Baum: A few, I mow them down.

Dr. Smith: I want to talk to you about the possibility of making some small cash contributions next summer for a nut contest. We have not had any contributions for a nut contest for some time and it is the only way we can get any new varieties. I would like to start this nut contest next September. It will be necessary to get a lot of people interested and a lot of publicity in the newspapers. We could give a first prize of \$25.00, some \$5.00 and some \$3.00 prizes. It means we would have to have \$60.00 or \$75.00.

Perhaps we can make a more definite call next September.

Dr. Theiss: I would like to get any information that is available on the pollinization of filberts. The difficulty seems to be in getting pollinators.

The President: There is full information on that subject in the bulletin issued of Prof. Slate of the Geneva Experiment Station.

Prof. Slate, what can you tell us about it? Have you any information other than what was published in that bulletin?

Prof. Slate: We have this difficulty, that the pollen bearing catkins seem to ripen very early and then the first cold snap freezes them.

Dr. Smith: I would like to know something about the market for shagbarks and if the market is for cracked nuts.

The President: There is a very small market for them in Cleveland, Ohio. Is there any information about hickory nuts?

Prof. Neilson: Hickory nuts frequently sell for about 10c a pound, sometimes as low as three pounds for a quarter.

After the discussion closed three telegrams were read, from the Kellogg Hotel, The Agard Hotel and The Chamber of Commerce of Battle Creek, Mich. inviting the association to hold its next meeting in that city. A motion was unanimously adopted to hold the next convention there September 10th and 11th, 1934.

Motion was made to give Mr. Z. H. Ellis a life membership in return for his contribution of \$50.00. The motion carried.

Miss Sawyer: Is the mollissima chestnut blight proof?

The President: I should like to have Dr. Smith answer that question.

Dr. Smith: The mollissima chestnut came from China where it has been exposed to the blight for ages. It is blight resistant but not blight proof. An occasional tree gets the blight and dies; an occasional tree gets the blight and recovers. It is the opinion of Mr. G. F. Gravatt, of the United States Department of Agriculture, that the physical prosperity of the tree has much to do with its ability to throw off this disease. For example, some of the trees at Bell, Maryland, got to be a foot in diameter and bore crops, without any sign of blight until the terrible drought year of 1930

when some of them developed blight and then later recovered from it. I think mollissima chestnuts are less likely to die than cherries or peaches, and probably less likely than apples.

While the subject of blight resistance in chestnuts is up, I should like to call attention to the fact that there are many Japanese chestnuts in the eastern part of the United States that have survived the blight. Some of them bear good nuts, very good nuts, although most of the Japanese have a properly bad reputation for flavor. Doubtless an experimenter has a chance of producing something very valuable by breeding from the best blight resistant Japanese chestnuts now surviving in the eastern United States.

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Green Shoot Grafting of Trees

By ROBERT T. MORRIS, *M. D. New York*

In the course of experimental work with trees I grafted scions of several species and varieties into stocks of their respective genera at times of the year when grafting is not commonly done.

Scions were taken directly from one tree and placed at once in another tree. To this method I gave the name of "immediate grafting" in order to distinguish it from grafting with stored scions which might be called "mediate grafting" indicating the intermediate step of storage. Immediate grafting was successful in mid-winter in Connecticut but I had no thought of making it a practical feature of our work beyond the recording of a research fact.

Immediate grafting was successful in mid-summer in Connecticut. The procedure was very different from that of winter grafting. In summer the new green growth of the year was cut away completely from a scion and the remaining wood of one or more previous year's growth was depended upon for sending out shoots from latent buds. That is what happens after accidents to limbs or to trunks of trees and it occurred in the same way with my scions. Furthermore, it seemed to offer new hope for the propagation of walnuts, maples, and grapes, for example, because the free flowing sap of such species in the spring and early summer has led to attacks upon the sap by bacteria and fungi which ruin repair cells.

I have already published elsewhere the statement that immediate grafting may be done in the way described in any month of the year with many kinds of plants. Exceptions to this rule will doubtless appear here and there. For example, the grafting of trees in August would not be safe in Connecticut because the new young shoots would be killed by September frosts. That is the reason for August cutting of brush by farmers. The tender new shoots that are sent out from latent stump buds become frosted and the entire plant may die.

On account of an illness that had kept me confined to the house most of the time for some months, I had allowed the spring grafting season to pass this year. Stored scions of many kinds lay under a heap of leaves at the rear of my garage. The drying-out process had been intensified by an employee who made a spring clean-up of the yard and who looked upon this heap of leaves as something upon which creditable showing for his work might be made. A month or so later I kicked over the few remaining broken remnants of scions for no reason in particular. Down near the ground I observed that two hybrid chestnut scions which had been trampled into the ground had retained some moisture. Each one had sent out a pale canary-colored shoot of the sort with which we are painfully familiar. The shoot on one scion was about an inch and a third in length with well-formed unfolding sickly yellow leaves. The other scion had a shoot of the same kind but only about one-third of an inch in length and with yellow leaves barely out of bud-bursting form. It occurred to me that my old method of waxing the entire scion, leaves and all in this case, might be done as an experiment in order to see how long these greatly started shoots would hold up if desiccation was prevented and always with the possibility of a surprise.

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Some years ago I had waxed some hazel scions from the West that had burst their buds and they all grew but the test was by no means so severe as it was with these yellow chestnut upstarts. The rule of discarding scions that are not wholly dormant was about to be rudely broken; waxing changed the whole situation. A miser does not scrutinize his treasure more acutely than we horticulturists do when getting out scions that have been stored during the winter and the voice of Demeter is calling us to the side of our own wards. How sadly a million nurserymen have thrown away a billion started scions of valuable kinds. My two chestnut scions had gone far beyond the hopeless stage but now perhaps I could be a doctor to them. If my two canary birds could be made to sing then would I also sing.

They were dipped in a dish of melted paraffin wax for an instant and then quickly shaken in the air before scorching could occur. The scions were then grafted into a small chinquapin stock. A few days later one of the larger leaves of the larger shoot had cleared itself from the wax coating and had begun to expand widely, turning to a natural green color. The stem of the shoot turned to a normal brownish red. Two tiny shoots then broke through the wax of the larger shoot, looking like axillary bud shoots until closer examination showed them to be scale bud shoots. That should interest plant physiologists. Eventually the cramped leaves remaining under wax coating that was unnecessarily dense finally dropped away useless. The single green leaf and the two scale bud shoots went on to natural development. The smaller shoot of the other scion managed to burst through the wax completely and made normal growth.

After these scions were well under way I went out and searched in the loose dirt and leaves of the old heap and found another hybrid chestnut scion that presented the allusive emblem of a canary bird. This one had a shoot of about half of one inch in length and it burst completely through the wax, to make a fine little twig.

So much for an experiment that led immediately to one of far greater importance. If canary bird shoots could be made to break rules of horticultural theory and of recorded fact perhaps we might note the principle and apply it to the experimental grafting of green shoots of the year in tree propagation. This is what lawyers might call a *non sequitur*. Such grafting had always been a failure so far as I knew, and certainly my own attempts had failed in former years. Grafting of new growth of the year upon new growth of the year in the growing season is an established feature of horticultural experiment with certain annual plants. Why had it so signally failed with perennial plants and most impressively with trees? Doubtless plants produce in their leaves a hormone which directs certain enzymes that conduct wound repair by cell division. If plants which do not lignify for winter manage to direct successful wound repair after grafting and if plants which do lignify for winter do not conduct successful repair of grafted new growth it occurred to me in a speculative way that the reason might perhaps be sought in the nature of the two different kinds of hormones or of enzymes belonging to annuals and to perennials respectively. The difference might possibly depend upon the arrangement of ions, anions and cations upon two sides of the permeable membrane of a repair cell. The cell is an electrolyte and therefore division of the cell in course of preparation for multiplication might perhaps depend upon an electric impulse so delicately in balance that Nature for some cryptic reason might prefer not to allow the necessary balance to go toward cell division in grafts consisting of green growth of the year in perennials. Perhaps I might defeat natural processes by leaving a leaf or part of one at the distal part of a green graft shoot. This leaf might perhaps elaborate the necessary hormones or enzymes for wound repair purposes—and also for conducting polarity of sap movement toward maintenance of that scion and leaf.

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We need not speculate further upon the philosophy of the subject because I took it up at this point for pragmatic tests experimentally. The horticulturist does not have to go to the theatre for thrills. My advance report at this moment comes at a time when a scientist would demand more works along with faith and my only reason for presenting incomplete notes at this time is that they seem to be fascinating in their outlook and no one knows how much experiment may be permitted me for next year at Merribrooke.

The summer was well along when my canary bird shoots opened a vista. The vista appeared at a time of drought when plant propagators wait for better days. It seemed to be necessary to get in a part of the work at least on July 28th and we then had the drought intensified by five more days of great heat, temperatures ranged above 90 degrees F. in the shade and above 140 degrees F. in the sun. After this period of heat and drought we had abundant rains. All grafts were wax treated in these experiments. In no case was an entire leaf left at the distal end of a graft because it was felt that even one-fourth of one leaf would attend to the required functions.

Exp. No. 1. A growing persimmon shoot about two feet long was cut up into scions with a few buds each, and about one-fourth of a leaf allowed to remain at the distal end of each scion, other leaves on each scion being snipped off. Each scion including its remnant of leaf was dipped in melted parapin wax. Two of these were grafted upon green shoots of another persimmon, the latter cut back to make stubs for reception of cleft grafts. Three of the scions were inserted in bark slots in older wood. Note, Sept. 9th, Green leaf part including its petiole had dropped off from all five scions. A small slit in the bark of each graft for investigation showed that the cambium was green in four grafts, the fifth graft was completely dead.

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Exp. No. 2. On July 28th three persimmon scions consisting of last year's wood and each one carrying a couple of inches of new growth with a terminal trimmed leaf were grafted into last year's wood on another persimmon tree. Note. Sept. 9th. All three grafts dead including both old and new wood.

Exp. No. 3. July 28th. One green persimmon scion with terminal leaf inserted in bark slot of branch one inch in diameter cut back for purpose. Note Sept. 9th. Dead.

On August 2nd the drought had been broken. All trees seemed to have put up top buds on account of drought and heat. The following experiments were made with green growth of the year but with new top buds much to my regret at having no actively unfolding shoots for furnishing scions.

Exp. No. 4. Aug 2nd. Persimmon tree (a) One graft, green on green; one green graft on old wood. Note. Sept. 9th. Terminal leaves remained green several days after grafting but by Sept. 9th all had fallen off. Small slit in bark showed cambium of grafts still green.

Persimmon tree (b) Two green grafts on green. One green graft in bark slot of older wood. Note Sept. 9th. Terminal leaves had finally died but two of the buds of green graft on green have burst forth into leaf. These will probably winterkill. Green in old wood has green cambium but no swelling bud.

Exp. No. 5 Aug 2nd. Persimmon tree (c) One green on old wood. Sept. 9th. Leaf dead, cambium of stem green.

Exp. No. 6. Aug 2nd. Persimmon tree (d) One green on old wood. Sept. 9th. Leaf dead, cambium of stem green.

Exp. No. 7. Aug. 2nd. Persimmon tree (e) Three greens on old wood. Sept. 9th. Leaves dead, one stem dead, cambium of two stems green.

Exp. No. 8. Aug. 2nd. Papaw tree. Two greens on green, two greens on old wood. Sept. 9th. Two greens on green have buds enlarged and ready to burst. One green on old wood is not enlarging its buds. One green on old wood is dead.

Exp. No. 9. Aug. 2nd. English walnut. Four greens on green. Sept. 9th. Leaflets dead on all. Petiole dead on one, stem cambium green. Petioles bright green on three and the cambium green on these.

Comment. I could not take daily notes which would have been very important. A general statement will cover the point that the terminal leaf on a scion seldom died until it had functioned for at least a week. Some of them functioned for more than two weeks and one of them for at least four weeks, failing only a day or two ago. This would seem to mean that the terminal leaves in scions conducted or helped to conduct repair in green graft wounds to a point where buds are now bursting on two persimmon scions. Two pawpaw scions have enlarged buds to the point of bursting. The terminal leaves on scions seemed to conduct repair up to a point where lignifying for the winter is now going on. This cannot be determined until winter passes but I have never obtained anything like this effect until experimenting with the terminal leaf theory for the first time this year. The most striking effect so far as appearance goes is with the English walnut grafts with their bright green stems.

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If I may have opportunity for conducting experiments next summer I shall begin earlier by pinching off the buds of growing shoots, giving them a week of rest and then cutting these shoots up into scions. If buds then start off like those of two persimmons and two papaws they will have time for lignifying.

My whole lesson of this season would seem to mean that after properly checked experiments we may perhaps add what I call "green grafting" to the other form of immediate grafting. The practical feature of this whole new phase in grafting method is an extension of the grafting season to include every month of the year. Scion grafting of perennials in the latitude and longitude of Connecticut had formerly been confined to about two month's in the farmer's rush season, and with general failure in the grafting of some species which may now be grafted successfully.

Letter from Prof. Colby

Agricultural Experiment Station Urbana, Illinois

I regret very much indeed that I cannot attend the meeting of the Nut Growers Association this year. This letter bears my very best wishes and hopes for a successful meeting. We shall miss Mr. Bixby's pleasing and helpful personality. Some time ago I promised to give you a report on some of our activities here and if you think it is worth while, I would appreciate your reading it to the group.

There is an increasing interest in nut culture in Illinois. Wholly aside from the commercial aspects which have been so profitably developed in southern Illinois is a project of recent development, one in Extension work in top working seedling walnuts and pecans with improved varieties. This project is sponsored by the Department of Horticulture, University of Illinois, and the Extension Forester of the State Natural History Survey, with the cooperation of the County Farm Advisers.

Last fall in Gallatin County native pecans of the best grades sold for 18 cents per pound on the market, while the average tree run stock was bringing six cents. With a native pecan crop from one county in Illinois, more or less ungraded, selling for \$100,000 in a recent year, thinking horticulturists in the state are beginning to feel that there are potential profits in nut culture where better varieties are planted or top worked. Seedling trees for top working are already growing in abundance in many sections of the state with an ideal climate and soil for northern nut production.

Last year seven counties in Illinois carried on the top working project. This year approximately three times that number have been enrolled. In addition, groups from neighboring counties have been present at the demonstrations. Growers from Iowa and Indiana have also attended. The total attendance has run into the hundreds, both men and women, most of them actual growers.

All the meetings are held out of doors in the orchard or nursery and the group is instructed in the propagation of nut trees through grafting and budding. Nut growers of the immediate locality are glad to assist with the work. After the discussion and demonstration, all present are invited to learn how to do the work by actual participation and many become sufficiently skilled to top work their own trees upon their return home. Possibilities of this type of extension work are almost unlimited.

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Letter from J. U. Gellatly

I enclose a short chart or graph of the flowering habits of some of my leading walnut trees. I started in 1930 to keep a record of some of the trees and have added a number since till this year when I kept a record of 17 different trees. The ones shown cover the full time from May 12th to June 25th.

Some new ideas in budding procedure that may be of value and interest I also include herein that others may test them out as I am doing. But even if they fail with me it will not prove that they have no value, for the generally approved methods have failed to give commercial results here.

My main idea was to try to find a new system of handling the budding operations that would give more definite results and if possible to eliminate the use of a wax melter and the waxing of buds. My first trial consisted in the use of florist's tin foil. Cutting bud from bud stick with my new style bud cutter, I cut out the patch from stalk and placed bud in place and with two or three turns of raffia, or rubber bands, secured bud in place, then put 2 wraps of tinfoil around the bud and stalk extending from one inch below to one inch above bud, then with hand pressed tinfoil tightly to shape of bud and stalk, then completely wrapped with raffia and tied securely. This makes a neat job and is pleasant and convenient to work with.

I have today examined some buds so treated and put on the 13th of August and they appear to be in prime shape, no apparent flooding or souring of the bud patch. As this tin foil cost me 25c per pound, I had a happy thought of using cellophane which is much cheaper and is equally easy to use, on the whole, as the tinfoil as, while it is in the first operation of actually applying to stalk not just as easily put on, it has an important advantage that offsets this, which is the ease with which one can see that the bud is in the exact place, while the tying is taking place.

My present method of using the cellophane is to apply a double wrapping of cellophane directly over the bud then to securely wrap from one-half inch below bud to one-half inch above bud. This makes a good air and moisture proof job. Experience may modify or eliminate some parts of this procedure, and it is with this in view that I pass this on that others may take it up and work out the best procedure from a wider experience than one can give.

From my experience I would suggest that if one is marking or cutting the patch on the stalk 8 or 10 days ahead of placing the bud thereon, that one be very careful not to cut too deeply as a large percentage of those I so cut were so badly discolored that I had to cut a new place when placing the bud, as those done 10 days previous showed a one-eighth inch dead and discolored portion around the cut that extend one-sixteenth inch into the trunk of the tree, and no union could possibly take place on such a spoiled cambium surface.

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Bus Tour September 12th

***By J. W. HERSHEY
Downington, Pennsylvania***

Leaving the Hotel Swan at 8:45 A.M. with a bus load and 8 cars the tour proceeded to Dr. Truman W. Jones' grove of 800 trees, 4 and 6 years old, 6 miles west of Coatesville on the Lincoln Highway. Dr. Jones has continually farmed his land which has helped greatly to carry the planting.

The next stop was at the nursery of the late J. F. Jones, now operated by his daughter Mildred, south of Lancaster. Here we saw the interesting test orchard of English walnuts, pecans and black walnuts. Most interesting was the test block of hybrid filbert-hazels started by Mr. Jones some years ago.

The next stop was at C. F. Hostetter's 1,000 tree grove at Bird-in-Hand, east of Lancaster, where we saw what Mr. Hostetter told about in his paper yesterday. His trees all looked nice and many trees were well loaded with nuts.

Next stop was at L. K. Hostetter's grove of 800 trees near Oregon. Here very interesting observations were made in tree and grove procedure. Part of the grove is now in blue grass and sheep, making a very beautiful setting. Part is interplanted with locust trees, the idea being to feed the ground with a legume tree and get something in return from the wood. As the locusts crowd the walnuts they will be cut.

Demonstrations were given in hulling walnuts with a Ford car which was done by jacking up one rear wheel. A trough is inserted under the wheel lined with a piece of truck tire. A mud chain is put on the wheel and as the wheel revolves, nuts are poured in via a metal chute and the nuts fly out the other end very well hulled. The jack is used to adjust the wheel to different sizes of nuts.

Lem's next eye-opener was a brand new method of separating the hulls from the nuts. Two 2-inch pipes are laid on an incline the thickness of a walnut hull, about a half inch, apart. The pipes revolve and the hulls and nuts are poured on at the top. As they roll down the incline, and the rolls revolve, the hulls are caught by the rolls or pipes and pulled through the crack between them. A most remarkable and simple method solving one of the major problems in commercial

walnut growing.

The last stop was made at Dr. Frank Baum's grove at Yellow House, 8 miles east of Reading on the Boyertown highway. Here luncheon was served by Dr. and Mrs. Baum, the outstanding feature being walnut ice cream and walnut kisses.

After the luncheon at Dr. Baum's the following business was transacted:

Dr. Deming, Chairman Nominating Committee, presented the following nominations:

President	Frank H. Frey
Vice-President	Dr. G. A. Zimmerman
Secretary	George L. Slate
Treasurer	H. Russell
Newton	

On motion duly made and carried these officers were elected by acclamation.

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Motion was made, seconded and carried that the annual dues be \$2.00 same not to include a subscription to our official journal the National Nut News.

Motion by Mr. Reed was seconded and carried that where the member wished to do so one check could be submitted to our treasurer to cover both dues and subscription to the official journal and the treasurer will remit the subscription to the National Nut News.

Mr. Reed then explained for the benefit of those present the arrangement whereby our association is affiliated with the American Horticultural Society and by maintaining its membership in that society each member of our association may secure a membership in the American Horticultural Society on payment of \$2.00 dues per annum instead of the customary dues of \$3.00. Each member of the society receives the National Horticultural Magazine of which Mr. Reed is the nut editor. The magazine is issued quarterly, at present, and it is the intention to have one or more articles on nut trees in each issue.

On motion by Dr. Smith, duly seconded and carried the board of directors are required to authorize a budget of expenditures for each year and this was fixed at \$350.00 for expenses for year ending September 10th, 1934. The President to advise the officers each year of the sums appropriated for certain expenses.

On motion by Mr. Russell, seconded by Dr. Weber and carried, article two of the by-laws was revised to cover the proper dues for various memberships and will be so recorded in the by-laws on page 9.

On motion by Mr. Hershey, seconded by Dr. Weber and carried it was agreed that five copies of each annual bulletin be mailed by the secretary or the person in charge of printing the bulletin to each officer for distribution as he sees fit; and that one copy of the bulletin be sent gratis to each non-member who participates in the program at our annual conventions.

A rising vote of thanks was given Dr. and Mrs. Baum for the delectable luncheon served by them.

An inspection was then made of Dr. Baum's 1,200 tree grove. Many trees were loaded and all looking good. Here two cultural problems were discussed. Relative to the walnut blight, he showed us one tree that was afflicted near the ground and he started to mound soil around it. After three years of increasing the mound it is now 2½ feet high and the tree is thriving and bearing, with every indication that it has overcome the disease. Opinion was expressed that it threw out new roots above the wound to save itself. The experiment is of immense value to orchard procedure.

In observing a few of such trees opinion was expressed that in walnut orcharding, as in fruit orcharding, there will be a few trees that will have to be replaced the first few years and is something not to be worried about. Dr. G. A. Zimmerman said, "Why worry about the blight? The wild ones have always had it to a small extent. Spread is so slow it isn't perceptible, damage being almost nil, so let's forget it."

Banquet Tuesday Evening September 12th

The convention closed with a banquet held in the private dining room of the Swan Hotel. On request of the President Mr. John W. Hershey introduced the speakers of the evening. Rev. G. Paul Musselman spoke briefly and was followed by the after-dinner speaker, Mr. Al Bergstrom, Superintendent of Police of Coatesville, Pa. His subject was "Nuts—I Crack Them as You Like Them," and with many interesting jokes and humorous stories he portrayed an interesting picture of the many problems that have to be met and solved by police officers. Each one privileged to hear this forceful speaker was deeply impressed with the responsibility that goes with citizenship.

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Business Session

The President: We will now hear the report of the committee on Hybrids and Promising

Seedlings.

Dr. Zimmerman, Chairman, gave an oral report calling attention to some of the more important hybrids and new seedlings described by other members during the sessions of the convention and concluded by stating that the most important step in testing hybrids was to have interested people plant a number of promising hybrids of hickories and black walnuts and keep accurate records of these seedlings (second generation hybrids). There was some discussion as to whether the Norton was a pure pecan or a hybrid. Mr. C. A. Reed stated he had seen the parent tree himself and believed it to be a pure pecan. Mr. J. W. Hershey stated that he believed it to be a hican, basing his opinion in part on its showing hybridity as it is such a strong grower. He said he had a number of Norton trees in the nursery and would be glad to sell them at a nominal price to those who would be interested in testing them further.

The President: We will now have the report of the resolutions committee.

Report of the Resolutions Committee

Be it Resolved:

That we express our appreciation of the generosity and public spirit of Mr. W. K. Kellogg in making possible one of the largest experimental projects in nut culture in the northern United States.

That we express our sincere thanks to Mr. and Mrs. Hershey and Dr. and Mrs. Baum for the delicious luncheons served our members and guests.

That we express our sincere thanks to the Swan Hotel management and to the citizens and business men of Downingtown for accommodations and services rendered: to the program committee and committee on local arrangements for the very complete plans and their efficient execution; to the speakers who have taken part in the program; to the exhibitors and to the officers and members who have provided a most interesting and educational program and to Messrs. Hershey, L. K. Hostetter, C. F. Hostetter, the Jones Nurseries and Drs. Baum and Jones for the privilege of inspecting their nut tree plantings.

And we again express our regrets that Dr. Morris could not be with us and trust his health will improve.

That we express our sincere thanks to Mr. O. C. Lightner for the efficient manner in which articles and papers submitted by our members were published in our official journal, the "NATIONAL NUT NEWS," and for the excellent printing of our annual report.

We wish to express our deep sorrow over the loss of our faithful member, Past President and Secretary, Mr. Willard G. Bixby whose passing was so touchingly referred to in our business meeting.

Resolutions Committee,

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Prof. James A. Neilson, Chairman
Dr. Harry R. Weber
Frank H. Frey

A motion was made and seconded to accept the report of the Resolutions Committee. (Carried unanimously.)

Professor A. C. McIntyre of the Pennsylvania State Forestry Service was then called upon and discussed the black walnut as a timber tree. He called attention to the fact that the black locust is a legume of high value and acts as a stimulant to the growth of other trees and are themselves excellent for use later as fence posts. In considering the relative value of various nut trees as shade trees he stressed the fact that the time of leafing out in the spring and the dropping of the leaves in the fall are important factors.

Motion was carried that the board of directors should formulate requirements for Honorary membership and have a proposition ready for discussion at the 1934 convention.

List of officers and committee members was then read. Same are recorded on pages 3 and 4.

The President: Attention is called to the fact that the annual dues are now only \$2.00 and surely there are a large number of people interested in nut tree growing who will wish to join our association. I am sure each member will wish to subscribe for our official journal, the NATIONAL NUT NEWS, the subscription price of which is only \$1.00 per year (in the United States) and remittance may be made through our Treasurer or direct to the News at 2810 South Michigan Ave., Chicago.

Those who desire to secure budded or grafted nut bearing trees will have their orders given proper attention by any of the following who are members of our association:

W. R. Fickes, Route 7, Wooster,
Ohio.

Gerardi Nurseries, O'Fallon, Ill.

John W. Hershey, Downingtown,
Pa.

Indiana Nut Nursery (J. W. Wilkinson,
Prop.), Rockport, Ind.

J. F. Jones Nurseries, Box N. 356,
Lancaster, Pa.

Michigan Nut Nursery (H. Burgart),
Rt. 2, Union City, Mich.

E. A. Riehl Farm and Nursery,
Godfrey, Ill.

Snyder Bros., Inc., Center Point,
Iowa.

Sunny Ridge Nursery (Dr. J.
Russell Smith), Round Hill, Va.

W. G. Bixby Nursery, 32 Grand
Ave., Baldwin, N. Y.

J. U. Gellatly, West Bank, B. C.,
Canada.

The Living Tree Guild, 468 Fourth
Ave., New York.

The latter has distributed a great deal of information on northern nut culture and I think a paper at our next convention outlining its work and accomplishments would be most valuable.

Each one present is cordially invited to attend our convention next year, September 10 and 11, 1934 at Battle Creek, Michigan.

As there is no further business, this the 24th Annual Convention of the Northern Nut Growers Association will be adjourned.

The Convention adjourned at 9:00 P.M.

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EXHIBITS

By Clermont Co., Ohio

Hill hickories.

By Dr. Deming

Metal tree labels.

By W. R. Dunlap

Japanese walnut.

Heartnut × butternut cross.

Seedling English walnut.

By F. H. Frey

Black walnuts:

Hillabolt, from Mrs. C. W. Freel, Pleasantville, Ia.

Marion, from Mrs. C. W. Freel, Pleasantville, Ia.

Metcalf, from Mrs. C. W. Freel, Pleasantville, Ia.

Wheeling, from Mrs. C. W. Freel, Pleasantville, Ia.

Worthington, from Mrs. C. W. Freel, Pleasantville, Ia.

Kettler, from Fred Kettler, Plattesville, Wisc.

Oklahoma Seedling (J. Rupestris, pp. 60 1932 report).

Rohwer, from J. Rohwer, Grundy Center, Ia.

Grundy, from J. Rohwer, Grundy Center, Ia.

Stabler (one lobe), from O. H. Casper, Anna, Ill.

Sample package of new method selling black walnuts, sliced shell and meats together.

Mat made of cross sections of black walnuts fastened together with copper wire.

By J. U. Gellatly
Leaf tracing of bitternut × English walnut hybrid.

By Samuel Graham

Collection of black walnuts and hickory nuts from Ithaca, N. Y.

By J. R. Hershey
Little Giant nut cracker.
Little Giant walnut huller.

By John W. Hershey
Collection of black walnuts, hickory nuts and pecans.
One Thomas black walnut tree four feet tall, one year from graft bearing a Thomas walnut.
John W. Hershey nut cracker.

By L. K. Hostetter
Monterey black walnut.

By F. F. Jones Nurseries
Ohio black walnut.
Thomas black walnut.
Ten Eyck black walnut.
Pleas hicans.
Buchanan filberts.
Jones hybrid hazels and filberts.
Alpine English walnuts.
Hall English walnuts.
Wiltz-mayette English walnuts.

By H. F. Stoke
Homeland black walnut.
Exhibit of commercial 2-lb. package of black walnut kernels.

By Harry R. Weber
Weber walnut.

By Dr. G. A. Zimmerman
Collection of nuts.

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ATTENDANCE—1933 CONVENTION

Mrs. Laura Woodward Abbott, R. D. No. 2, Bristol, Pa.
John Alcorn, Paoli, Pa.

Dr. Frank L. Baum, Boyertown, Pa.
Mrs. Frank L. Baum, Boyertown, Pa.
Miss Dorothy Baum, Boyertown, Pa.
H. K. Beard, Schaefferstown, Pa.
Mrs. H. K. Beard, Schaefferstown, Pa.
Miss Elizabeth Beitler, Downingtown, Pa.
Al. Bergstrom, Coatesville, Pa.
Carl P. Birkinbine, Cynwyd, Pa.
A. R. Buckwalter, Flemington, N. J.

G. Y. Clement, West Chester, Pa.
Mrs. G. Y. Clement, West Chester, Pa.
Oliver Croshaw, Hightstown, Pa.
Elroy Curtis, Brookfield, Conn.
Wm. Curtis, New York, N. Y.

Dr. W. C. Deming, 31 Owen St., Hartford, Conn.
Milton Dull, Schaefferstown, Pa.
Mrs. Milton Dull, Schaefferstown, Pa.

C. E. Endy, Yellow House, Pa.

Mrs. C. E. Endy, Yellow House, Pa.

Prof. F. N. Fagan, State College, Pa.
Frank H. Frey, Chicago, Ill.

Joseph B. Gable, Stewartstown, Pa.
S. H. Graham, Ithaca, N. Y.

Paul W. Hafer, Lorane, Pa.
J. W. Hartman, Sligo, Pa.
Dr. Julian T. Hammond, Newtown, Pa.
John K. Hershey, Ronks, Pa.
J. R. Hershey, Kinzers, Pa.
John W. Hershey, Downingtown, Pa.
Mrs. John W. Hershey, Downingtown, Pa.
C. F. Hostetter, Bird-in-Hand, Pa.
Mrs. C. F. Hostetter, Bird-in-Hand, Pa.
L. K. Hostetter, Lancaster, Pa.

Mrs. J. F. Jones, Lancaster, Pa.
Miss Mildred Jones, Lancaster, Pa.

M. M. Kaufman, Clarion, Pa.
Mortimer B. Kelly, Morristown, N. J.
M. Glen Kirkpatrick, c/o Farm Journal, Philadelphia, Pa.

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Mrs. Mary Laudermitch, Lebanon, Pa.
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BOOKS AND BULLETINS ON NORTHERN NUT GROWING

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2. The Nut Culturist, Fuller, pub. Orange Judd Co., N. Y., 1906. Out of print and out of date but a systematic and well written treatise. These two books are the classics of American nut growing.
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REPORT OF THE PROCEEDINGS AT THE TWENTY-FOURTH ANNUAL MEETING ***

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