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the Twenty-First Annual Meeting

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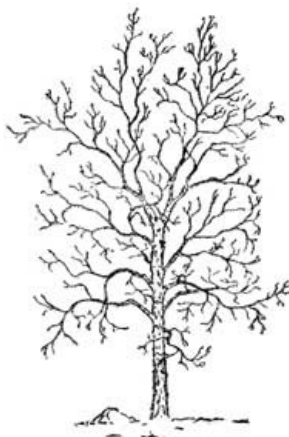
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THE PROCEEDINGS AT THE TWENTY-FIRST ANNUAL MEETING ***

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**NORTHERN
NUT GROWERS ASSOCIATION
REPORT
OF THE PROCEEDINGS AT THE
Twenty-first Annual Meeting**



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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 the 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.

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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 present at any annual meeting, notice of such amendment having been read at the previous annual meeting, or a copy of the proposed amendment having been mailed by any member to each member thirty days before the date of the annual meeting.

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BY-LAWS

ARTICLE I

Committees. The association shall appoint standing committees as follows: On membership, on finance, on programme, on press and publication, on nomenclature, on promising seedlings, 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 five dollars annually, to include one year's subscription to the American Nut Journal, or three dollars and fifty cents not including subscription to the Nut Journal. Contributing members shall pay ten dollars annually, this membership including a year's subscription to the American Nut Journal. Life members shall make one payment of fifty dollars, and shall be exempt from further dues. Honorary members shall be exempt from dues.

There shall be an annual, non-voting, membership, with privilege of the annual report, for all County Agents, Agricultural College and Experiment Station Officials and Employes, State Foresters, U. S. Department of Agriculture Officials, Editors of Agricultural Periodicals, College and High School Students, Boy Scouts, Girl Scouts or Camp Fire Girls and similar organizations, on payment of one dollar as annual dues.

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.

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ARTICLE IV

Amendments. By-laws may be amended by a two-thirds 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 receipt of this notice, their names will be dropped from the rolls for non-payment of dues.

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REPORT OF THE PROCEEDINGS

of the

TWENTY-FIRST ANNUAL CONVENTION

of the

NORTHERN NUT GROWERS ASSOCIATION

(Incorporated)

September 17, 18 and 19, 1930

CEDAR RAPIDS, IOWA

The first session convened at 10 o'clock at the Hotel Montrose, President Neilson in the chair.

THE PRESIDENT: We have a long and varied program to present, and inasmuch as we have only one day for the discussions it will be necessary to make the best use of our time. First we will read letters and telegrams from members who are not able to come.

THE SECRETARY: This letter is from Dr. Morris.

"I was counting on getting out to the Nut Growers' Association meeting this year and having the pleasure of seeing all of my old friends once more and getting the inspiration that fills the air at our meetings. I find it absolutely necessary, however, to cut off all distractions until I can get two books finished. Work upon them has been delayed and the line of thought changed so often that it becomes a duty to confine myself to literary work, but I hope to be with you during our next twenty meetings."

This telegram is from Mr. Bixby.

"Have mailed Mr. Snyder abstract of report on nut contest and paper on beechnuts. Regret I cannot be at convention. Crop of nuts here is better than ever before. Best wishes for success of convention. Willard G. Bixby."

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THE PRESIDENT: I am going to name two committees. The resolutions committee: Mr. Weber, Mr. Frey, Dr. Deming. The nominating committee: Mr. Frey, Mr. Snyder, Dr. Smith, Dr. Zimmerman, Mr. Hershey. Professor Herrick, Secretary of the Iowa State Horticultural Society, would like to make a few remarks.

PROF. HERRICK: I want to extend to you greetings from the Iowa State Horticultural Society. Mr. Snyder knows that at our state fair we had a wonderful exhibit of edible nuts. It has just closed. We had six tables of good length, 16 feet, well filled, in fact crowded. We never in the history of the society have provided enough room for the edible nuts. We hope this year at the Midwest Horticultural Exhibit at Shenandoah it may be possible for you to send your exhibits. There will be \$7,000 in cash premiums. Every one of you will receive an official premium list the first of

next week. We have in Southern Iowa a great deal of land well adapted for this industry, and I assure you that the Iowa Horticultural Society is very much interested in the spreading of the gospel.

THE PRESIDENT: We appreciate the invitation that Professor Herrick has given us. One of the inspiring factors in my interest in nut culture came to me some years ago when I came to the Iowa State College to take graduate work. I went to Des Moines with Professor Maney to see the exhibit staged by Mr. Snyder. Our first paper this morning is by Mr. Snyder, "Nuts and Nut Growers of the Middle West."

MR. SNYDER: I will confine my remarks to the newer things that you haven't heard of. I will first note a shagbark hickory that stands in my own neighborhood, an outstanding variety we call Hand. This is very much like the Vest in shape and size and cracking quality. According to my tests, this variety cracks out 50% meat, and since it is a local variety and I know it is hardy and fruitful, I am placing it ahead of the Vest for the Middle West. It is certainly equal to it in every way and hardy and fruitful. While the Vest hasn't yet matured nuts I am rather doubtful whether it will prove of any value here.

There is one nut that I have been drawing attention to in the past few years, called Hagen, that I have frequently said was the best nut growing in Iowa. I have found one we call the Elliott that appears to be just as good, so nearly like it that it is hard to separate them when they are mixed up. The Elliott stands near Oxford, a little south of here.

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The best cracker I have found in Iowa is one called Sande. This stands in Story County, about 20 miles north of Ames. I found this on the tables at our state fair and the superintendent of the nut exhibit called my attention to it in particular. Said it had been appearing there for a couple of years back, and that he thought it was very well worth our attention. I took up correspondence with the parties who were bringing it to the fair and they agreed to give me such information as I wanted about it, so I drove up there. When I got there I found they didn't own the tree. They had been stealing the nuts, putting them on exhibit and getting the premiums. They wouldn't take me to the tree because they didn't own it. They did tell me who owned it and I went to see him. I told him the circumstances. He just got red-headed at once. The idea of someone stealing the nuts and getting the premiums! We got right into it. The up-shot of it was I got some scions and some nuts. Just a lick of the hammer and two halves drop out, don't have to pick them out, just roll out. It is an excellent nut. It was a rather young tree and very fruitful. Very good quality with a little thicker shell than other varieties.

We have another one, the Ward. This is another 50% cracker, very excellent flavor. While it appears to be a small nut, after you have cracked it the meats look almost as large it has such a very thin shell. As you might say almost all meat.

DR. DEMING: What do you mean by 50% cracker?

MR. SNYDER: The shells and the meats when separated and weighed just balance each other.

I have looked up another one. At present I haven't any authority for naming this variety. I am just calling it Independence because of the community in which it is found. I will take this up with the parties that own the tree and get authority for naming it if they will consent. This is just a temporary name for a very excellent variety. It is owned by a party named Geisel. They have a well-known nut that has been taking premiums in our midwest. This is another in the same grove that is just as good as the Geisel. It is a very good nut, very fine flavor, good cracker and more than ordinary size.

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We have another one that stands in sight of my home, that is called DeWees. This is a large tree that possibly is somewhat over a hundred years old, and its common crop is about five bushels of hulled nuts. It is a free cracker, excellent quality and very prominent in the locality in which the tree stands.

There is another one that appeared in the midwest exhibition here in Cedar Rapids a few years ago, called the Lynch. It was brought out by the Boys and Girls Club and received a good deal of publicity at that time on that account. It is a thin-shelled nut and very good cracker but not of the highest eating quality. I hunted up the tree and got some scions from it and distributed them. I didn't use any of them myself, didn't think it good enough, the eating quality not good enough to suit me. It is an excellent variety however.

DR. SMITH: Something like the Ben Davis?

MR. SNYDER: Yes.

DR. COLBY: The Ben Davis makes the profit though, Dr. Smith.

MR. SNYDER: We have found another one that came out at the Cedar Rapids exposition. I am calling it the Cline. I have no authority to call it that. The tree stands here in Cedar Rapids. I haven't had time to see it since two years ago when it was brought to my attention. If I am any judge of quality this is the finest hickory nut I have ever found. Its eating quality is just ahead of anything I know of in the hickory line, and it's of fair size, a little above medium and a good cracker and a long keeper. I have frequently tested them. I only got a handful to start with. I have tested these time after time to see how long it was going to keep. The last time I tested it was this last spring and it was in excellent condition. There are a good many of our hickory nuts that turn rancid in six months. But a nut that keeps two years, and I don't know but what they are

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good yet, is going to be a very big item in hickory nut culture.

DR. DRAKE: Have you kept these eighteen months in good order?

MR. SNYDER: Yes.

MR. HERSHEY: Would soil conditions have anything to do with it?

MR. SNYDER: Possibly but I don't think so. The Fairbanks, for instance, from different soils; I can see no difference in their keeping.

MR. HERSHEY: I know that is true of grapes that are grown in different sections.

MR. SNYDER: I can see no difference in the Fairbanks. In a few weeks' time it loses its edible qualities. I wouldn't care for it after it is a few weeks old. After it is thoroughly cured and dried, I don't think the Fairbanks fit to eat.

MEMBER: How about the Stratford?

MR. SNYDER: The original Stratford was cut for fire wood in 1926. Just before it was cut it bore a heavy crop of nuts. Yesterday I cracked one. I was right hungry and needed something to eat. I could eat them yet. It is a great keeper. I know it was four years old or over.

MEMBER: How does it crack?

MR. SNYDER: It is a good cracker and very thin shelled. The Stratford is, I think, a hybrid of the shagbark and bitternut. It is very evident that it is a hybrid by the appearance of the nuts. But it doesn't have that property of the Fairbanks of spoiling as it dries. The two nuts are very different in that. You will find a great range of quality in these hybrids.

I believe that puts me through the list of hickories of which I have made a list. I have a number of others under observation that may in the future be of importance.

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I have several black walnuts that have made their appearance since our contest was completed. We now have one called the Finney. This stands in Marshall County right beside the Northwestern Railroad track. I sent this to Professor Drake of Arkansas for testing and he reported it was a little better than Thomas, so I think we have a variety there that is worth taking care of. I received the sample of nuts through a friend, I believe it was three years ago. I didn't see anything particularly attractive in the outside appearance of the nuts, so threw them aside and didn't test them until some months later. I passed it up at that time as not being better than the Thomas, anyway, and some months later I cracked another one of them. I went on that way for the last year until this last fall. I had quite a quantity of them and every time I came across them I would sample them. Finally I sent some of them to Professor Drake, with the results that I have mentioned. So now I have concluded that it is a very worthwhile variety and I have begun propagating them.

DR. DRAKE: Did you call it by another name before?

MR. SNYDER: Well, I believe I called it Brenton.

DR. DRAKE: That is the name I remember.

MR. SNYDER: From the extreme north line of our state, a place called Cresco, I received samples of a walnut. This I considered on its first appearance as being a worthwhile variety and I took it up with the party who sent it to me and we agreed to call it Cresco. It is a very thin-shelled walnut, above medium size, excellent eating quality, and coming from so far north, and ripening and being of such excellent quality, I thought it was worth looking after and we began propagating it under that name.

We have another one that made its appearance in the Cedar Rapids exposition, that has been named Safely. This is of the Ohio type of walnut and I believe will prove to be just as good, possibly better. The first samples received of this were ripened under unfavorable conditions and were not fully up to their best. I think this will be worth looking after, although I have not yet made an effort to propagate it or get scions. It is owned by a cousin of mine so I could get them.

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The best thing I have found in the state of Iowa I have authority to call Burrows. This is the finest cracking black walnut I have ever found. Just a crack of the hammer—four quarters. You don't have to pick them out. It stands near the county line of Marshall County, near a little town called Gillman.

THE PRESIDENT: Have you specimens of all of these?

MR. SNYDER: Yes, specimens on the tables. I believe this puts me through the list of nuts as far as anything new is concerned. I am quite an enthusiast about the black walnut. There is a double purpose in the black walnut here in Iowa because our saw mill men tell me, and we have the largest manufacturing walnut mills here in Iowa, they tell me the Iowa grown walnut is the most valuable black walnut and they will pay the best price for it. This alone makes it valuable to plant black walnuts here in Iowa. Another thing, they are easily and quickly grown. Our millers tell us that anyone who cuts down a walnut tree ought to be compelled to plant two. If we all followed this rule the supply would never be exhausted. We know the demand will not be.

MR. HERSHEY: Couldn't we pass a law here, as they have in Germany, that every man has to plant

thirty trees before he can get married?

THE PRESIDENT: Have you found a first class butternut?

MR. SNYDER: None, except those that have been listed for a couple of years. The Buckley is the best in the state. Sherwood is next. Those two are the best.

THE PRESIDENT: In Michigan we are interested in getting a good butternut.

MR. SNYDER: By the way, we have on the table a hybrid. This hybrid is a cross between the sieboldiana and the American butternut. We call it the Helmick hybrid. We have propagated it for our own use at home. We have it under restrictions. I have six seedlings that I have produced from seed of this Helmick hybrid that are crossed with the Stabler black walnut. In these seedlings are wrapped up three distinct species, the Stabler (*Juglans nigra*), Japanese heartnut (*Juglans sieboldiana cordiformis*) and the American butternut (*Juglans cinerea*). I know this is the result because when the Helmick hybrid bloomed its cluster containing eighteen nutlets would have perished for want of pollen to fertilize them because it had produced no staminate blossoms of its own. There being nothing on the place with ripe catkins shedding pollen, I was watching them very closely for fear there would nothing else bloom in time to fertilize the nutlets, and the first thing to offer ripe pollen that could be used was the Stabler walnut, from which I gathered a handful of catkins and carried to the Helmick hybrid and dusted pollen over the cluster of nutlets and succeeded in saving six out of the cluster of eighteen. These matured into full grown nuts which were saved and each of them grew into a nice young seedling. I know beyond question that these seedlings represent the three distinct species mentioned because there was nothing furnishing pollen with which to fertilize them except the Stabler walnut.

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THE PRESIDENT: The work that Mr. Snyder and Dr. Drake and Dr. Deming are doing in locating good varieties of nuts is certainly very valuable. If we had the whole country hunting for good nut trees we could tell what the country is producing. We have a great many valuable varieties throughout the United States and Canada.

Our next speaker is Professor T. J. Maney of the Iowa Agricultural College at Ames. I am very much pleased that the experiment stations in some of the states are actively interested in the propagating of nut trees. New York, Iowa and Ohio are doing work along this line and no doubt other experiment stations are interested. In quite a number of them there is a great lack of interest, and perhaps I should say of knowledge, about nut culture in general.

PROF. MANEY: During the past six or seven years, during our regular annual short course, we have been having a week for a nut short course and we have been very fortunate in having Mr. Harrington and Mr. Snyder there. That work has already resulted in the establishment of a nut project that will continue to grow during the coming year.

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You recall that Mr. Neilson revived the subject of paraffin. I notice that he always wound up with a plea that someone invent an apparatus to apply the paraffin. What I have here is an answer to the plea. This apparatus consists of a two and one-half inch pipe with a spray nozzle attached. The idea is to put into the tube hot paraffin and apply pressure here, and then with a plumber's blowtorch keep the paraffin heated. The handle is covered with asbestos. I didn't spend much time in working this up but I think it works fairly well. There is one difficulty in perfecting your apparatus to apply hot paraffin, and that is the fact that when it comes out it immediately congeals into a sort of snow. You just can't atomize hot paraffin. The only way is through air pressure. I used this on some dahlia roots quite successfully. This did the work very well in that case and I think for applying it to rose roots and plants of that kind it may work quite successfully. Another thing I thought might be of interest to you is some work in grafting by the use of paraffin. Last year I was interested in grafting some apples. On July 12th I made some regular cleft grafts, using the green wood as the scion after removing the leaves.

DR. SMITH: Wood of that year or previous?

PROF. MANEY: That year. The entire graft was covered with paraffin. This picture was taken on September 5th, a period of 55 days later, and during that time growth was 25 inches. I am sure it can be worked very successfully with different fruit trees. It is especially valuable in replacing dead grafts. These grafts went through the very severe winter very successfully. I am sure I appreciate this opportunity to appear on the program, and I hope to continue with the work at Ames and perhaps appear at future dates.

MR. WEBER: May I ask how hot it got that summer?

PROF. MANEY: Oh, the temperature was up to 100, 103 and 104.

MR. WEBER: What kind of paraffin did you use?

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PROF. MANEY: Just ordinary paraffin.

MR. WEBER: Did you notice any bad results?

PROF. MANEY: No, apparently no ill effects.

MR. WEBER: Paraffin has a tendency when it gets extremely hot to run down and kill the graft.

DR. SMITH: What would be the effect of putting in some beeswax?

PROF. MANEY: I think that would be all right.

MR. WEBER: Paraffin this summer killed two nut grafts for me.

DR. ZIMMERMAN: Are you sure it was the paraffin? I have finally come to the conclusion that when the sun gets hot enough to melt the wax it will kill the graft anyway.

MR. WEBER: I noticed the heat did not kill another one that I did not use the paraffin on. Previous years it simply scorched the tree.

DR. ZIMMERMAN: The heavy coating of wax protects a little from the heat, I thought.

MR. HARRINGTON: In very hot weather I put heavy paper around the graft and a handful of dirt. That protects it from the sun.

MR. WEBER: I have tried that.

THE PRESIDENT: I am very much interested in seeing Professor Maney's spraying apparatus. We also tried to spray and got something like snow. We also found that the wax congealed in the nozzle. Last spring I almost blew my head off. I am now experimenting with a material which acts as an emulsifying agent on waxes and resin. I have developed a formula, paraffin 5 pounds and Pick Up Gum one pound. I dissolve the emulsifying agent and heat the wax. This solution can be sprayed on trees without difficulty when it is warm. When it gets cool, however, we have to heat it again. I hope to have some definite reports to make as to the feasibility of this later on, and possibly on conifers as well. We have been up a tree when it came to spraying wax and we have been at a disadvantage in transplanting conifers. Regarding the comments as to paraffin wax melting, I do have a little difficulty on the south side and sloping to the northeast. The sun's rays would be rather direct. I think the suggestion Mr. Weber made was very good. Two-thirds paraffin and one-third beeswax. Possibly we would have to increase the beeswax where trees are growing on a southern slope.

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DR. ZIMMERMAN: I found the hottest place 2 inches above the soil. I shade grafts with a piece of shingle.

THE PRESIDENT: The principle in grafting trees is to regulate the moisture and the temperature factors. As a means of regulating the moisture I use German peat around the graft.

MR. HERSHEY: Have any of you had experience in grafting on the north side of the stock? I found that quite a good scheme, so that the heat doesn't kill the grafts. We grafted on the 15th of June this year.

THE PRESIDENT: Professor Drake has done a good deal of work in locating good varieties of black walnuts in the southwest and I am sure he will be glad to tell you what he has found. Let me repeat what I said about Mr. Snyder's work, that the most valuable work that is being done is the discovering of new varieties of nuts.

PROF. DRAKE: I shall talk about the methods I use in scoring the black walnut in Arkansas. Color of kernel. The way I have determined that is to first make a measuring scale. Get walnuts whose kernels show different color. The lightest I call number one. It is quite easy to divide them into five different groups. I feel that this grading can be pretty well done, except possibly for the flavor, all the way through. Applying this method to different nuts, here is the result that I have obtained with the best ones:

I find the Stabler to rank first, with total grade points of 71.66. For making the test with the Stabler I have had Stabler nuts from a number of different places, Snyder, Reed, University of Missouri and nuts I have grown myself.

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The next two will be a surprise to you and I feel quite sure that after further tests they may grade differently. The next highest is the Ogden. I believe it was found in Kentucky in 1926 or 1927. Score of 70.90. The Ogden nuts that I tested were thoroughly dry and gave an excellent cracking quality, and I expect the test would go down a little bit had they not been dried so long. I am sure, however, the Ogden is an excellent cracker. I don't know just how the flavor of the Ogden will be. I have some feeling that the flavor will not be as good as some.

The third is the Adams. This one comes from West Park in the northern part of Iowa. It is one that runs very high in kernel per cent. This gives a total score of 70.87.

While I think of it, there is one point about the method that I use for scoring that is better, I think, than some other methods that have been used, that it gives credit for even a part of a per cent. You will notice that I run these out to the third point.

I can't say about the Adams color. That nut also had been thoroughly dried and I think the cracking quality shows better than it ordinarily would. I think that is a variety that we should keep in mind and especially that it should be used for crossing because of high percentage of kernel.

The fourth comes from Arkansas, that I have called the "Walker." Scored 70. I suppose we can't claim it entirely from Arkansas, although it was planted there about 50 years ago. The owner moved there from Illinois. There are five or six trees, two of them with excellent nuts. The chances are that the score of this would be lowered somewhat if it were more thoroughly tested. Last year when I tested I only got four. He told me that was almost the most complete failure he had ever known for that tree. Of those four only two were good. One of them I tested before it was thoroughly dry and I felt that I couldn't test it properly. The other nut I tested was larger. It

weighed about 36 grams. I am sure that size will be cut down when we can get the nuts from a normal crop. This year the tree has a good crop and it can be tested more thoroughly.

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The next on the list is the Burrows. I think I only had two nuts for testing this variety. So this score may be somewhat altered. I always try to test at least ten nuts, and another year if I can get a sample I will test them again. The score was 69.79.

Following that is another one of Mr. Snyder's, the Finney, from Iowa. That scored 68.82. After that comes our old standard variety, the Ohio, 68.30. Thomas 67.93. Following the Thomas is a variety, the Bohanan, with a score of 66.89. After that the Asbury, 66.65; and the Iowa variety from Iowa that John Rohwer sent me, 66.36. The Iowa is a little bit better cracker than the Rohwer. Not quite as high percentage of kernel. Slightly larger nut I believe. The Iowa nut is a little rougher on the outside than the Rohwer. Following the Iowa is the Edgewood from Arkansas. This is another of those trees, the parent tree coming from Illinois, score 66. Ten Eyck, score 65.75. Knapke, score 63.73. Very good producer. Following that is the Arkansas variety from my home with a score of 63.11. The next variety comes from British Columbia, the Attick, 62.02. As I have said, of some of these I have not had sufficient nuts, and some of them are more thoroughly dry than others. I am sure there will be some shifting in place. However, for the better walnuts that I have and the ones I have plenty to test with I feel that there will be little change from where I have placed them. I have made another grouping. For large size the Walker scores the highest with 36.20 points. Now as to cracking quality, the Throp 100%, Ogden 94.43%.

MEMBER: What did you crack them with?

PROF. DRAKE: With a hammer.

DR. COLBY: Do you use any fertilizer in your orchard?

PROF. DRAKE: I have some. At first I didn't but afterwards I used some barn yard manure and some nitrate. Of late years I put some bone meal around the roots when I plant them.

THE PRESIDENT: Any further discussion of this interesting paper?

DR. DEMING: Do you use the hammer in cracking entirely?

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PROF. DRAKE: Yes, sir.

DR. DEMING: Why do you not use the mechanical cracker? Do you not think the commercial value of the black walnut is best tested by using a mechanical cracker? It will never be cracked with a hammer.

PROF. DRAKE: That point is well taken. In the first place I didn't have a commercial cracker but plenty of hammers. Another thing, the commercial crackers are being developed. Unless we all try them out in the same way there would be no value in it. I thought it would be more accurate to use a hammer.

THE PRESIDENT: Professor A. F. Yeager is unable to be with us. Therefore, Dr. Colby will read his paper.

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NUTS IN NORTH DAKOTA

By Prof. A. F. Yeager

The growing of nuts in North Dakota has hardly been considered as a possibility even by the average amateur up to the present time. Nevertheless, evidence is gradually accumulating that some varieties of nuts can be grown as an addition to the home orchard in nearly all parts of the state.

We have no native nut plants except the hazel and our native hazel seldom produces nuts in any quantity in the wild state, hence the possibility of growing them for profit undoubtedly lies some distance in the future.

Nut bearing plants which have been introduced with success are the butternut and the black walnut. Trees of these two species are to be found in small numbers at various points in the state and have in practically every case been grown from nuts planted where the trees are now standing. In the past many failures have been reported with trees grown from nuts sent up from the South. Such trees as are now standing are the hardy remnants of considerable numbers of seedlings started, most of which have fallen by the wayside because of the rigors of our climate. Black walnut trees raised from seed produced on trees which have reached fruiting age in North Dakota seem to possess the necessary hardiness. As to whether the named varieties of walnuts would be a success in this territory remains a question. Their culture has not been attempted.

Butternuts are naturally a more northerly species than black walnuts but have not been so widely planted in North Dakota. Nevertheless there is a sprinkling of bearing butternut trees in some of the pioneer groves. Seed from these was planted at the experiment station in the fall of 1920. The seedlings prospered and some of them bore nuts in 1925, one tree producing 114 nuts that

year. Since then there has been a crop each year and the trees have been making a growth of a foot or more per year. This would seem to indicate that the butternut has possibilities, at least as a producer of nuts for home consumption.

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Both the black walnut and butternut are subject to damage by late spring frosts which kill off the opening blossoms. While it is not likely that North Dakota will be a commercial nut growing state, we can look forward with confidence to the time when a group of nut trees will be included in the grove which will surround each North Dakota home.

THE PRESIDENT: Butternuts and walnuts grow in Manitoba. I know of 47 trees.

MEMBER: Mr. Gall reports that heartnuts have endured the winter in northwestern Manitoba. The black walnut has grown quite well in Swift Current. That part of Canada is much colder.

THE PRESIDENT: Our next paper is a report on the nut contest. Mr. Bixby had planned to be here, but was unable to come. Has Dr. Deming anything to offer?

DR. DEMING: I have no very definite report to make on the nut contest, because it wasn't finished until about two weeks ago and I haven't had time to work on the results. The important part of the report is the result of Mr. Bixby's scientific calculations on the properties of the nuts, and this will be published in the report. The contest this year cannot rank in extent and value with the contest of 1926. One reason for that is that the nut crop last fall seems to have been everywhere very deficient, and in fact many contestants sent in nuts from the year before. The second reason is that we didn't get good advertising. I don't know exactly why we didn't. At first I didn't think we were going to get any nuts at all. But belated notices in the Fruit Grower, and especially in the Farm Journal, finally waked up a lot of contestants. Possibly a third reason why the contest was not as successful as in 1926 was that there were so many kinds of nuts for which prizes were offered. I think that is rather confusing. I think we had better do as in 1926 and offer a prize for a single nut each year, rather than prizes for all the nuts each year. Take one nut one year and another nut the next year, and so on, and then begin over again. At the same time I think we ought to have a standing prize for nuts of each species, that is for any better than those we already have. We have such a prize for the hickory, the Bowditch. At different times other members have offered prizes for other species. I would be glad to offer another standing prize of \$25 for some other nut in addition to Mr. Bowditch's for the hickory. Three hundred eighty-eight people sent in nuts. That was many fewer than in 1926. 138 people wrote letters but never sent any nuts. There were 243 different black walnut specimens this year and 1229 in 1926. We had some very valuable black walnuts. Some fully equal to, if not better than, those we already have. Very few came from the South. More came from the northern states. Wisconsin, Minnesota and Michigan were well represented. We got 94 different specimens of butternuts. Some of these were very good. Most of them were from the North, Vermont and Wisconsin leading. We got 134 specimens of shagbark hickory, 40 shellbarks and 10 others, perhaps hybrids or other species. There was one California black walnut and only 4 beechnuts, very small indeed. Not worthy of propagation at all. There were a few odd nuts. Only 40 chestnuts were sent. I think that was because we did not get our publicity out soon enough. The chestnut crop matures earlier and in many instances the crops were out of the way. Of these chestnuts, 20 were Japanese. When you first tasted them they tasted like potato but later developed a large amount of sweetness. There were 20 American chestnuts. Dr. Zimmerman would call them small because his standards for the American chestnut are larger than my New England ideas. When the chestnuts first came in they were quite green. In a few days they hardened. If I dried them a little and then put them in boxes they began to mold and soon would be a mass of mold. It always seemed to begin at the butt end and would gradually spread over the whole nut and then get inside and spoil it. I washed some in boric acid, others in formaldehyde, and that hardened them. Then I tried packing them in pulverized sugar and in salt. That extracted all the water so that in a few hours you could pour out half a glass of water. I packed them in peat moss and sand and treated them in various ways, and finally packed them in fresh hardwood sawdust. In this they kept in good condition.

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DR. SMITH: Did you try sphagnum moss?

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DR. DEMING: No. Another writer says an excellent thing is ground limestone.

THE PRESIDENT: Did you get any Japanese walnuts?

DR. DEMING: We got only three, of no merit.

MEMBER: The value of the nut tree is going to be determined by its vigor and its bearing qualities. If it doesn't produce any nuts it isn't going to be any good. Mr. Bixby and Dr. Deming have allowed nothing for the bearing qualities.

DR. ZIMMERMAN: I am wondering whether it might be possible in some way to get these different factors together and judge the nuts from all angles.

DR. DEMING: That, I think, is absolutely necessary. That is, to combine these two scales of judging, the tree characteristics and those of the nuts. Ultimately we have got to allow a large factor for adaptation and productiveness.

DR. ZIMMERMAN: A nut may crack well at one time and not so well later on. The moisture of the nuts is a factor.

DR. DEMING: I don't agree with Dr. Smith that we should not use the mechanical cracker.

DR. SMITH: We also want the hammer. We must crack them in the most favorable way.

DR. DEMING: I think the hammer is of very little value. I think we should crack them all with a mechanical cracker. If you crack with a mechanical cracker, the two plungers come together by compression, which crushes the ends in and makes the sides burst out, thereby releasing the kernel.

MR. HERSHEY: With the mechanical cracker the shells burst away from the kernel.

MR. FREY: My experience is that the mechanical cracker outclasses the hammer. The walls of the nut shatter outwards and save the kernel, whereas with a hammer you mash the nut. I can't see the value of the contest in 1929 when the scion wood for those nuts can't be secured until 1931. There is too much delay. I think if we would establish a permanent award for a better nut of any variety that is sent in we will make better progress. One nut that I know was put in the contest last year. The tree was cut down before they could even write for the scion wood.

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MEMBER: I got a shipment of chestnuts at one time. I took a ten-gallon milk can and put two inches of sawdust in it. I originally had 50 pounds of nuts but sold some of them. I had 8 or 10 pounds left. I sealed them up tight, put the lid on, and a year from the next April I opened the can. The ones on the bottom had started to grow, they had tops of 4 or 5 inches long and they had a network of roots. But on top of those the nuts were in perfect condition. I shipped some of them to Washington. I planted some of them. Perhaps 9 out of 10 were in perfect condition and they grew.

DR. SMITH: I would like to suggest another method of keeping chestnuts. Pack them in sphagnum moss, put them in cold storage and freeze them solid.

MR. HERSHEY: Mr. Bixby digs a trench, plants the nuts in it, covers them with leaves and then with an inch or two of soil.

THE PRESIDENT: One of the officers of the Bureau of Plant Industry, traveling in Asia, took some seeds and dipped them in paraffin wax. I know it is an excellent method of keeping dahlia roots.

We have another item on our program, "New Members' Experience and Questions." Possibly we have some new members here who have had experiences and would like to tell us of them.

MEMBER: My first experience was with Mr. Snyder at Ames. I saw on the program a nut lecture, so I went. For the past two years I have been attending the short course and heard Mr. Snyder lecture. A year ago this spring I got some scions from Mr. Snyder. Four scions out of 7 grew. It was the first time I had ever done any grafting at all. I used paraffin for grafting.

THE PRESIDENT: You got very good results indeed. This year I made a miserable failure. I believe I only got about 12% to grow. I hope you always have the same good luck.

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DR. SMITH: If he wants to keep his record he better not do any more grafting.

DR. ZIMMERMAN: Pretty near everybody this year reports a miserable failure. There must be some reason.

DR. SMITH: It may be the drought.

PROF. DRAKE: I only got three to grow. We had enough rain in the spring.

DR. ZIMMERMAN: My opinion is that last winter was hard on wood. There was an early freeze in the central states. My observation is that the wood was injured through the winter. I think any scion wood was not very good.

PROF. DRAKE: In our part of the country the temperature ran from 24 to 26 below zero.

MR. HERSHEY: If you notice in making the graft little pin points of black on the scions, you can almost bet on a failure.

DR. ZIMMERMAN: Some of the worst looking scions at times grow the best. You put them on and they all grow. Another time you have beautiful scions and they all die.

MR. HARRINGTON: There is injury you can't see with the naked eye. The wood was unripened when our winter set in. We had a very severe winter in our section here. My practice has been to store my scion wood in November.

MR. FREY: The cold weather in January wouldn't affect that. I am inclined to think the scion wood injury was done before winter set in.

MEMBER: When is the best time to gather scion wood? Mr. Harrington says in the fall. I have been getting mine in February. Is it better to cut the wood when entirely dormant, or would it grow better if cut when the sap starts in the spring?

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MR. HARRINGTON: I want my scions cut early.

DR. SMITH: How early can you cut them?

MR. HARRINGTON: When the scars from the leaves have dried up thoroughly. I have known them

even in December to be still sappy. They didn't grow well that year. I often cut them the last week in November.

MR. HERSHEY: I would advise Dr. Smith not to cut too early in the fall.

DR. ZIMMERMAN: From my papaws I cut scions in the fall.

THE PRESIDENT: From the comments made here this morning I have an opinion that the question certainly needs looking into. We could cut our scions earlier.

DR. ZIMMERMAN: I wouldn't cut them at that time if I didn't have to.

MR. HERSHEY: I think that is a good admission. Another thing, if you paraffin your scions you need cat's paws to hang on to them. Dr. Morris said last year, "Melt your paraffin off with hot water." We tried it, got paraffin all over ourselves and cooked the wood. So then we scraped the paraffin off.

DR. DEMING: Dr. Neilson has said if there are any new members we would like to hear from them. If there are no new members there should be some. Our secretary sits at the table, ready and anxious to receive the dues and names of new members. I have always felt that we never treat new members with sufficient deference. I think we should ask them to talk about their experiences, to tell us what they have done, to tell us what they would like to do, to ask us questions, and that we should make them feel more at home.

THE PRESIDENT: That is very much to the point.

DR. DEMING: Why isn't the chestnut more appreciated in this country? Why aren't the farmers acquainted with the possibilities of growing chestnuts here in the middle west? Yesterday Dr. Zimmerman and I were at Mr. Harrington's and there we saw chestnut trees that would make your heart warm to look at. Why can't the people of the middle west, where the chestnut is not native, be awakened to the great possibilities of growing the chestnut commercially? It is easy to grow. It bears early, and abundantly. What can we do to make it better known? I would like to ask Dr. Zimmerman.

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DR. ZIMMERMAN: Chestnut growers say "We can't keep them." Several years ago I got a hundred pounds of chestnuts down in Illinois. I sold them out to friends of mine. In a few weeks those chestnuts were dry enough to use for roller bearings. That is the reason they don't like the chestnut. I think that hurts the chestnut business more than anything else.

MR. HERSHEY: I would like to ask why insist on introducing the chestnut when we have the black walnut? I would just as soon eat bran as a chestnut. Now the black walnut you can keep for two years.

DR. ZIMMERMAN: In the last few years I have been in intimate contact with chestnuts. I don't see why the people here don't take them up. If you don't do it the people on the west coast are going to plant chestnuts and ship them to the eastern market. You people can raise chestnuts. The eastern markets are full of chestnuts from Europe. What we need is chestnuts like the Riehl's. The large European chestnuts are of poor flavor. Take the varieties you can grow around here and send them to the East and you will get 50 cents a pound for them. Authorities tell us the trees will die off. I tell you you will all die off after a while. You aren't going to quit working because you are going to die off. Within three years you will have trees that will bear. You may get from twelve to fifteen crops off of them before they die. So far as the food quality of the chestnut is concerned it is not a balanced diet, mostly sugar, but it is a splendid food. The difficulty is in keeping it soft. But it is not a difficult thing. Cold storage will keep the chestnut in splendid shape for eating purposes. I would plant chestnuts and plant them now. Sooner or later, if they die off, we in the East will be prepared to replace them, but for the present you will have the whole field east of the Rocky Mountains. I do not know of another opportunity as great as the chestnut. I just wish I could take 20 acres of this land with me back to my rocky Pennsylvania farm.

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DR. COLBY: In Illinois the chestnut is not native and people don't realize that it can be grown. Some of the speakers have mentioned the Riehls. I want to mention the Endicott place. Mr. Endicott tells me that it is increasingly difficult to supply the demand for his chestnuts. He sells his nuts sometimes a year in advance. Developing of cleaning machinery and sorting machinery is going on apace. Mr. Endicott is interested in a sorting machine such as we use for apples. It is true we are going to get the blight out here sooner or later. Meantime we are going to try to anticipate it by securing hybrids which are resistant and of good quality at the same time.

MR. SNYDER: I would like to say a word as to planting chestnuts here in Iowa, and especially here north. What has been said is true of the southern part of the state. We may grow varieties there that it would not do to plant in the northern part of the state. I think I can show you tomorrow if you visit my place that I have had considerable experience in planting chestnuts just as an experiment. The first planting mostly has gone out because of our climatic conditions. We have severe winters. We must be careful what varieties we plant and what stocks they are worked on when we do plant them. A few years ago a nurseryman wrote me he would like to go out of business and he had chestnut seedlings for sale. I bought his seedlings. I lost them all the next winter. Why? Because of their mixed parentage, European and Japanese. They were not hardy, that was all there was to it. If the nurserymen here and farther north will be careful in the selection of the varieties they use, we can grow them. There are two factors, the stocks you graft

on and the varieties you want to grow.

MR. FREY: In my old home place there are native chestnuts over 60 years old.

MR. SNYDER: If we had time I could take you to visit a grove of chestnut trees, planted by one of the oldtimers, possibly seventy years ago. I haven't been able to learn where the seed came from, evidently from some northeastern country. That is where I get my seeds. Any trees that I have grown from seedlings are dependable trees.

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MR. HERRICK: One point should be carried in mind. While we think of Des Moines as located in central Iowa, as far as temperature is concerned it is really southern Iowa. The weather at Ames, which is 30 miles north of Des Moines, is far more severe. At Des Moines we can raise Grimes Golden apples. At Ames it is almost impossible. I think that the reason more people are not planting more of these good varieties of walnuts and other species is that they cannot get the trees. And then they are very high priced. Mr. Snyder says that it takes a long time to propagate these trees. People don't like to pay \$5.00 or \$6.00 for a tree and then maybe not have it grow. As I understand, Mr. Snyder is about the only nurseryman in the state that furnishes nut trees, I mean new varieties.

MR. BOYCE: Would it be a good plan to plant black walnuts and grow the seedlings right where you want your orchard?

MR. SNYDER: I think that is a very good plan.

DR. COLBY: An excellent way if you can get a man to do the grafting.

MR. BOYCE: What would be a reasonable price for grafting?

DR. COLBY: Mr. Wilkinson has done considerable of that kind of work.

PROF. DRAKE: I have been more successful in budding.

MR. HERSHEY: We can't in Pennsylvania. In the winter the buds kill off.

THE PRESIDENT: Mr. Hershey's experience is like mine, about \$7.00 a graft. I will say that if I give grafting demonstrations, as I have in Michigan, I always tell my audience a little story. Once upon a time there was a wild west show. An old Indian chief on the outside proclaimed the merits of the show. He always finished by saying, "And now, ladies and gentlemen, if you go into this show I positively will not give you your money back." I generally tell my audience I positively will not guarantee anything. If none of the scions grow they can't come back and say, "I told you so."

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DR. DEMING: I would like to have our president talk about methods of making the transplanting of nursery grafted trees safer for the purchaser. Dr. Neilson has had a good deal of experience in setting out nursery stock.

THE PRESIDENT: Quite naturally in the progress of time we gain some knowledge by experience. Sometimes that experience is very costly. We remember it more clearly. During the past year I made a few observations on transplanting nut trees. Some of you who were at Ontario in 1928 and New York last year, heard me speak of doing it by means of paraffin coating which has been successful in quite a wide area of this country and in Canada. The difficulty was that during very hot weather the wax melted and ran down and did some injury on the south side of the tree. I did notice that if you inclined the tree to the southwest just a little there was very little injury, whereas if they leaned to the northeast there was injury. I would suggest this, that if you are planting on southern slopes and happen to be in localities where there are very high temperatures, you use 1-3 beeswax and 2-3 paraffin. Beeswax has been proven to be quite safe over wounds and trees in general. This treatment has been used over a very wide area, in 18 states and 5 Canadian Provinces. We have information at hand on 130,000 roses, 15,000 pecans, 2,000 apples. We have had very few complaints from the people who have used this treatment. Because of that, I firmly believe that the principle of applying a protective coating to the upper part of the tree and branches is correct. I have made another observation in protecting roots against devitalizing. Certain kinds of trees, hickory, walnut, are very susceptible to injury to the roots. I tried paraffin on the cut roots and got very good healing. I found that wherever I packed moist peat around the roots there was very good response. Last spring I took about 100 seedling black walnuts and put half in good loamy soil, the other half in moist peat. I got very good results from those packed in peat. In the loam in 7 weeks not one scion had grown. I took those pots and took out the dirt. I later planted them in a cold frame in peat and practically every one of those walnut trees grew. I believe that the peat had some beneficial effect.

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MR. FREY: From the time the nut tree is dug until it is planted the nursery should pack it so it will keep moist. The purchaser should not let the wind or sun strike it. I had some trees sent from Texas to Oklahoma. The fellow who did the work heeled them in improperly. Every tree died. Keeping the roots moist is half the problem.

THE PRESIDENT: Very important indeed. Mr. Gellatly shipped heartnut trees to Augusta. These trees were packed in moss and paraffined. They arrived in excellent condition. The trip took six weeks and they travelled 3,000 miles.

DR. SMITH: What season?

THE PRESIDENT: About the first of April, and arrived about the middle of May.

DR. DEMING: Could you make an artificial ball in which the roots of a plant could be packed? Say peat moss, which is light, and send that to the customer and tell him to plant it just as it is.

THE PRESIDENT: I think possibly that can be done. The Wedge Nursery of Albert Lea, Minnesota, have a method of packing roses in sphagnum moss. They soak this material very thoroughly, embed the roots in it, and outside this material they apply some water-proof covering.

AFTERNOON SESSION, SEPTEMBER 17TH, 1930

THE PRESIDENT: At our last meeting in New York, Dr. Deming suggested that it might be well worth while to make a study of the Japanese walnut. His suggestion appealed to me, for I have been interested in the occurrence and distribution of this species. I have not had an opportunity to travel very widely on this continent, so I have had to depend partly on the observation of other people. I sent out a questionnaire to members of our association and horticultural experiment stations throughout the United States and got a good response.

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SOME NOTES ON THE JAPANESE WALNUT IN NORTH AMERICA

Dr. J. A. Neilson, Michigan

The Japanese walnut, *Juglans sieboldiana*, and its varietal form *cordiformis*, were said to have been introduced into America from Japan about 1870 by a nurseryman at San Jose, California. From this and other subsequent introductions a considerable number have been grown and distributed in the United States and Canada.

A recent inquiry by the writer brought forth some interesting data relative to the occurrence and distribution of this species in North America. This inquiry shows that it has been widely distributed and is reported in the following states: Arkansas, Arizona, Alabama, Connecticut, California, Delaware, Illinois, Iowa, Indiana, Kentucky, Massachusetts, Missouri, Minnesota, Maryland, Maine, Mississippi, Michigan, New Jersey, New York, New Hampshire, Ohio, Oregon, Pennsylvania, Rhode Island, Vermont, Virginia, West Virginia, Washington, and Wisconsin. No reports were received from South Carolina, Louisiana, Montana, North Carolina, North and South Dakota, Idaho, Georgia, Colorado, Kansas, Texas, and Wyoming, and negative reports were received from Florida, New Mexico, Nevada, Oklahoma, and Tennessee.

In none of these states is the Japanese walnut abundant in the same degree as other kinds of nut trees, but in some states it was reported more frequently than in others. It occurs more abundantly in Pennsylvania, New York, Connecticut, New Jersey and Delaware than in other states.

In Canada it has been reported from Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Alberta and British Columbia. In Ontario it is found occasionally from Windsor to the Quebec boundary and from Lake Erie to North Bay. There are several fine large trees in southern Ontario, some of which are worthy of propagation. Many of the trees in Ontario and other eastern provinces grew from nuts distributed by the writer several years ago. For five years in succession the writer bought the crop from a large heartnut tree near Jordan Station, Ontario, and distributed the nuts all over Canada to those who were interested. More than twelve thousand nuts were thus distributed and I know from observation and reports that seedling trees are now growing from the Atlantic to the Pacific. I am going to tax your credulity to the utmost and tell you that one of my correspondents reports heartnut trees growing in the Peace River area of northern Alberta. I have no recent report from my friend but I know that the trees came through two winters in that far northland.

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Possibly in the days to come a superior seedling or a hybrid may be found in these numerous seedlings which will be worth propagating. Some of these trees have already borne nuts and many have made very good growth.

The Japanese walnut has also been reported from New Zealand and several states in Australia, England, France, Germany and other European countries.

Climatic Adaptation

From the foregoing it can be seen that this species of walnut has been widely distributed and is now growing in countries with a wide temperature range. Reports are on hand which show that the trees have endured temperatures of 40 below zero F. to 110° above zero. From this it need not be assumed that all Japanese walnut trees will stand great extremes of heat and cold, for experience shows that they will not. It does show, however, that some individuals at least have marked hardiness to cold and heat and have endured temperatures much greater than the English walnut. The best results in growth and fruitfulness have been obtained in those regions

of moderate rainfall where the apple and sweet cherry grow successfully.

Soil Requirements

The Japanese walnut seems to thrive on many soil types ranging from a heavy clay to a light sand, but does best on what is popularly known as a well drained fertile sandy loam with a friable clay subsoil. It will not do well on strongly acid soils and those who have planted trees on such soils should apply lime in liberal quantities. Poorly drained soils or very light soils deficient in humus are also not suitable.

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Tree and Nut Characteristics

The Japanese walnut has several characteristics which make it desirable as an ornamental and as a nut-bearing tree. It grows rapidly, has large numerous luxuriant leaves which give it a tropical effect, and usually has a symmetrical outline. It bears early, sometimes in the second year from the graft, yields heavily and is often reported to yield regularly.

A heartnut tree owned by Mr. Sylvester Kratz of Jordan Station, Ontario, produced nearly seven bushels of husked nuts one season and Mr. J. W. Hershey reports a yield of ten bushels of heartnuts from a tree near Olney, Pennsylvania. He also reports a cash return of \$50.00 from one tree grown by Mr. Killen of Felton, Delaware. These were heartnuts and sold for 50 to 75 cents a pound. Mr. J. V. Gellatly, Westbank, B. C., obtained a yield of ten bushels of unhusked nuts from a heartnut tree of medium size. The yields from the common type, *J. sieboldiana*, have also been heavy, but since no figures are available no definite statements can be made.

In the Japanese walnut as in other species of nuts there is marked variation in nut characteristics, such as size, thickness of shell, cracking quality, extraction quality and flavor of kernel. Heartnuts have been found ranging from 1/2 in. to 1-3/4 in. in length. The largest heartnut I have ever seen came from Gellatly Brothers of Westbank, B. C. This nut was 1-3/4 in. long by 1-1/4 in. wide and was fully 1 in. thick. I also located a fine *Sieboldiana* type which is said to be the largest found up to date. (See specimens in jars).

Some of these good kinds possess excellent cracking and extraction quality. Mr. John Hershey of Downingtown, Pa., reports several good easy-cracking strains not yet introduced and Mr. Gellatly has one called O. K. that can easily be cracked with a hand nut cracker. I have also found one that I believe is a hybrid and which has excellent cracking and extraction quality. These specimens came from a seedling heartnut grown by Mr. Claude Mitchell, Scotland, Ontario. The nuts are longer than any heartnut found so far. The kernels in many cases fall out whole or in halves. This strain received the O. K. of Prof. Reed and Dr. Deming and as you know when a nut gets by either of those gentlemen it has to possess some merit. The good result produced by nature without any assistance from man suggests the possibility of getting even better results from parents of superior characters. I believe the Japanese walnut offers interesting possibilities in breeding with the butternut and possibly the black and English walnut. Definite plant breeding work should be done with these species as well as with all other species of nuts.

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The Japanese walnuts generally grow fast but usually do not attain a large size. In most cases the trees rarely grow more than 35 feet tall with a spread of 30 to 50 feet, but occasionally specimens attain much larger size. The writer saw a heartnut tree on Mr. Kratz's farm near Jordan Station, Ontario, which had a trunk diameter of 2 ft., a height of 35 ft., and a spread of 64 ft. Near St. Thomas, Ontario, there is a large *sieboldiana* tree which is 75 ft. across the top and is about 45 ft. tall. Mr. Ricks reports a huge tree near Olney, Pennsylvania, that is 80 ft. across the top and 60 ft. tall and Dr. Deming reports a tree with a spread of 100 ft.

Varieties

Through the efforts of the Northern Nut Growers Association members several good varieties have been found and propagated. These varieties have been widely distributed but have not been extensively planted. The results are variable as might be expected, but generally the reports are satisfactory. In the eastern states the following varieties seem to do reasonably well: Faust, Bates, Ritchie and Stranger. In British Columbia, Messrs. J. U. and David Gellatly have located several very good strains such as Gellatly, O. K., Calendar, Walters and Rosefield. These newer varieties from the West have several good characters and are worthy of a wider trial in the East.

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Diseases and Insect Pests

In common with most other forms of plant life the trees are susceptible to some insects and diseases.

Reports of injury by the walnut weevil, *Conotrachelus juglandis*, and also by codling moth larvae have been received. In some cases the foliage is attacked by rust fungi and some injury is also done by leaf spot. Prof. Reed reports witches broom attacking some trees in the South and one case of this disease was observed by the writer in Ontario on a *Siebold*-butternut hybrid. Notwithstanding these defects it is believed that the Japanese walnut is less attacked by disease and insects than most other species of nut trees.

Opinion of Observers

The opinion of a group of people on the merits or defects of a tree species or project is worthy of consideration. In order to get an expression of opinion as to the merits of the Japanese walnut the following question was asked: Do you consider the better strains of Japanese walnut worthy of more extended planting? The answers to this inquiry were numerous and varied. The great majority were in favor of increased plantings but a few were somewhat dubious. Nearly every one agreed that the species possessed marked beauty and was worthy of more extended planting as an ornamental. Some gave preference to the nuts over the black and English but the majority thought the quality was not quite up to the standard of these two species. Some observers reported favorably on the heartnut for culinary purposes and as an ingredient of ice cream and candy. With these latter comments I have had personal experience and can heartily agree.

Summary

From the evidence furnished by correspondents and from personal observation the good qualities of the Japanese walnut may be summed up as follows:

Rapid growth, marked beauty of form and foliage, early bearing, productiveness, and more than average hardiness to winter cold. The nuts from superior trees are easier to crack than the butternut, hickory and black walnut, but not so easy as the pecan and Persian walnut. These superior varieties yield nuts with a mild flavor which appeals to the taste of many people, but others think the flavor is not quite pronounced enough. [Pg 44]

This species crosses readily with the butternut and offers interesting possibilities for the plant breeder.

The trees appear to be somewhat less susceptible to insects and diseases than other walnuts, but this may not always hold good.

The defects of the Japanese walnut most frequently mentioned are lack of flavor and pollination deficiencies. Some trees produce staminate flowers too early for proper pollination and thus do not yield a crop unless another good pollinator grows nearby.

Susceptibility to sun-scald and to San Jose scale are some other weaknesses. Many of the trees commonly grown are undesirable because of small size of nuts, poor cracking quality and too mild a flavor.

A careful consideration of the good and bad characters of Japanese walnuts suggests the following program before the culture of this species can be placed on a sound basis.

1. A systematic and thorough search of the United States and Canada for productive trees yielding nuts of large size, of good cracking and extraction quality and pleasing flavor.
2. The propagation and wide dissemination of these superior strains to members of the Northern Nut Growers Association and particularly to experiment stations where there seems to be a striking lack of information on this and other species of nuts.
3. Systematic improvement by means of hybridization with the butternut and other suitable species.

A program such as this would yield information of great value and would probably establish the culture of this species on a sounder basis than it now is. Until this has been done the logical course to follow is to plant the best varieties in limited numbers in areas where the black walnut thrives and even in areas too cold for the black walnut. [Pg 45]

THE PRESIDENT: I have been connected with experiment stations and colleges for the past number of years but I was quite surprised to find such a general lack of knowledge of nut trees, and especially of this species. The members of the experiment stations who are here do not need to feel badly. My remarks wouldn't apply to them.

MEMBER: Any varieties of this that bloom late?

THE PRESIDENT: Yes, Mr. Gellatly of West Bank, British Columbia, has a variety that blooms rather late. J. U. Gellatly and his brother David have the best collection of Japanese walnuts in Canada, of heartnuts especially.

Professor Reed was to give us a paper on harvesting and marketing. We have just heard that his paper will be here tomorrow. The next paper is by Mr. F. O. Harrington. [Pg 46]

Prof. Colby wrote me some months ago asking if I would not write a paper for this meeting on "Fifty Years' Experience in Nut Growing." I answered that I had not been particularly interested in nut culture until within a few years, and that I believed I could be of more use to our members by telling them something of the care of scionwood.

I am going to tell you of my method used for thirty years constantly with only slight changes from the beginning. Any man who has had any experience knows that it is important that scionwood should be carefully kept, that it should not be kept in air so dry that the bark would shrivel to any appreciable extent, or, on the other hand, a still worse condition, where it is so damp that the bark will loosen and the buds start.

It is difficult enough in nut tree grafting to obtain reasonably fair success with the scions in perfect condition, where used in late spring, and it is something of a heart breaking proposition to try it with poor scionwood. To the nurseryman, with his winter grafting of fruit trees, the keeping of the scionwood long enough for his purpose in the cold of the winter season is no problem at all. It can be stacked in a pile in any cool cellar (not too wet) and covered over with leaves and blankets, or what not, and it is all O. K. for that period. It is a far different matter to hold small amounts of wood absolutely dormant through the changing conditions from winter to summer, and perhaps as greatly changed conditions of moisture through several months. And how shall this best be accomplished?

Ice house conditions are not, I think, generally very satisfactory. The right cold storage facilities might be satisfactory, but not readily accessible to most of us. I used to use boxes in the cellar, with careful packing with forest leaves and somewhat careful attention to moisture conditions, with penalties for lax attention always enforced.

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I know one nurseryman who, beside the regular nursery fruit tree grafting scion wood, kept many scions of nut trees. He had a deep outdoor cellar, or cave, which was always cool and not too dry. In this, in large boxes of sawdust, he kept his scions for spring use. Just how much attention as regards moisture conditions he had to give this I do not know, but through his knowledge and experience with it I think his scions were usually in good condition.

Now I will quote to you on the care of scions from J. F. Jones' paper on "The Propagation of Nut Trees" in the 1927 Report of the Annual Meeting of the Northern Nut Growers Association, page 104:

"It is not in the selection of scions that the beginner usually fails to make his grafting a success, but in handling the scions. Scions for grafting need not to be put in cold storage. In fact cold storage at the usual temperatures seems to be injurious to scions. Cool storage, that is temperature maintained below the freezing point, is O. K., but in my experience this is not necessary. We store them in a cellar with a ground floor. This is damp and cool and the cases the scions are stored in are without bottoms and set on the damp cellar floor. The cases are lined with tar paper or light roofing, both the sides and the lid. The latter is hinged for ease of getting out scions as needed. No packing is used around the scions and they draw enough moisture from the damp ground below to hold them plump and in good condition. Good scions stored in this way can be kept for weeks, or even months if need be, in excellent condition. Nut scions for grafting are soon spoiled if packed too damp, even if kept at temperatures considerably below that required to cause the sap to flow in trees outside."

Again I quote from Dr. W. C. Deming (1925 Report, page 48), "Top Working Hickory Trees for the Beginner":

"Scions packed away for any length of time are apt to go wrong, either by drying too much, by being too moist and starting to grow, or by heating, molding or rotting. A simple way to keep them is to dig a hole about three feet deep in the ground outdoors in a dry and sheltered place where water can never reach them, as under the back porch. Have the scions in convenient lengths of one to two feet. Wrap them in a bundle, or bundles, in a light tar paper, which helps to prevent mold. Leave the ends open for ventilation. Lay the bundles in the bottom of the hole and cover the top of the hole with an old carpet, or several newspapers. This description gives a general idea of the conditions under which scions should be kept. A man may vary it according to his own conditions, bearing in mind the principles. It is of vital importance to the success of grafting that the scions should be in good condition. The usual mistakes are in keeping them too wet and too much wrapped up. They should be examined frequently to see that they are keeping well."

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I have brought to your attention what have been considered the very best methods of keeping scionwood dormant and in best possible condition, and all agree that this is of vital importance for successful grafting. I will now call your attention to a better method than any of these, equally simple and inexpensive, and so much better in its action that scions may be kept by it two and three years in about the same condition as when severed from the parent tree; and to prove this statement I have here with me for your examination scionwood of several kinds of nut and fruit trees that have been kept in the Harrington graft box one year and two years. At the present time

I have no older wood in my graft box, for the simple reason that in the summer of 1928 the cover of the box, which had been in several years, rotted so that the top caved in, leaving it open to too much air, thus in time spoiling what wood was in it; and before putting in new wood in November I had to dig out the old box and replace with a new one. For wood will rot in time in the ground. I have had, at different times in the past, scionwood in my box three years old, much of it seemingly still good. I have not used any of it for grafting at three years, but I have with good success the second year old from cutting. I started experimentally with this method and box thirty years ago and there has not been a year since in which I have not used it, so you may readily understand that it is not an untried theory I am giving you. A much valued member of our society, J. F. Jones of Lancaster, Pa., now deceased, wrote me at one time, "You undoubtedly have the best method of keeping scionwood known at the present day," and Prof. Close, head of the Pomology Department of Agriculture, Washington, D. C., made the same statement to me.

My own box is located in an evergreen grove on dry land, but a shady position to the north of a building might answer fairly well. Until the last eight years my box was for a long period, under and between two large butternut trees growing out in the open, except at the northward. In my opinion it is highly desirable to cut and store all scionwood before severe temperatures of the winter occur, preferably between Thanksgiving and Christmas because very severe freezing is liable to produce some little injury to the cambium layer, at least in some years, and if that injury be even very slight it will usually spell failure when used.

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The graft box, as I am using it, is about thirty inches long by eighteen inches deep and fifteen inches wide. It has a solid cover but has a six inch square hand hole through on top in front, covered by a loose board lying flat and about ten inches square and butting back against a cross bar nailed across the box two inches back of the doorway opening. No bottom in the box but it has three cross bars nailed across inside to hold all scionwood up two inches from the earth floor. Any scion that touches the earth floor will either begin to grow or begin to rot. The box is entirely buried two to three inches under the ground except over the trap door. The spot must be perfectly drained. Over the box a space about six feet wide by seven feet long is insulated from temperature changes with straw packing to height, in center, of three feet and protected from rain by a wood roof of boards, shingles, or prepared roofing resembling, a little, the old wedge tent. To get into the box burrow in under by pulling out the straw in front, but not too large a tunnel, and far enough back to get at the trap door cover where it can be slipped off and scions put in, the door replaced and all the straw crowded back into place. Thereafter it is easy to slip the straw out and back to get at the box. In any case the packing is always carefully replaced, as the insulation of the earth near the box is of first importance.

Graft Box Air Conditions

The small amount of moisture coming into the box from sides and earth bottom, in ordinary conditions, seems to be very exactly balanced by the very small amount of dry air that finds ingress to the box from outside through the straw packing and the trap door, although after very long wet spells, at whatever season of the year, it has been my practice to bring all the scions out into the open air and allow both the scions and the interior of box to dry out for as long as seems needful. The reverse condition, that of too little moisture, I have never had to take notice of. Occasionally a little white mold in box and on scions may require a little open air treatment. No other condition seems to require any special care. I do not know how much larger a box than I have used would give equal satisfaction, for I have not demonstrated that feature, but obviously there must be at some point a limiting factor between the desired casualty of moisture and its opposite in the box. I am inclined to think that a box of double that capacity could safely be used, but advise that, where large amounts of scionwood are needed, more than one box be used until a test has been made with less valuable wood to find the size limit.

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DR. SMITH: You speak of airing the scions. How long do you do that?

MR. HARRINGTON: It depends on the conditions that require the airing. For instance a thaw in the winter, or a rainy spell. Again in the summer a long rainy spell. In these cases I open up the box, maybe leave it a couple of hours.

DR. SMITH: That kills the mold, two hours' exposure? You never sterilize the inside in any way?

MR. HARRINGTON: I never have. It might be a good idea. The mold doesn't seem to affect the scions.

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EXPERIMENTS AND OBSERVATIONS IN SEARCHING FOR BEST SEEDLING NUT TREES

J. F. Wilkinson, Indiana

Searching for the best seedling began long before the coming of the white man to America, by Indians and animals and the birds which store nuts for their winter food. This search has always

been continued through the nut growing territory by the crows, squirrels and other birds and animals.

Go to a pecan grove early in the fall when pecans are ripening and there is no better evidence that a tree is an early ripener and produces a thin shelled nut than to see a bunch of crows feeding from it.

The children living near a pecan grove in early fall will go where crows and birds are feeding to gather nuts that are dropped by them, and later, when all trees have ripened their nuts, these children have their favorite trees to gather from. I have seen the little ones around Enterprise, of before school age, that would have a preference and could select from a basket of pecans the ones from their favorite tree. It is surprising how good their judgment is.

The hunter also watches this in the early hunting season, going to the earlier ripening hickory and walnut trees, for it is there he will find the squirrels feeding.

My own experience in gathering pecans dates back to my first school days, for there were scores of pecans trees near the school building, and as soon as I was large enough to climb a tree I spent many days each fall gathering nuts and soon had a fair knowledge of all trees for a radius of several miles around.

The first trees of the now named varieties, the Indiana and Busseron, were located and brought to notice by the late Mason J. Niblack.

In the summer of 1910 my life-long friend, Mr. T. P. Littlepage, while on a vacation, was camping on the Ohio river near my home and was then very much interested in superior seedling nut trees. It was at that time, in a talk with him, that I became interested in the propagation of nut trees.

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At this time he took me with him to locate the "Warrick" tree which stands on Pigeon Creek in Warrick County, Indiana. The next day he, R. L. McCoy and myself went to the Greenriver grove where the Major and Greenriver trees were located. These are now being propagated and are considered outstanding varieties. Also a trip was made to Posey County, Indiana, where the Hoosier tree was located. This variety was soon dropped.

From that time on R. L. McCoy and myself kept up a constant search until he left Indiana in 1918. Since then I have done a lot of work along this line myself.

This work is carried on by arranging with nut buyers and gatherers in the nut growing localities to be on the watch for any unusually good nut and to send in a sample, with the name of the owner of the tree, or the party gathering the nuts, so the tree may be located later. Hundreds of samples have been received, the most of which were eliminated on examination of the nut itself. In the case of any that seem promising a trip is made to the tree for further information. Each fall I receive word of trees producing a superior quality nut and in most cases from the description given, whether it be by letter or a personal talk with the informer, one would believe that a really worthy tree had been found. But generally on investigation it proves to be only just above a good average tree.

A variety to be worthy of propagation must pass a rigid test. First, the nut must be of desirable size, thin shell, plump kernel, good flavor and good cracking quality, and last but not least the tree must be a good and regular bearer.

Accurate records on the bearing of these trees are very hard to obtain as they often grow in isolated places and their product is known to all in that neighborhood, and at least a part of the crop is often taken by some one who makes no report on the amount, so the best information to be had on this is often incorrect. When a promising tree is located the surest way is to visit it each fall for several years just before gathering time and see the crop on the tree.

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In almost every instance the size of a nut is exaggerated by the owner or informer unintentionally. They are honest but their imagination gets the better of their judgment. Then their knowledge is often limited to their own trees and those of their neighbors, and the nut they prize may be the best they know of, but when compared with nuts from a greater territory is found to be of only fair size.

The usual way one will describe the size of a pecan is to say it is as large as his thumb and about two thirds the length of his forefinger, and so thin shelled that two of them can easily be cracked in the hand with only a light pressure.

I usually carry some sample nuts of the named varieties on these trips for comparison and it is seldom that the owner or informer of a tree believes any of these to be larger than those produced by his favorite tree until a comparison is made, and then he will often declare they are not as large this season as usual.

This brings to mind many incidents which are very clear in my memory, one especially, when Mr. McCoy and myself had heard of the Kentucky pecan tree which is opposite Grandview, Ind. We went to Grandview to get first hand information on this tree from one who had gathered the nuts from it and while talking to the party he was trying to tell us how large the nut was. I first took a Busseron pecan from my pocket and he said it was much larger than that. I then resorted to some large southern ones none of which he thought were as large as his favorite. At last I produced a McAllister. After some hesitation he admitted it was larger than the Kentucky. At this Mr. McCoy

gave a hearty laugh and told him his imagination had the better of his judgment. Almost every one who owns any number of nut trees has one that is better than the rest, and naturally he prizes this one highly and wishes it propagated. I have traveled many hundreds of miles going to trees on reports of others, only to be disappointed. Where the tree is found to be promising and no bearing record is obtainable, then an annual trip for several years is necessary to determine the bearing record. These trips require time, expense and labor for very often a part of the trip has to be made on foot.

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Several years ago Claude Luckado, a professional pecan gatherer of Rockport, spent several weeks one fall in a large pecan grove on the Wabash river and brought back several samples of very promising pecans, one especially that I considered very worthy of further consideration. I reported this one to Mr. C. A. Reed, and a year or two later, when on a trip through this section in the fall, he suggested a trip to this tree. I arranged with Mr. Luckado to go with us to show us this tree, which is about seventy miles from Rockport. We left there on the first traction car for Mt. Vernon, Ind. From there we went in a Ford touring car without any top and only one rear fender and drove over nine miles of the worst roads I ever motored over to the Wabash river where we hired a motor driven mussel boat to take us four miles down the river. The remaining three miles we made on foot, reaching this grove about ten a. m., and searched until late in the afternoon without locating the tree. This day and trip I am sure Mr. C. A. Reed well remembers.

Two years later when roads and weather were more favorable, Mr. Luckado and myself left Rockport one morning at four a. m. and drove all the way to the grove, arriving there early in the morning and searching until late in the afternoon and again without results. But when one takes into consideration that this tree is standing somewhere near the center of an unbroken forest of hundreds of acres in which it has been estimated there are near 20,000 bearing-size pecan trees, it is some task to locate a certain tree, though the search for this tree will be made again.

It is very often that two or more trips are necessary to locate a tree and about nine times out of ten when the tree is found it is not considered worthy of propagation. Many amusing incidents and not a few hardships are remembered in these past experiences. During the past three years I have made four trips into southwestern Missouri and southeast Kansas where there are thousands of native pecan trees growing. Some trees in this section have been brought to notice which seem promising. I now have several promising new varieties under test and observation.

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The search for new and better varieties must be kept up, for no doubt there are yet unknown as good and possibly better trees than we have yet located.

DR. ZIMMERMAN: Have you ever known anything about the Marmaton, owned by J. E. Tipke at Rockwell, Missouri?

MR. WILKINSON: I have a sample of it.

DR. ZIMMERMAN: Mr. Tipke sent that to me. He told me it wasn't as good as others but he said it never missed a crop.

THE PRESIDENT: For the benefit of those who have not been down to Mr. Wilkinson's I would like to say you will find it very worth while to go there. In 1925 Mr. Wilkinson invited me to go with him through southern Indiana, to see some of the large pecan trees he had there. When I got there I really had to take two looks to see the top of some of those trees. I found one tree that I would have to make three spans, in this manner, to get around. One tree is said to be 125 feet tall and 16-1/2 feet around. After visiting that section and seeing the very many interesting trees I concluded that Mr. Wilkinson really hadn't told all that was to be told. Mr. Wilkinson is a very modest person. When he tells you a certain thing you can make up your mind he is not exaggerating in the least.

MR. WILKINSON: Many times in determining the crop we have to climb the tree. For instance, the Major is 65 feet to the first limb. It is very often necessary to climb the tree to make an estimate of the crop.

THE PRESIDENT: Wasn't there one tree there with a spread of 125 feet?

MR. WILKINSON: This was in Greenview. That was the largest pecan tree known in Indiana, 70 feet to the first limb, just a straight column. The spread of the top was 140 to 150 feet. The wind blew the tree down.

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MR. HERSHEY: That tree according to Mr. Wilkinson never missed a crop. While I was there they took me to a tree that had 600 pounds one year. It was on a cheap piece of land that was bought for \$425.00. The year we were there it produced 250 pounds, a light crop. Another lady told us of a family that bought a piece of land that had about 50 pecans scattered over it. That kept them in ample supply of money and they didn't have to do much more to make a living.

THE PRESIDENT: The next is a report by Dr. J. H. Kellogg. Mr. Kellogg is not able to be with us and Dr. Colby will now read it.

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MORE NUTS—LESS MEAT

Dr. J. H. Kellogg, Michigan

The oft reiterated appeals to the American public to "Eat more meat to save the livestock industry" and exploitation of a so-called "all-meat diet experiment" by Stefansson and Anderson, justify the presentation of the special claims of other foodstuffs, so that those who desire to regulate their eating in accordance with their bodily needs, rather than to meet the exigencies of business, even to aid a declining industry, may have a fair opportunity to judge comparative merits and draw sound conclusions based upon scientific facts, rather than misleading statements or the biased dictates of custom.

If the American people are really suffering for lack of meat the efforts of the Meat Board of Chicago should be regarded as a noble philanthropic effort to correct a national fault and to avert the dire consequences of the physical collapse which must necessarily result from a deficiency diet. But if it is not true that the average American eats less beefsteaks, chops, sausage, etc., than he needs, but as a matter of fact is actually suffering notable injury because of the great consumption of flesh foods of all sorts, then this persistent appeal to the American stomach to render economic service as well as to do its work of digestion, is not only a most extraordinary business anomaly but a grave menace to the health and welfare of the American people.

The discussion of this question is germane to the objects of this convention, since nuts are the vegetable analogues of meats, and hence we cannot reasonably ask nor expect that more nuts will be eaten simultaneously with an increased consumption of meat. And so I shall undertake to give in this paper some of the reasons why we may properly urge the people of this country to eat more nuts and less meat.

Nut meats are the real and original meat. Says Prof. Henry C. Sherman, of Columbia University in his admirable textbook, "Food Products":

"To speak of nuts as 'meat substitute' is natural under the present conditions and reflects the prominence which has been given to meat and the casual way in which nuts have been regarded for some generations. Looking at the matter in evolutionary perspective, it might be more logical to speak of meats as 'nut substitute' instead."

Evidently Professor Sherman believes, as do many other eminent scientists, that nuts were a staple in the diet of primitive man. Professor Elliot, of Oxford University, in his work, "Prehistoric Man," calls attention to the fact that in the early ages of his long career, man was not a flesh eater; and the famous Professor Ami, editor of the *Ethnological History of North America*, and other paleontologists, hold that man began the use of meat only after the glacial period had destroyed the great forests of nut trees on which he had formerly feasted.

This, however, likewise agrees with Holy Writ. We read in Genesis 1:29: "And God said, behold I have given you every herb yielding seed, which is upon the face of all the earth, and every tree, in the which is the fruit of a tree yielding seed; to you it shall be for meat." So the real meat grew on trees and herbs. Beefsteak and chops are poor substitutes for the real meat, which still constitutes the food of the human race, for with the exception of the Anglo-Saxon race and a few savage tribes, meat forms no substantial part of the human diet. The teeming millions of India and China, which constitute nearly half of the whole human race, eat practically no meat. The thronging millions of Central Africa thrive on corn, nuts, bananas, peanuts, manioc, sweet potatoes and melons. The same is true at the present time of the natives of Mexico, Central and South America, who find in maize, beans, potatoes and various tropical fruits ample and satisfying sustenance.

The average American consumes 165 pounds of meat a year; the Japanese, four pounds; the people of South China less—practically none at all. Taking the human race as a whole, meat fills only a very insignificant place in the world's bill of fare. Bread is the staff of life, and nuts, the real meat, are gradually recovering their old prestige. It is only in comparatively recent years that meat has entered so largely into the bill of fare of civilized nations. Major J. B. Paget, a writer in the *English Review*, calls attention to the fact that there has been in England a deterioration in stature and otherwise since the Peninsular War, the reason for which he thinks "is not difficult to discover. We are the same race with the same climate and the same water. The only difference is our diet."

According to Wellington's Quartermaster General's Report, the rations of the men who fought the Peninsular War under the Iron Duke, was one pound of wheat per day and a quarter of a pound of goat's flesh. But they had to catch the goats who ran wild in the mountains and so they seldom got that part of their ration.

According to General Sir William Butler these soldiers were "splendid men with figures and faces like Greek gods." And he adds with regret, "Such men have passed away."

Major Paget tells us that the Spaniards were greatly impressed by the fine teeth of these English soldiers and especially of their wives who accompanied them. Of their diet the Major says:

"These men before they enlisted were nearly all agricultural laborers who were brought up on a hard, wholemeal bread, garden produce, and apparently very little meat, as the consumption of

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meat was then *three pounds per head per annum.*"

It is to be remembered also that nuts form a substantial part of the diet of that large and interesting family of vertebrates, the primates, represented by the gorilla, the chimpanzee, the orang-utan and the gibbon, animals that do not eat meat, and that man is also a primate. No authority has ever offered any reason why man's diet should differ from that of other primates.

Man is not naturally a flesh-eater. Infants usually evince a dislike for flesh when it is first given them.

Adults who use flesh foods are attracted by their flavors rather than by the nutritive elements which they supply. As a matter of fact, more and better food material is supplied by plant foods and at a far less cost.

Meats are notably deficient in vitamins, while nuts are rich in vitamin B, some, as the hazel nut, containing one-fifth as much as dry yeast. The precious vitamin A, found in only very meager amounts in meats, is found in the almond, the pine nut, coconuts and peanuts.

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The minerals, too, are found in better proportions and in larger amounts in nuts than in meats.

The deficiencies in essential elements in a lean meat diet are so pronounced that when Chalmers Watson fed rats on meat they became deformed and sterile, their mammary and other sex glands degenerated and in three generations they ran out completely. Watson attributes the steady and very pronounced lowering of the birth-rate in Great Britain to the increased consumption of meat in that country, which has risen in a little more than a century from 3 pounds to more than 100 pounds per capita, while the birth-rate has fallen until it closely approximates the mortality rate. The same thing has happened in the older sections of this country, especially the New England states.

According to Newburgh, of the University of Michigan, the large consumption of meat in this country may be responsible for the high death rate from Bright's disease, which is mounting higher every year. And the same is true of diseases of the heart and blood vessels, which now claim more lives annually than any other cause. He finds that when rabbits are fed meat meal mixed with flour in bread, they soon become diseased through changes in the bloodvessels and die of old age before they are a year old.

Hindhede, of Copenhagen, a physiologist of world-wide renown, and food commissioner for Denmark, in a notable paper read before the Race Betterment Conference at Battle Creek, January, 1928, remarked as follows:

"One notices the terrible death toll in America due to Bright's disease. I can no longer doubt that the high meat diet ruins the kidneys, especially in view of Dr. Newburgh's experiments, proving as they do that we may, with mathematical certainty, produce Bright's disease even in rats by placing them on a high meat diet.

"I feared that you might doubt my statistics, and might consider me merely another 'crank,' so I placed my figures before Dr. Sundwall, Professor of Hygiene of the University of Michigan, and asked him to check their correctness. Dr. Sundwall and Dr. Newburgh recalculated the data, and authorized the publication."

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Hindhede found the number of deaths per 100,000 from six causes—alcoholism, apoplexy, disorders of digestion, cirrhosis or hardening of the liver, nephritis (Bright's disease), and diabetes—to be in this country 255 and in Denmark on a low meat diet, 112. He calculates that the adoption in this country of the Danish diet, which would eliminate more than half our meats, would save the lives of not less than 200,000 of our citizens annually. And yet there are vested interests which continually clamor for the increased consumption of meats. Fortunately the American people are becoming enlightened on the subject of diet and are using less meat and more green vegetables, with less bread and cereal breakfast foods and more milk and potatoes.

Nutrition researches are daily teaching us new lessons in dietetics, some of which are of commanding importance. One of the most significant of these is the necessity for taking account of the nature of the ash left by a foodstuff in the body. There are basic or alkali-ash foods and acid-ash foods. Foods of the latter class when freely used cause acidosis. Meats are high up in the list of acid-ash foods. It is for this reason that such animals as the lion and flesh-eating men have little endurance. The American team made a poor showing at the last International Olympic meet, in the writer's opinion because of their excessive meat-eating. According to Roosevelt, a vegetarian horse, with a heavy man on his back (Teddy), was able to run down a lion in a mile and a half.

Thousands of short-winded, asthmatic people who are tired all the time and take cold at every change of the wind and think they are overworked because they find it so hard to work, are victims of acidosis from a heavy meat diet. If such persons will eliminate meat from their diet and add a pint of milk or buttermilk, they will experience an immediate physical uplift which, in some cases, will seem almost incredible.

Meat contains poisons, the natural wastes of the body. By its use, the labor of the kidneys is more than doubled.

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Besides, fresh meats are always swarming with bacteria, and not the harmless sort that are found in buttermilk but the pernicious germs which have their headquarters in the colons of animals. Meats always become infected with these filthy colon germs in the process of slaughtering and the longer it is kept the more numerous the colon germs become, for they multiply amazingly fast, and this is the reason the meat becomes more tender when "hung" for a long time.

I was consulted not long ago by the manager of a large popular hotel who wanted suggestions about feeding his guests. I recommended special care in the selection of meats and the choosing of that which had been most recently killed.

"Oh!" said the manager, "my chef is on to that. He is very particular. You know our hotel meat usually has a beard of green mold on it an inch long. My chef is very careful. He never allows the beard to be more than a quarter of an inch long."

Another hotel manager told me they often had to cut away nearly half of the meat because it was so green and rotten.

This is not pleasant information but it is simply commonplace, every-day fact. Sausage, hamburger steak and "game" with a high flavor, are little if any better than carrion, and the poisons which such foods introduce into the body must all be detoxicated by the liver and eliminated by the kidneys, and thus they are worn out prematurely by overwork.

"As sweet as a nut," is an old bon mot which hides no such repulsive picture. The nut, inside its germ-proof shell, is solid nutriment of the purest sort, the very quintessence of nutrient value, sunlight in cold storage. The nut represents food energy in its most delectable and concentrated form.

From an economic standpoint, the nut leaves flesh foods so far behind that they are almost out of sight.

Experiments to determine the digestibility and nutritive value of nuts were conducted several years ago by the eminent Professor Jaffa of the University of California. His researches conducted over many months, using human volunteers as subjects, showed that nuts were well digested and created no intestinal disturbances. Later experiments confirmed and extended the observations of Professor Jaffa. These experiments, conducted by Professor Cajori of Yale University in the Yale laboratory and in the laboratory of the Battle Creek Sanitarium, have finally definitely settled the question.

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Says Professor Cajori, with reference to his results: "A few years ago a rather extensive series of digestion experiments were inaugurated at Yale University in an effort to settle the question of the indigestibility of nuts and also to test out some of the commercial nut products to find what effect roasting, boiling, and other processes that nuts are subjected to had on their digestibility. Through the courtesy of Dr. Kellogg of Battle Creek, it was possible to follow up these experiments with a series at Battle Creek. It is of the result of these tests that I wish to speak."

"Our digestion experiments show the following results: For protein digestion of nuts—almond 89%, pecan 84%, pine nut 89%, English walnut 83%, Brazil nut 88%, and coconut 88%."

"How, then, explain the undoubted discomfort that many people experience after eating nuts? I believe the explanation rests on the fact that our common American way of eating nuts is not the rational way. We would not consider topping off a heavy meal with eggs, meat, or cereals, or eating these in large quantities between meals without realizing that we were exposing ourselves to possible digestive discomfort. No more, then, can we expect to eat nuts, which are even more concentrated or "heavy" than meats or eggs, merely as an adjunct, without occasional discomfort. Unpleasant results from so eating does not condemn the nut as indigestible; rather it condemns our mode of using that nut. Further, we must recognize that a nut is a hard compact substance, and that unless completely masticated is not readily penetrated by the digestive juices of the alimentary canal. This was very well brought out in our experiments with dogs. The dog bolts his food and where there were large fragments of the nuts in the food they appear unchanged in the feces, while if the nut was ground fine before feeding it was readily digested. Comparisons of nut butters and nut pastes with the whole nut also brought out this point. The completely comminuted nut butters showed consistently higher degrees of digestion than the whole nut."

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Nuts should be used as a food staple, a major element in the bill of fare, rather than as a dessert, and special care must be taken as to thorough mastication, which is almost equally true of apples, bananas and numerous other fruits which possess a firm flesh.

To overcome the objection that some people are unable to masticate nuts properly on account of defective teeth, and to insure the proper assimilation even if not properly chewed, the writer some forty years ago conceived the idea of converting the nuts by crushing and grinding into a paste, in other words, chewing the nuts by machinery. The peanut was first utilized in this way and rapidly won its way to public favor. Now, many scores of carloads of that nut are eaten under the name of "peanut butter."

Almonds were next used, and were found to make a delicious nut paste, or butter, which by the addition of water and a little salt, became a most delicious cream. In the form of almond cream or milk nothing could be conceived in the way of nourishment which the body can more easily

appropriate and more fully utilize.

As regards the necessity for eating meat, this question was definitely settled by the Inter-allied Scientific Food Commission which met during the war, without doubt the most authoritative body on the subject of food and nutrition that was ever brought together.

The question of a minimum meat ration was discussed by the Commission, and it was decided to be unnecessary to fix a minimum meat ration, since, in the words of the commissioners in their report, "no absolute physiological need exists for meat, since the proteins of meat can be replaced by other proteins, such as those contained in milk, cheese and eggs, as well as those of vegetable origin."

Quite in line with this official action was an editorial in the *Journal of the American Medical Association*, which states that "man's health and strength are not dependent on the assumed superior virtues of animal flesh as a dietary constituent."

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A supreme advantage of nuts over meats is that they are absolutely free from any possible taint of disease. Those delectable foods, the walnut, the pecan, the hickory nut and the almond, are never the vehicle for parasites or other infections. Nuts are not subject to tuberculosis or any other disease which may be communicated to human beings.

Speaking of his childhood diet, Professor Stephen Mizwa says: "We had chicken, too, but I rarely tasted one unless I was sick and the chicken was sick." The voluntary eating of sick animals may be less common in this country than in Poland, but the eating of the flesh of diseased animals may nevertheless be much more extensive.

Within the year 1918 there were slaughtered in the United States a hundred million beeves, sheep, pigs and goats, one whole beast for every man, woman and child in the United States. Of this vast multitude of animals the Federal inspectors examined nearly two-thirds (60,000,000) and found one and a half per cent so badly diseased that the whole or part of the carcass was condemned. In other words, nearly a million (900,000) carcasses were found seriously diseased. But there were 40,000,000 other beasts killed and eaten which were not inspected; and they were without doubt much more badly diseased, a fact which was in many cases, most likely, the reason why no inspection was made. Allowing that three per cent of these were diseased, which is a low estimate, the total number of diseased animals found in the 100,000,000 slaughtered was not less than 2,000,000, or one in fifty of the total number. And most of these were eaten by human beings either wholly or in part.

If we should abandon meat eating in favor of nuts we would not have to worry about what our victuals died of.

By the substitution of nuts for meats all dangers associated with flesh eating may be avoided; hence their use should be encouraged in every practical way. National and state legislators should make liberal appropriations for the study of the soil and climatic conditions best suited to nut culture, and otherwise encourage this infant but most important industry.

MR. BRICKER: Have any of you come in contact with a black walnut, seemingly deformed, in which there is only one lobe in the shell?

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THE PRESIDENT: Dr. Deming, what is your observation of the Stabler with one lobe?

DR. DEMING: 50% are one lobe.

MR. HERSHEY: Mr. Bixby found, I think, 60%. We don't know why there should be nuts with one lobe.

DR. SMITH: In my observation of the Stabler, the percentage of one lobe nuts is very small, not more than 5%.

MR. BRICKER: Also there is a large black walnut at Atalissa, with a very thin shell. I have seen some of them, however, that were not very well filled last year.

THE PRESIDENT: Is that a little town in Iowa?

MR. BRICKER: Yes. Below Iowa City, east of West Liberty.

THE PRESIDENT: Mr. Wilkinson has something interesting to tell us about the discovery of a black walnut valued for its lumber.

MR. WILKINSON: Possibly Professor Smith knows more about that than I do. The first I knew of it Mr. Lamb wrote that he had found an unusual figured walnut. He had already sent scions to Dr. Morris and Mr. Bixby, and Dr. Morris suggested he send me some. When the log came Mr. Lamb found it unusually highly figured. He traced it to where it was loaded. They went to the fields and chopped into the tops until they found the tree by the figure of the wood. It had been cut two months and the wood was entirely dry. Mr. Bixby sent me two very tiny grafts. The tree sawed out something over 60,000 feet of veneer that sold from 16 to 18 cents per square foot; quite a large tree. It sawed out five logs and the stump sawed out 500 feet. Several thousand dollars for the tree. I saw several pieces of the tree last year. The most beautiful thing I ever saw. Most

highly figured log that ever came into the mill at Chicago.

DR. ZIMMERMAN: Prof. Lake sent me scions named the Lion.

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DR. DEMING: The figure is not in the scion wood.

DR. ZIMMERMAN: The scion wood I put on was quite curly.

DR. SMITH: Does the curly character show in the sap wood or the heart?

THE PRESIDENT: You have to go away from home to know what is going on there. It is the first I have known about that very interesting tree. I would like to get some trees of that curly type. Mr. W. K. Kellogg is very much interested in having us propagate that type.

DR. ZIMMERMAN: Mr. Link told me Mr. Linton had some.

MR. HARRINGTON: It seems to me very strange that the stump didn't sprout.

MR. WILKINSON: The stump was used.

DR. DEMING: There must have been roots.

THE PRESIDENT: Sometimes it is difficult to get them to grow.

MR. WEBER: Three miles northwest of Blufftown there is a natural hybrid between the white and chinquapin oaks. There are some samples out on the table. We picked up some of the nuts and found them edible. No trace of any bitterness whatever. You come out of Blufftown on No. 30. About a half mile above the town you turn to the left and go about a mile or more. It is at the intersection of the Erie Quarry road. It has a wire fence around it.

DR. SMITH: How do you know it is a hybrid?

MR. WEBER: From Richard Leber. It was discovered by a man by the name of Williamson, and he suggested that the state acquire the land in order to preserve the tree.

DR. SMITH: It will be another source of carbo-hydrate food.

THE PRESIDENT: Dr. Zimmerman is a specialist on chestnut blight, and particularly on inducing immunity.

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INDUCED IMMUNITY TO CHESTNUT BLIGHT

Dr. G. A. Zimmerman, Piketown, Pa.

Several years ago I started out to get rid of the chestnut blight. On several occasions before this notable body I told of the successes and failures I had encountered, still believing that I was on the right road and insisting that an antigen would be absorbed in sufficient amount to stimulate immunity. Science has since vindicated that assertion and men are now injecting all sorts of chemicals, and even dyes to stain the grain of the wood.

I have been very cautious in the past and perhaps should be more so now, in view of the fact that only a comparatively few years have elapsed since I began my work on plants. Still, after having used vaccines on human beings and animals for twenty-one years, and observing that plant life reacts to an antigen in a similar manner, I am at least entitled to the same conclusions. This gives me an opportunity of knowing years in advance just what to expect.

While my work is still going on as an experiment I have no hesitancy in saying that I can and have put as much active immunity to the blight into the chestnut in five years as nature has been able to place in perhaps four or five thousand years by her usual method. However it is only fair to state that such results cannot be accomplished by mere oratory. Injections must be made and the antigen must go into the plants, not in single doses, if you please, but by the thousands.

In recent years there has been considerable discussion relative to the chestnut coming back. This simply means further delay. The chestnut will come back but not before from 25 to 150 years yet. There are few roots that will stand mutilation for that period, and the few plants that do survive will have taken the shrub form like the chinquapin, and the nuts will likely be as insignificant. I have plants from a tree that holds as much immunity in the natural way as any I know, being rated at 2X, and these plants have inherited an immunity equal to the parent, no more and no less. I have, however, a lot of seedlings from Paragon and Champion trees rated at from 6X to 7X. These seedlings may confidently be expected to perform as their parents and produce many plants of equal resistance.

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I shall not discuss the antigen or its method of administration. That has been covered rather carefully in former papers. I do want to say a word, however, about root stock. In a blight region it is preferable to have chestnuts on their own roots. The nearest to own-rooted plants is a graft on their own seedlings. The Chinese and Japanese chestnut in my hands has made a very poor root stock for the American chestnut or its hybrids. The European chestnut is only fair, with the chinquapin somewhat better, but having the disadvantage of being troublesome to get from the

seed. The American chestnut, or its American hybrids, is by far the best, providing we can get one with immunity. I think the Rochester will shortly fill this need.

The chestnut oak has made a rather interesting stock for a few varieties, notably a Chinese and 20 No. 3, a native American chestnut sent to me from Bloomsburg, Pa. I now have a few of these double grafted with other varieties.

I might say that I am no longer interested in any chestnut, no matter how resistant it may be, unless the nut is of large size and fine quality, because I can immunize a plant bearing a good size, fine quality chestnut much easier and in a shorter time than one can be developed through hybridization from an inferior nut. I am usually, like most folks, looking for the path of least resistance.

My work has been a good deal divided during the past few years because, while I started out with the chestnut alone, now I am carrying a dozen other fruits, nuts and berries.

In closing let me state that my principle of induced immunity is sound and the procedure feasible and practical.

THE PRESIDENT: About the result of grafting the chestnut on a species of oak. How long have these scions been growing?

DR. ZIMMERMAN: About three years.

MR. HERSHEY: How long?

DR. ZIMMERMAN: This is not the oak that I had reference to when you were up there. These are about three years old. I think they grow a little better than on the chestnut. Many of them died. I have another scheme now; that is grafting the scions as high as I can. Get them united and then bend them over and get them to root. Some are doing nicely, others have died.

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DR. SMITH: I think you complimented us by thinking we could follow you. Do you intend to vaccinate the chestnut and make it immune and then expect it to transmit that immunity in its seed? Have you checked up in the second generation?

DR. ZIMMERMAN: I haven't had time yet.

DR. SMITH: Thus far you have established immunity in the living tree?

DR. ZIMMERMAN: Yes, and I have a bunch of seedlings now from nuts from immunized trees that I planted last spring. I have 200 of those. I expect them to inherit immunization from their parents.

DR. SMITH: We vaccinate each generation of youngsters.

DR. ZIMMERMAN: I was speaking of the experiments with guinea pigs.

DR. SMITH: Isn't smallpox vaccination against your theory?

DR. ZIMMERMAN: I don't think so. They are doing it with other things. I found a human being giving the reaction for typhoid for seventeen years after he had been immunized.

DR. SMITH: Have you any evidence for or against the decline of immunity in the tree?

DR. ZIMMERMAN: I think it will decline.

DR. SMITH: Then we have got to keep on immunizing like spraying. I didn't mean necessarily annually. I mean perhaps it is not a permanent achievement.

DR. ZIMMERMAN: I imagine that the tree will be sufficiently attacked by blight to keep the immunity up. It is wise to have it attacked once in a while.

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MR. HERSHEY: Isn't this only carried on until you get natural resistance?

DR. ZIMMERMAN: I know that it will be a long time before I can have chestnut trees to produce like Mr. Harrington's. But I am going ahead. I can't wait 17 years. All I need is some time and I will produce chestnuts of the finest varieties, as Mr. Harrington has.

DR. SMITH: How long will it take?

DR. ZIMMERMAN: They will hold their immunity as well as the Chinese. The ones I have are worth planting right now. I have trees that are standing up better than any Chinese chestnuts are. It takes a long time before the immunizing principle is so disseminated that every part of the tree will have an equal resistance. I can easily see that by cutting off a scion and grafting it I may get hold of one that has not had its immunization distributed as it should be.

DR. SMITH: A fairly ignorant man can take machinery and spray an orchard. Can he do the same with immunizing?

DR. ZIMMERMAN: No sir, he can not.

DR. SMITH: Perhaps I should not have used the word ignorant. A farm hand can spray and make a pretty good crop of apples.

DR. ZIMMERMAN: No, he can't do it. It hasn't been easy. I have run into all kinds of obstacles. As soon as I injure the stock a little bit the blight takes it. As soon as I can raise them on their own roots it will be all right. That will come.

DR. SMITH: Have you seen chestnut grafts root as the apple does?

DR. ZIMMERMAN: Yes, right below the surface. A couple of them were that long. They will send out roots. Then I have noticed on some, that at the place where I grafted the callus got quite large. It got too dry and died off. I have never rooted American chestnut cuttings. I have rooted some Chinese chestnuts.

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THE PRESIDENT: Some of the Chinese chestnuts root quite readily from those small shoots that come up from the ground. I conducted a little experiment in trying to propagate the Chinese chestnuts by cuttings. I made 144 cuttings. They all dutifully and beautifully died. I don't mean to say that the Chinese chestnut cannot be rooted by cuttings.

DR. ZIMMERMAN: I noticed one chestnut that was toppling over and the leaves were withering. The rats had taken it off just below the ground. I couldn't find a root anywhere, but it was callused. I cut it back and planted it again. It must have roots now for it is still green. Otherwise it wouldn't live this long.

THE PRESIDENT: Your experiments are of very great interest. If you are successful you will deserve the gratitude of this and future generations.

MR. HARRINGTON: Do you remember when we were down at the Riehl nursery that we ran into a chestnut that produces 7 to 9 in a burr?

THE PRESIDENT: I remember one tree that had a great many nuts.

MR. HARRINGTON: I had one with 7 nuts and they said there were some with 9. Was that the one named Gibbons?

DR. COLBY: That has three nuts to the burr.

DR. DEMING: Dr. Colby, there have been two instances of blight infection in Illinois. Could you tell us how the eradication was done?

DR. COLBY: In each case the tree was burned and the disease entirely eradicated by fire on the spot.

THE PRESIDENT: Dr. Colby has a paper from Mr. Littlepage on the plant patent law.

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"PLANT PATENT ACT"

By Thomas P. Littlepage, District of Columbia Bar, Washington, D. C.

The plant patent act is an effort by Congress, as stated in the Committee reports on this bill, "to afford agriculture, so far as practicable, the same opportunity to participate in the benefits of the patent system as has been given industry, and thus assist in placing agriculture on a basis of economic equality with industry." The act is rather short and is set forth below:

[PUBLIC—No. 245—71ST CONGRESS]

[S. 4015]

An Act To provide for plant patents.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That sections 4884 and 4886 of the Revised Statutes, as amended. (U. S. C., title 35, secs. 40 and 31), are amended to read as follows:

"SEC. 4884. Every patent shall contain a short title or description of the invention or discovery, correctly indicating its nature and design, and a grant to the patentee, his heirs or assigns, for the term of seventeen years, of the exclusive right to make, use, and vend the invention or discovery (including in the case of a plant patent the exclusive right to asexually reproduce the plant) throughout the United States and the Territories thereof, referring to the specification for the particulars thereof. A copy of the specification and drawings shall be annexed to the patent and be a part thereof.

"SEC. 4886. Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvements thereof, or who has invented or discovered and asexually reproduced any distinct and new variety of plant, other than a tuber-propagated plant, not known or used by others in this country, before his invention or discovery thereof, and not patented or described in any printed publication in this or any foreign country, before his invention or discovery thereof, or more than two years prior to his application, and not in public use or on sale in this country for more than two years prior to his

application, unless the same is proved to have been abandoned, may, upon payment of the fees required by law, and other due proceeding had, obtain a patent therefor."

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SEC. 2, Section 4888 of the Revised Statutes, as amended (U. S. C., title 35, sec. 33), is amended by adding at the end thereof the following sentence: "No plant patent shall be declared invalid on the ground of noncompliance with this section if the description is made as complete as is reasonably possible."

SEC. 3. The first sentence of section 4892 of the Revised Statutes, as amended (U. S. C., title 35, sec. 35), is amended to read as follows:

"SEC. 4892. The applicant shall make oath that he does verily believe himself to be the original and first inventor or discoverer of the art, machine, manufacture, composition, or improvement, or of the variety of plant, for which he solicits a patent; that he does not know and does not believe that the same was ever before known or used; and shall state of what country he is a citizen."

SEC. 4. The President may by Executive order direct the Secretary of Agriculture (1) to furnish the Commissioner of Patents such available information of the Department of Agriculture, or (2) to conduct through the appropriate bureau or division of the department such research upon special problems, or (3) to detail to the Commissioner of Patents such officers and employees of the department, as the commissioner may request for the purposes of carrying this Act into effect.

SEC. 5. Notwithstanding the foregoing provisions of this Act, no variety of plant which has been introduced to the public prior to the approval of this Act shall be subject to patent.

SEC. 6. If any provision of this Act is declared unconstitutional or the application thereof to any person or circumstance is held invalid, the validity of the remainder of the Act and the application thereof to other persons or circumstances shall not be affected thereby.

Approved, May 23, 1930.

It is admitted by all who understand anything about horticulture that this act is intended to meet a long-felt want. The world owes much to many hard working scientists who have developed many valuable plants, both ornamental and edible, and up to the date of this act such producer had no way of reaping any very material financial benefit from his labors. The man who might invent some new and useful gadget for an automobile or other machinery was protected under the patent law, if he availed himself of it, but the man who developed a beautiful flower, a fine apple or a fine nut was wholly without protection.

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The term "asexually" as used in the act, is generally understood by horticulturists to mean any method of producing a plant except from seed. It will be observed, in referring again to the act, that the man who discovers some new plant and propagates it by any of the methods covered by the term "asexually" can have such plant patented under the terms of this law, but the patent law is one that is always construed strictly and obviously the application for patent would have to be made in the name of the man who actually discovered the plant. Of course, after securing such patent, he could assign it the same as any other patent is assigned, but the question would constantly arise in this connection as to who actually was the first discoverer. Most of the sporadic fine plants, especially fruit and nut bearing trees, were matters of neighborhood knowledge many years before they actually attracted the attention of some one who recognized their full value and knew how to propagate them, and the question would arise immediately as to who was the real discoverer. Undoubtedly the man who tramped constantly around in the neighborhood of a fine nut or fruit tree and actually saw the tree but did not recognize its value, is like the man the poet describes when he said:

"A primrose by the river's brim,
A primrose only was to him,
And nothing more."

This man could not be said to be a discoverer under the terms of this law; but on the other hand the plowman who might be plodding his weary way homeward and see a fruit or nut tree bearing something unusual and who would recognize its unusual and distinct differences would be the real discoverer, but unless he could prove the fact that he had called it to the attention of others in some manner he would have difficulty in complying with the patent law and making a proper showing of originality as required by that law. But he would also, in addition to being the discoverer, have to asexually reproduce it and this he might not be able to do on account of his lack of knowledge of propagating methods.

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The language of the law presents some very interesting problems to those of us who have tramped the fields and valleys in search of nut trees producing better nuts than those already propagated, and it incidently brings into the patent practice a brand new requirement. The ablest patent lawyer in America might not know the difference between a bud and a graft, a layer or cross-pollination. I have frequently had some very able lawyers who visited my farm and had their attention called to a pecan tree grafted onto a hickory, ask what kind of nuts it would bear. Of course when they ask such questions as that I promptly change the subject and begin to talk

about the weather or something else; I certainly do not try to educate them in the fundamentals of tree propagation. It will also require specialists in the patent office who likewise know something of horticulture and reproduction methods of plants.

It will also be noted that the law excludes tuber-propagated plants. The Committee report states that:

"The bill excepts from the right to a patent the invention or discovery of a distinct and new variety of a tuber-propagated plant. The term "tuber" is used in its narrow horticultural sense as meaning a short, thickened portion of an underground branch. It does not cover, for instance, bulbs, corms, stolons, and rhizomes. Substantially, the only plants covered by the term "tuber-propagated" would be the Irish potato and the Jerusalem artichoke. This exception is made because this group alone, among asexually reproduced plants, is propagated by the same part of the plant that is sold as food."

It will be noted that there is quite a spread, however, between the exact language of the law and the Committee report, for example: under the law it would appear that a dahlia might be excluded, and it also raises the question, under the language of the law, as to many of the root plants, such as peonies and others. Obviously, Congress did not intend to exclude plants such as the dahlia, peony and others, as evidenced from the excerpt in the Committee report above quoted, and whether the matter of the production of a new dahlia by cross-pollination and tested out through the growth of the bulbs, can be made to harmonize with the language of the law is the question. The Committee report says that tubers mean only "Irish potatoes and Jerusalem artichokes." It always occurred to me that the sweet-potato is also a tuber, but the Committee report apparently attempts to exclude it.

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There are any number of interesting questions that occur to those of us who are fortunate enough to have some knowledge of the law as well as a few fundamental principles of horticulture, but in spite of whatever weakness the law may or may not have, it is undoubtedly a step in the right direction, and meets a long-felt want.

The Secretary of Agriculture said in his letter to the Committee:

"The proposed legislation would appear to be desirable and to lend far-reaching encouragement to agriculture and benefit to the general public."

Thomas A. Edison, who is also quoted in the Committee report, said:

"Nothing that Congress could do to help farming would be of greater value and permanence than to give to the plant breeder the same status as the mechanical and chemical inventors now have through the patent law. There are but few plant breeders. This (the bill) will, I feel sure, give us many Burbanks."

It is certainly to be hoped that many of those interested in northern nut culture, as well as in fruits and ornamentals, will avail themselves of the privileges of this bill to give us something better. We are not satisfied with our varieties today and should not be. The greatest problem in nut culture, as well as fruit and ornamentals, is the question of variety. It will also be the most important question a hundred years from now, but the man who produces these better varieties should do so with the knowledge that under this law the fruits of his labor will be protected and he will at least have the same opportunity to receive remuneration therefrom as the inventor of a gadget.

DR. COLBY: I have talked with a number of men interested in the law. While they agree that it is a step in the right direction they feel that it will be a rather difficult thing to administer it. Plants differ from other objects or things or "gadgets" and considerable experience will be necessary on the part of the administration before the law will be made workable.

A banquet was held at the Hotel Montrose on the evening of September 17 at which about forty members and guests were present. The menu follows, and it will be noted that nuts were featured:

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- Canape, Montrose
- (Dates stuffed with Nuts)
- Iced Celery
- Mixed Nuts
- Queen Olives
- Soup, Rothschild
- (Garnished with Chestnuts)
- Roast Young Capon Stuffed, Hickory Nut Dressing, Jelly
- Au Gratin Potatoes
- Puree of Chestnuts, Baked
- Frozen Fruit & Nut Salad, Cream Nut Dressing

- Wafers
- Hot Parkerhouse Rolls
- Black Walnut Ice Cream
- Nut Layer Cake
- Coffee

After the banquet the President spoke as follows:

Once upon a time I read a poem, which unfortunately I do not have here but in effect it was this: In our progress through life a great deal of injury is wrought by not showing our appreciation of people while they are with us. Let us give them our flowers now. We do want now to say a few things about the founder of our organization. In my history of this association Dr. Deming was the person who first proposed an association of this kind. I believe this was about 21 or 22 years ago, perhaps longer than that. At any rate the association has been going for some time and it was brought into existence through the thought of Dr. Deming. We should be very glad to hear from Dr. Deming.

DR. DEMING: Thank you. It is very gratifying indeed but I wish you hadn't. It is very difficult to express gratitude properly. I cannot make a speech like our friend Dr. Smith here, who I hope will make one. I can't tell a good story like our President. In fact, I feel like that man who said, "How happy is the moron, he does not give a damn. I wish I were a moron. My God! perhaps I am."

David Fairchild says that it takes the energies, the fortunes and the lives of pioneers, the best people of our country, to build up a new plant industry. I congratulate you all in being included in that class of pioneers, the best people of this country. But we haven't yet built up the great nut industry that we would like to build.

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I might tell you how the idea of the nut growers association arose. In 1907 I got a little farm of forty acres in Connecticut. In 1908 I read an article by Dr. Morris, "Nut Culture as a Side Line for Physicians." I immediately wrote the doctor and he said in fifteen years I could have an income of \$100.00 an acre from nuts alone. That seemed to me exactly what I wanted, \$4,000 a year and live very comfortably. So I bought all the nut trees I could find. I bought nut trees from every nursery in this country that offered them in the North. I got pecans from the South. I sent to California and got filberts and English walnuts. I sent to Europe for English walnut seeds. I bought twenty acres of chestnut sprout land and grafted the sprouts. Just as the chestnuts were beginning to bear the blight came along. That ended them. The English walnuts I set around in fence corners and they grew a little smaller every year and, finally disappeared. That was the end of the English walnuts. At that time I couldn't graft hickories. With great labor I collected hickory scions and sent them to nurseries in the South and had them grafted. They arrived in the North after the ground had frozen. I told the hired man to heel them in. He heeled them in but left the top of the roots out. In the spring they were all dead. By that time my dander was up a little. I thought there must be other men who were having the same trouble. If we could have a little organization we could tell each other our troubles and perhaps work them out together. I wrote Dr. Morris, John Craig, Professor Close, Mr. Hales, and one or two others, and we met together in the Botanical Museum in Bronx Park and organized the Northern Nut Growers Association. That is all I had to do with it. Whether we will ever come to the place where they will have bands out and ticker tape flying, when we come to town—that is the thing I used to dream about a little when we first started. But I don't think we are destined to burst wide the gates of fame yet. We may after we have achieved our objects. As Dr. Fairchild has said, all our money, lives and energies must be devoted to them. We then may achieve post-mortem fame.

I want to say one thing, however, before I stop. We can't advocate the planting of nut trees if there are no nut trees to be had. Therefore, I think the Northern Nut Growers Association should do all that is possible to encourage the nursery men who are propagating nut trees. We should consider the propagating nursery men as a vital and essential part of the work we are trying to do.

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THE PRESIDENT: Dr. Deming made some reference to stories. Once in a while a story does flit across my mental horizon. I want to tell you how the word "nut" may have a very humorous interpretation. Once upon a time in Michigan a man died. After he died the local minister went around to console the widow. When he came of course the lady was grieving. This clergyman was a very young man and he attempted to console her thus: "Now, my dear Mrs. Smith; that which you see is just the husk, the nut has gone to heaven." Another time I addressed the Women's Canadian Club. I was invited to address this group on nut culture and the President in introducing me told a story about a minister too. In this case the minister got up in his pulpit and made an announcement: "My dear friends, my sermon is on liars. I am glad to see so many present." This lady said, "Of course, Mr. Neilson cannot say 'I am going to talk today on nuts, I am glad to see so many present'." I would like to give you an outline of the progress made during the past year. In writing this I had to inject into it a great deal of my own activities. I simply couldn't get out of it. I ask you to overlook the frequent references of a personal nature.

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PRESIDENT'S ADDRESS

This is our twenty-first meeting and the first one to be held in the state of Iowa where tall corn grows, where good nuts thrive and good people live. We are glad to come to the midwest and meet some of its people, and see what our friends the Snyder Brothers and others are doing to extend the culture of nut trees in Iowa and other midwest states.

In looking over the records of the past year we find the usual experiences common to the lot of man. We find loss and gain, sorrow and joy. Our sense of loss and sorrow is heightened when we think of the passing of our good friend and efficient secretary Mr. Henry D. Spencer of Decatur, Ill. His sudden death was a shock to us all and we feel that his passing is a distinct loss not only to our association but to his city and state. It is also a loss to us as individuals in the severance of those helpful friendships which do so much to cheer us on our way and make life worth while.

In association matters, Mr. Spencer was most active and efficient. He was zealous, original and energetic, and did a lot to create interest in nut culture in his state and other midwest areas. Of him, as of others who have labored faithfully for an ideal and passed to their reward, may it be truly said, "The just die in their turn, but falling as the flowers, they leave on earth their fruit that outlives them."

While we have lost a capable secretary and good friend we have been fortunate in securing the services of Dr. A. S. Colby as a successor to Mr. Spencer. The news of Mr. Spencer's passing came just before your president left Lansing to address the Illinois State Horticulture Society on nut culture. In casting about for a new secretary, it occurred to me that Dr. Colby was the logical man for the position. While at Urbana where the Horticultural Society met I broached the matter to Dr. Colby. At first he was unwilling but after some discussion he finally consented to take the position provided the university authorities at Urbana would agree to his taking on new duties. Dr. Blair, head of the Horticultural Department at Urbana, was then approached on the matter and graciously consented to allow Dr. Colby to assume the secretaryship for the balance of the year. Dr. Colby has fulfilled his position in a very capable manner and I am sure the other executives and members are grateful to Dr. Colby and Dr. Blair for their cordial cooperation and help in our time of need.

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As president I am also deeply grateful to our good and faithful friend Dr. W. C. Deming for taking over the duties of secretary while Dr. Colby was in England attending the World's Horticultural Congress in London, and enjoying a well deserved holiday. I trust Dr. Colby has returned to his duties with renewed zeal and increased knowledge and I hope he will be able to share some of that knowledge with those of us who were not fortunate enough to attend that great congress of horticulturists.

At our last meeting our late Secretary, Mr. Spencer, outlined the worthy scheme of staging a nut exhibit at the Chicago Garden and Flower Show, held in the stadium at Chicago. Considerable work was done by Mr. Spencer before he died, and afterward by Dr. Colby when he took over the secretaryship. Your president was able to assist Dr. Colby in various ways, such as staging the exhibit, in helping financially, and in personally attending the exhibit for five days. This exhibit of nuts was made up of entries from Indiana, Illinois, Iowa, Ohio, Michigan, Ontario and British Columbia. It attracted a great deal of attention and I am sure was the means of creating interest and disseminating a lot of useful information on nut culture. We were ably assisted in this project by Mr. J. W. Wilkinson of Rockport, Indiana, and Mr. Frank Frey of the Rock Island Railway, Chicago. Both of these gentlemen contributed valuable exhibits and gave generously of their time during the progress of the exhibition. Our past president, Mr. Snyder, also sent very useful exhibits.

In the carrying out of his duties as Specialist in Nut Culture for the Michigan State College, your President feels that some progress has been made since April, 1929. During that period arrangements have been definitely made, or are about to be made, by that princely public benefactor, Mr. W. K. Kellogg, which will set aside several hundred acres for nut culture. About thirty acres of this area have already been planted to seedlings and grafted walnuts, chestnuts, hickories, heartnuts, hazels, and filberts. These trees have done as well as could be expected under the hot, dry weather of these past two summers. Arrangements are actively under way for planting 55 acres next spring and a much larger area in the following spring. We expect to assemble a first class collection of the best hardy varieties of native and introduced nut trees and hope as the years roll on that definite progress will be made.

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In September 1929, a nut contest was drawn up and announced to the public of Michigan and adjoining states. This contest created a great deal of interest and many entries were received. Cash prizes of \$50.00 each were offered for walnuts and hickories and awards of merit were given for other species. There were 451 plates composed as follows: black walnuts 313, English walnuts 11, butternuts 7, heartnuts 7, Japanese walnuts 13, hybrid walnuts 4, hickories 85, chestnuts 10, hazels 1.

These entries were used in staging what is said to be the largest exhibit of nuts ever displayed in the northern United States. From these numerous entries several selections of value were made. From these selections, six black walnuts, two heartnuts, three hickories and four chestnuts were chosen for propagation. Some of these have been propagated and plans are made to propagate a greater number next year.

The writer spent one week in Ontario during March for the purpose of introducing scionwood and

trees of promising varieties of English walnuts, heartnuts and hybrid walnuts. Thirty trees of the Carpathian strain of the Persian walnut were introduced and all are now alive on our grounds at Lansing. These Carpathian walnuts have endured several winters at Toronto and Montreal and so far have not shown any winter injury. If further trials show that this strain is hardy it will be a decided improvement over any other Persian strain in the northern states or Canada.

Good varieties of heartnuts and filberts were brought in from British Columbia and are now growing nicely at the Kellogg Farm.

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Grafting demonstrations were given at nine different places throughout the state during the month of May. These demonstrations were attended by fair sized audiences and much interest was shown in the operation.

In addition to the address before the Illinois Horticultural Society, your president gave an address on nut culture to the Michigan State Horticultural Society at Grand Rapids in December last, and also had on display a large collection of Michigan nuts. The address on nut culture and the display of nuts created considerable interest. He was also invited to address the Iowa State Horticultural Society on nut culture and the Iowa State Nurserymen's Association on the paraffin treatment of nursery stock, but could not do so because of a previous engagement. Arrangements have been made however to give these addresses at the meeting of the above associations at Shenandoah, Iowa, in November next.

The ancient parable of the sower who went forth to sow and who scattered seed on stony ground, by the wayside and on good soil, had a successful manifestation in the president's experience this last year. In March, 1929, I gave an address on nut culture to a small but influential audience in St. Thomas, Ontario. This meeting was due to the enterprise of Dr. C. C. Lumley, the capable secretary of the Chamber of Commerce in St. Thomas and one of our valued members. At this meeting I displayed a collection of Canadian grown nuts and suggested the use of nut trees for roadside and ornamental planting as well as for other purposes. These suggestions fell on rich soil, figuratively speaking, and bore fruit in an astonishing manner. In a short time an Elgin County Nut Tree Growers' Association was organized and a definite plan of operations outlined. One of the projects consisted in planting the Kings Highway, No. 3 in Elgin county, with walnut trees. With the cooperation of horticultural societies, service clubs, schools, etc., over 7000 nut trees were planted in one day last spring, and besides that more than 4000 other nut trees were planted on the home grounds of the people in this county. The encouraging feature of this project was the statement by Dr. Lumley that your president was the inspiration of all this planting. Without a sympathetic and energetic audience I could not possibly have done much by myself, and I am sure Dr. Lumley and his associates deserve great credit for their vision and energy. May their numbers be multiplied and their shadow never grow less. "And some seed fell on rich soil and brought forth a hundred fold."

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You will very likely be pleased to learn that your president is interested in an advisory capacity in a project having for its object the gift of a good nut tree to every member of the Women's Institute of Ontario. This organization is composed almost entirely of rural women and is one of the most active and helpful societies in the country. The institute gave me hearty support in my efforts to promote the culture of nut trees in Ontario, and on several occasions passed resolutions asking the government to adequately support my work. There are over 40,000 women in this organization and it will take time and money to accomplish the objective, but no worthwhile movement ever progressed without a vision and a plan.

In conclusion I would like to read a beautiful little selection entitled "Save the Trees in Portugal." In reading this I am going to ask you to transpose the title to "Save the Trees in the Mid-West," and to think in terms of nut trees.

SAVE THE TREES IN PORTUGAL

Travellers in Portugal report that in many places where timber trees are to be found, in woods, parks and gardens, one sees the following inscription headed, "To the Wayfarer":

"Ye who pass by and would raise your hand against me, hearken ere you harm me.

"I am the heat of your hearth on the cold winter night, the friendly shade screening you from the summer sun, and my fruits are refreshing draughts, quenching your thirst as you journey on.

"I am the beam that holds your house, the board of your table, the bed on which you lie, and the timber that builds your boat.

"I am the handle of your hoe, the door of your homestead, the wood of your cradle, and the shell of your coffin.

"I am the bread of kindness and the flower of beauty.

"Ye who pass by, listen to my prayer; harm me not."

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A practical application of this beautiful message would add to the beauty and productive capacity of this country and would give pleasure and profit to its people.

Dr. J. Russell Smith was here called upon and gave entertaining and amusing accounts of his early struggles with nut culture and of some of his travels in foreign lands.

THE PRESIDENT: I would just like to add to what I have said that the Rev. Paul Krath of the United Church of Canada is now about to leave for a five year absence in central Europe. He tells me he would like to sell the balance of those hardy Carpathian walnuts. I have faith in them. I think they are worth the price he asks for them for an experimental purpose alone.

DR. SMITH: Do you know where the seed was procured?

THE PRESIDENT: On the high slopes of the Carpathian mountains. The winter temperatures go down rather low. In fact lower than in Toronto.

MR. HERSHEY: Juglan regia?

THE PRESIDENT: Yes. In early September the buds were quite matured, wood was ripened up and favorable for enduring the winter temperatures of Toronto. I have an impression that it gets 15 to 18 below zero. The trees have come through the winter at Montreal where they have even lower temperatures.

MEMBER: How would we get them in? Get a permit from Washington?

THE PRESIDENT: It can be done.

DR. SMITH: An application for the lot can be made.

The President then asked for the report of the Secretary.

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REPORT OF THE SECRETARY

The year 1929-30 has been one of growing interest on the part of the public, laying the foundation for a more rapidly increasing membership and wider influence on the part of the association.

Following the untimely death of Secretary H. D. Spencer, of Decatur, Illinois, we were asked by your president, Professor Neilson, to carry on the work of the office for the remainder of the year, in view of our previous experience. This we were glad to do because of our interest in the work. The great loss of the association in the death of Mr. Spencer should be here recorded. Mr. Spencer was keenly interested in nut growing in the North. He believed in its future and because of his retirement from active professional work could give his attention to the many details connected with the development of our program. His loss is keenly felt among the membership.

Your secretary has attempted to make the public, only more or less awake to the possibilities of our work so far, more nut culture minded. The burden of correspondence has become increasingly heavy. Hundreds of inquiries have been received, many from those mildly curious, but a large share from people anxious to learn of the possibilities of northern nut culture both for pleasure and profit. We have noted an increasing interest among those able to take up our new enterprise and have done what we could to make it an intelligent interest through radio, newspaper, and magazine publicity, speaking engagements at horticultural society and farmers' institute meetings and classroom instruction. The enthusiastic support of officials of these and similar organizations should be noted here. Space has been freely offered for use in fruit growing magazines and state horticultural society publications to supplement the columns of our official organ to spread the information regarding our activities, thus reaching a wider circle of potential members. We are glad to report some membership gains the past season.

In these activities we are handicapped by lack of funds. We have been particularly fortunate these past few months in having the co-operation of the University of Illinois in that your secretary has been able to handle hundreds of letters through the Department of Horticulture channels free of cost to the association except for the stationery and postage.

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One outstanding event of the season in the line of publicity sponsored by the association was the exhibit at the Central States Garden and Flower Show held in the Chicago Stadium April 5-13, 1930. Preliminary arrangements had been made by Mr. Spencer with the manager, Mr. John Servas, insuring us free space. Mr. Servas cooperated with us to the fullest extent and the appreciation of the association was expressed to him by your secretary at the close of the show. We spent considerable time both in the preliminary arrangements and on the ground, being in attendance throughout the week except when President Neilson, Mr. Wilkinson, and Mr. Frey were in charge. To these gentlemen, as well as to Dr. Robert T. Morris, Dr. J. R. Smith, and Mr. S. W. Snyder, who with President Neilson contributed the \$30.00 necessary for rental of the glass show case, and to many of our members in the Middle West who sent samples of nuts, we owe a debt of gratitude. Our exhibit also included books and magazines on nut culture, nut-cracking machinery, grafting tools and waxes, and other material of interest to the prospective grower, all contributed by members or others interested in our work. The exhibit attracted much interest as a part of the magnificent show. We were busy from morning until night answering questions, most of them intelligent, and made many friends among a group of people whose intelligence level is high. Two hundred people asked for further information relative to some particular subject and a mimeographed sheet was prepared in the secretary's office after our return which

went out to them.

We have had the cooperation of the Illinois State Department of Agriculture more than ever this past year, as evidenced by their support of our exhibit at Chicago, through providing funds for the preparation of a case of nut varieties suitable for planting in Illinois and, secondly, through the cooperation of the State Forestry Department. An immense tract of land has been acquired for reforestation in southern Illinois and money was available this past spring for the purchase of nut trees for planting there. Your secretary has been working with R. B. Miller, of the state department, in the selection and planting of the better named varieties of nuts. Additional plantings will be made there and it is believed that a fine beginning has been made toward the establishment of a nut arboretum in that section.

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There are many new things of interest developing in our field and those relating to it which need further study as a means of developing our usefulness.

The plant patent law, new methods of propagation, the variety question, the disease factor, new methods of harvesting, grading and marketing, to mention a few problems, are bringing about a new era in northern nut growing and need our combined efforts in their solution. We believe that the time is fast approaching for the appointment of a paid secretary who can devote more time to the development of our work. We will leave to you the working out of the details.

Dr. Colby supplemented his report with a talk about his trip to Europe during the summer where he went primarily to attend the World Horticultural conference in London. After some further informal discussion the meeting adjourned.

FIELD TRIPS

The second day, September 18, 1930, was given over to a visit to the Snyder Fruit and Nut Orchards at Center Point in the morning, where the group inspected the varieties being grown with great interest, an excellent lunch at noon under the trees, prepared and served by the Snyder brothers and Miss Snyder, their sister, and an afternoon spent in the Snyder nursery where the various nut trees which can be grown in Iowa were observed.

BUSINESS SESSION AT SNYDER FARM

Meeting called to order by President Neilson. A vote of thanks was extended to Miss Snyder and the Snyder brothers for their hospitality. S. W. Snyder responded briefly.

The meeting place for next year was then discussed. Invitations were extended from Rochester, New York, Downingtown, Pennsylvania, Geneva, New York, and other places. It was finally voted to meet in Geneva, New York, in September 1931 during the week of the annual meeting of the New York Fruit Testing Association. The selection of the date was left in the hands of the executive committee.

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The report of the nominating committee was then called for. The association re-elected Professor J. A. Neilson as president, C. F. Walker as vice-president, and Karl Green as treasurer for the ensuing year. Professor A. S. Colby was unable to continue as secretary and that office was held open. The president and board of directors were instructed to appoint a new secretary. ^[A]

The financial status of the association was next discussed at length. It was voted that a letter be prepared and sent to the membership asking for contributions.

The report of the nut survey was then briefly presented by C. F. Walker, chairman of the committee, as a progress report. He stated that 1600 nut trees of various varieties had been recorded and data concerning tree performance and adaptation were being collected.

Frank H. Frey reported that he did not feel it advisable at this time to affiliate with the American Fruit & Vegetable Shippers' Association because of the expense to be incurred.

The secretary extended greetings of Mr. Ellis of Vermont whom he met at the meetings of the International Horticultural Congress in England last summer, and of Mr. Howard Spence of England to the association. It was a pleasure to report that Mr. Spence had been instrumental in having experimental work with nuts initiated in England.

The third day was devoted to a tour of the country round about Burlington where Mr. Snyder and Mr. John Witte showed us many of the most valuable parent trees found in that section. Some of these trees included the Witte and Elmer pecans, the two varieties recommended by Mr. Snyder for planting in that section; the Hill and Iowa shellbark hickories, the two best so far found in Iowa; the Burlington, Tama Queen, and Eureka hickories, the Oberman and Campbell pecans, and the Swartz black walnut.

[A] NOTE: Mr. W. G. Bixby was appointed and accepted the office.

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TREASURER'S REPORT

RECEIPTS

Balance, Sept. 1st, 1929:		
In bank in Washington, D. C.	\$194.41	
Litchfield Savings Society	15.94	
	———	\$210.35
84 paid in advance memberships @ \$3.50	294.00	
9 back memberships @ \$3.00	27.00	
Sub. to American Nut Journal	100.50	
Contributions and sale of Annual Reports	70.92	
Loan, Merchants Bank and Trust Co., Washington, D. C.	325.00	
		———
Total to be accounted for		\$1,027.77

DISBURSEMENTS

American Nut Journal, subscriptions	\$ 101.75
Hotel Pennsylvania, N. Y., rent for projector	30.00
Reporting New York meeting	122.18
Mimeographing	11.45
Stenographer, Secretary's office	42.85
Printing, Secretary's office	51.38
Expenses, Secretary's office	24.78
Printing, Treasurer's office, two years	98.00
Printing Annual Report	428.88
H. D. Spencer, expenses to New York meeting	122.48
Stamps	3.00
Expressage	3.75
Exchange, Canadian check	.15
Curtaiment on loan	50.00
Interest on loan	10.40
	———
Total expenses	\$1,101.05
Deficit	73.28
Balance due on loan	275.00

NOTE—Although the expenses exceeded the receipts, no actual overdraft occurred because certain bills were not paid until funds from the next year came in. However, both overdraft and loan have been taken care of through contributions made during November and December, 1930.

Respectfully submitted,

KARL W. GREENE,

Treasurer.

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HARVESTING AND MARKETING THE NATIVE NUT CROPS OF THE NORTH

By C. A. Reed, Associate Pomologist, U. S. Department of Agriculture

The native nut crops in the northern portion of the country, east of the Rocky Mountains, offer a possible source of considerable income, if gathered while in prime condition and properly prepared for market. Thousands of bushels of highly edible nuts annually go to waste in that portion of the country covered by the great Mississippi Valley, the Appalachian region and the Middle Atlantic seaboard. These are chiefly black walnuts, hickory nuts, and butternuts, although it is probable that several hundred tons of beechnuts which annually go ungathered should be included. These last are too small for human consumption in this country, under the existing relations between human labor and the quality of available food. Nevertheless, there are ways by which they can be put to profitable use.

The kernels of black walnuts and butternuts are in great demand. The potential supply of the former is usually abundant but the small number of butternut trees in the country automatically makes the possible supply of nuts of that kind very limited. The kernels of both these, walnuts and butternuts, and also of the best northern hickories, particularly the shagbarks and shellbarks, are highly palatable and nutritious. In these respects they compare favorably with any other kinds of nuts on the market. These northern species are singularly free from an

impregnation of tannin in the pellicles which leaves a bitter after taste so familiar with certain of their chief competitors in the nut market.

Black walnut kernels in particular appear to be firmly entrenched in the markets of this country. They are in keen demand with many classes of manufacturers. This demand is on the increase with no apparent possibility of foreign competition, as the eastern black walnut, *Juglans nigra*, the finest of the American blacks, is grown nowhere outside of the United States except in certain districts of a narrow adjoining fringe of neighboring Canada.

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The present year may be one of the best likely to occur soon in which to harvest and prepare these nuts for the market or home consumption on the farm. The drought has undoubtedly reduced the crop as a whole, although at this writing the yield appears considerably greater than that of 1929. At harvest time it will probably be found that many of the nuts are below normal size and that the kernels are imperfectly developed. The quantity of the finished product which it would be possible to place on the market would therefore appear likely to be small.

On its face, with a light crop of poor grade in prospect, it may be difficult to understand why this should be a propitious year to inaugurate a systematic harvesting and marketing campaign. However, in explanation of this, *first*, there are no carry-overs from last year. So short was the crop of 1929 that manufacturers found the supply exhausted before the end of last January. Many sent out urgent appeals hoping to find some source of supply. They offered the inviting price of 65 cents a pound for good grade kernels, f. o. b. the farmers' shipping point. Yet it was all in vain as the kernels were not forthcoming.

Second, as a result of the recent extreme drought and the consequent shortage of some of the more staple crops, there will likely be considerable slack time on many farms. Where this is the case and there are nut crops in the field it will likely be found in many cases that they may be gathered and sold to good financial advantage, assuming that right methods are employed in harvesting and preparing for market.

Third, where there are nuts in quantity too limited to justify gathering and preparing for market, they should still be gathered and as carefully prepared as though for the market and used on the home table. They will be found to be most excellent and pleasing food.

To obtain the highest prices for black walnuts or butternuts, certain fundamentals should be kept in mind.

1. They should be sold only in the shelled condition.
2. The kernels must be delivered early.
3. They should present an attractive appearance.
4. They should be in thoroughly sanitary condition.

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The explanation as to why they should be sold in the shelled condition is simple. The weight of shell is too great to justify shipment in that condition. In the shell, walnuts and butternuts seldom bring more than \$1.50 or \$2.00 per bushel and the demand is exceedingly limited, especially after the earliest part of the season. Again, the shells are of no value except for fuel. Fuel of this kind by freight or express is exceedingly costly. Again, the nuts must be cracked somewhere and the kernels removed before they can be used, and farm labor is much cheaper than that of the city. Regardless of where the labor is from, the cost of cracking the nuts and picking out the kernels, or "shelling" as the operation is called in the trade, is charged back to the farmer. The shelling of these nuts is something in which the whole family on the farm can join.

Delivery should be early as it is then that prices are best. The use of shelled nuts is practically an all-year affair, yet, just as soon as the supply begins to bulk up in the hands of the wholesalers, prices promptly go lower.

The condition in which black walnut kernels reach the market is ordinarily very poor. Little attention appears to be paid to the matter of sanitation, and practically no thought is given to their appearance. As a rule, shipment is made in burlap bags of double thickness. Little thought is ever paid to separating the kernels according to shade of color and it is rare that the kernels are properly cured after being removed from the shells. Oil and moisture given off by the kernels are taken up by the burlap bags, and by the time delivery is made to the wholesaler, the kernels are in no sense attractive and are often unsanitary. Fortunately, the kernels are carefully gone over by employees of the wholesaler by whom all spoiled pieces are removed and, in the process of manufacture, the kernels are usually so heated as to dispel any danger from ill effects due to the unsanitary condition.

The successive steps essential to harvesting and preparing for market may be grouped as follows:

1. Harvest the nuts as soon as mature.
2. Remove the hulls promptly.
3. Cure the nuts somewhat.
4. Crack the shells and remove the kernels very soon.
5. In cracking, the kernels should be separated into five grades—Lights, darks, intermediates as to color, small pieces and crumbs.

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6. Before packing for shipment the kernels must be artificially cured until they no longer feel moist to the hand when it is run through the container.
7. Barrels or boxes of wood, or strawboard lined with water-proof paper, should be used in packing for shipment. These should not be closed until immediately before shipment.
8. As soon as received by the buyer the containers should be opened and the kernels spread out in clean bins where they may receive frequent inspection.

Harvesting

The nuts should be picked from the ground within three or four days from the time they fall. If possible the limbs should be jarred so as to shake the nuts from the tree. Good nuts will usually be found to mature within a very few days and may readily be shaken down.

At this time the hulls will be perfectly sound and not objectionable, in so far as staining the hands is concerned. But if the hulls be broken open the juice which they emit will leave a lasting stain on the hands or garments. But the hulls need not be broken to any great extent.

Hulling

The ordinary corn sheller on the farm is undoubtedly the most practicable instrument for removing the hulls, generally available at this time. If the hulls are still green enough to be firm, the nuts may be placed in the machine by hand. Otherwise, some arrangement may be worked out by which the nuts may automatically be fed into the machine. After hulling by this method the nuts should be put into a tub or tank of water and thoroughly washed with a broom or stiff brush. When the nuts are hulled promptly and well washed it will be discovered that the natural color of walnuts is light or whitish and not black. The dark color is wholly due to stain from the green hulls. This stain, by the way, loses its effectiveness as soon as the hulls turn dark. Stains from nut hulls which have lost all trace of green color, so that the hulls are black, are readily washed from the hands.

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After the nuts have come from the sheller they may be handled by shovels or by forks with tines close together. They should then be cured for a few days. For this purpose they should never be placed in piles or deep layers. Preferably they should be spread out in trays with bottoms of wire mesh or narrow cleats so as to be open. These should be put where there will be a free circulation of air all about. Where trays are not available the nuts may be spread on a barn floor and the doors left open during the day. If the weather is bright they may be spread on boards laid on the ground directly in the sun, although it is probable that they should be given partial shade during extremely hot days.

Various methods of hulling other than by the corn sheller are in use. Some involve merely stepping on the nuts with a forward movement of the foot, just as the hulls are softening. This is not particularly satisfactory as the nuts must still be picked out of the mashed hulls by hand. Besides leaving a very persistent stain on the hands this method is unsatisfactory for two reasons; it is not at all rapid and very far from perfect in the degree to which it removes the hulls.

Other methods involve the use of automobile wheels. Sometimes machines are driven over the nuts as they are thinly spread on the ground. Again a wheel is jacked up and set in motion in a tub of water in which the nuts have been placed. Both methods have their advocates. The writer has had experience with the former only, yet he can conceive of little to commend either method.

Still another method is that of pounding off the hulls by hand. Of all common methods this has the fewest conceivable advantages. It is slow, thoroughly inefficient, and extremely objectionable from the standpoint of the stain.

What is perhaps far the most satisfactory method of any yet used for removing the hulls, from every standpoint except that of expense, is one evolved by the Department of Agriculture in 1926. It consists merely of running the nuts through large-sized vegetable paring machines. These machines consist of metal containers, circular in form and having a capacity of approximately 1-1/2 bushels. The inner walls are lined with hard abrasive surfaces. A bushel of nuts is placed inside, the lid closed, a stream of water turned into the container, and the machine set in operation. By means of gears attached to the bottom of the container which is separate from the walls, plated and perforated, the bottom spins around several hundred times per minute. The nuts are made to beat violently against the rough walls with the result that, in from 2-1/2 to 5 minutes, depending upon the firmness of the hulls, the nuts are ready to be taken out. They are then perfectly hulled, thoroughly washed and light or whitish in color.

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With a few days of drying, the nuts should be ready for cracking.

Cracking

As soon as fit for cracking, and before becoming so dry that the kernels break badly, the nuts should be shelled. The hammer and a solid block of wood, or a piece of metal with a shallow cupped depression in which to place the nuts while held for hitting, is the most common outfit in use. Various handpower machines are appearing on the market, and already designers are at work attempting to devise power machines. The former have been in use for several years. The

latter are mostly quite new and untried. About all that can be said regarding such machines is that they are much needed and that it is not improbable that there will soon be several makes of efficient machines in the field.

Grading the Kernels

As soon as the shells have been cracked, the kernels should be extracted. All large pieces, including chiefly quarters and whatever halves there are, should be separated into three shades: lights, darks and intermediates, as previously mentioned. All sound, small pieces, regardless of shade, should be put into a fourth grade and all unsound kernels and particles too small to separate from minute particles of shell, should be put into a fifth grade and fed to poultry in moderate quantity at one time.

Unless given artificial heat before packing for shipment, the kernels are fairly certain to become moldy and even to cake together in a solid mass while in transit. To do this they should be placed in trays or pans and put above or back of a kitchen stove where they will not get hot enough to be injured. The hand should be run through the kernels not infrequently so as to detect any excessive heat and also to determine by experience the proper degree of dryness.

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After being kept warm and being frequently stirred until the kernels seem properly dry they may be removed and allowed to become cool. They should then be re-examined with the hand so as to determine the apparent dryness. If they feel at all moist, they should be returned to the drying position and the operation repeated. The writer has had no personal experience in this matter and so cannot give precise directions. However, the farm wife can probably work out a very satisfactory system in her kitchen.

Packing and Shipping

Although previously discussed, the importance of clean, sanitary and attractive containers for shipment can scarcely be overstressed. Without such precaution no one need hope to work up a permanent business, for, regardless of how secure he may feel with the trade he will eventually find his customers turning to others who are willing to go to this trouble.

When the time comes for shipping the boxes may be closed up and delivered promptly to the transporting agency. The containers should again be opened as soon as the destination is reached and an examination made as to the moisture condition of the kernels.

Handling Other Nuts

So far as harvesting and hulling hickory nuts is concerned, the matter is not at all complicated. Good nuts drop with the first sharp frost. Those with good kernels inside become automatically separated from the hulls. Those which do not easily become separated from the hulls should be discarded as they are rarely of any value and should not become mixed with the good nuts. With a moderate amount of curing these nuts should be ready for market. They usually bring better prices in the shell than do walnuts; but on the other hand they are in less demand after being shelled. Perhaps this is because the trade has not been built up but it is a recognized fact that black walnut kernels are practically in a class by themselves among the nuts of the world, in the extent to which they retain an agreeable flavor in cooking. Hickory nut kernels should be given a much greater place than they now occupy in the cooking and baking for the farm table. A few finely chopped kernels mixed with breads, cakes, or cereals will be found highly acceptable to most palates.

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Butternuts are generally too scarce to justify much attention. They could probably be hulled by vegetable paring machines quite as efficiently as are walnuts but, so far as known to the writer, this has not been tried.

Beechnuts make excellent food for poultry and certain kinds of livestock. To convert the crop into cash is largely a matter of using the land under the trees for the right sort of grazing. In European countries beechnuts are highly valued as a source of salad oil. Mr. Bixby of this association is taking steps to procure trees bearing as large sized nuts as possible with a view to subsequent breeding. So far as known to the writer beechnuts in this country are not gathered in quantity.

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BEECHNUTS

By Willard G. Bixby, Baldwin, N. Y.

Although the association has now been in existence 20 years there has so far been little progress, we might almost say no progress, made in getting an improved beechnut.

All have agreed that the flavor of the beechnut was excellent, that it had a shell so thin that it could be opened with a pocket knife, that it was an oily nut and would keep, like the thin shelled hickories, walnuts, etc., and not a starchy one, which would dry out like chestnuts and acorns,

that it would grow and bear well in northern sections where the best nuts we have do not grow well, but also that it was so small as to practically nullify the above mentioned excellent qualities. If we ever get a beechnut the size of a chestnut we shall have a most needed addition to our nut bearing trees, but there has been so little hope of finding such that no one has paid much attention to the beech. As a matter of fact not within the last ten years have there been any prizes offered for beechnuts except those provided by the writer at his own expense, neither have there been at any time during the writer's recollection any varieties suggested excepting one or two by Omer R. Abraham, Martinsville, Ind., which nobody has growing, so far as known to the writer.

It was thought that there might be a large fruited species of beech growing in some part of the world as is the case with the chestnut, walnut, hickory and hazel, and that it would only be necessary to import it to get what was needed, or at least to make a good start in getting what was needed. Rehder in his wonderfully helpful "Manual of Cultivated Trees and Shrubs" gives seven species of beech, one in America, *Fagus grandiflora*, one in Europe, *F. sylvatica*, two in Japan, *F. sieboldii* and *F. japonica*, two in China, *F. longipetiolata* and *F. engleriana* and one in Asia Minor, *F. orientalis*. These are growing in the Arnold Arboretum and leaves, buds and fruits are to be seen in the herbarium there. A day spent there, however, half in the arboretum and half in the herbarium, convinced the writer that there is at present no large fruited species of beech known to botanists. There is an incompletely known species of Chinese beech, *F. lucida*, whose fruit is not in the Arnold Arboretum. While it is of course possible that there may yet be a large fruited species somewhere in the world, still the relatively slight differences in the leaf, bud and fruit of the seven species already known makes this seem improbable and leads us to conclude that the genus "Fagus" is the most uniform in the species that make it up of any genus of nut bearing trees. This seemingly reduces us to the necessity of seeking variation in species already known.

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Fagus sylvatica has been by all odds longest in cultivation and many varieties are known. Rehder lists 17 principal varieties with many other sub varieties. These have leaves varying in color, purple, copper color, pinkish, yellow and whitish spotted with green, beside the usual green, also in shapes of leaves, some very narrow almost linear, some very small and deeply toothed, others large and roundish up to 3 in. broad and 5 in. long. The varieties vary in bark from the smooth bark typical of the beech to bark like that of the oak. They also vary in habit of growth, being mostly erect but some pendulous and some dwarf with twisted contorted branches. But no one seems to have ever heard of a large fruited beech.

It is inconceivable however, that a tree can vary in every particular except in the fruit and it is believed that it only requires sufficient searching to find large fruited varieties. There are difficulties, however, in the way of finding unusual beeches which do not occur with walnuts, chestnuts and hickories, which are trees where the nuts have such merit that they are usually spared even if in the middle of a cultivated field, while the beech is usually a forest tree. A nut contest brings hundreds and thousands of walnuts and hickories but only very few beechnuts. Correspondence with the forestry departments of every state having such departments generally evinced interest in the search for a large fruited beech, but those replying universally disclaimed any knowledge of such.

While it is believed that there are such in America, perhaps as many or more than in Europe, and efforts should be made here to find such, there are many reasons for believing that a search in Europe will be more immediately productive of results than will the search here. The beech is much more esteemed in Europe than here and has been extensively planted in forests that for centuries have been operated for constant production of timber. It is believed that the contents of those forests are as a class better known to their keepers, at least the beeches there are better known than in the forests in the United States. The number of propagated ornamental varieties noted in the second paragraph gives evidence of this. The history of one or two of these varieties will make this clearer.

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Three beeches with red or copper colored leaves as far back as 1680 were recorded as growing in a wood near Zurich, Switzerland. Most of the purple beeches now growing are believed to have been derived from a single tree discovered in the last century in a forest in Thuringia in Germany. There may be or may have been many such in America but they would not have appeared valuable to the woodmen who probably would be the only ones who would see them and then the leaves would not have been visible in the winter when trees are most frequently cut. That the Deming purple black walnut is in existence is due solely to the observation and action of Dr. Deming who gathered scions and got them growing before the original tree had been cut for the purpose of getting space for improving a road. That this tree could be seen from the road was how it came to the attention of Dr. Deming. Had it been in the midst of a large forest it might have been cut in winter for timber without the cutter knowing it was unusual.

That we have such a wealth of varieties of the beech valuable as ornamental trees and none valuable for the large nuts they bear, certainly suggests that the tree varies in every way except in the size of the nuts it bears, but this is not believed to be so. The growing of ornamental trees is an old industry. There are hundreds of nurserymen today growing ornamentals and only few in comparison growing nut trees. It is not so many years ago that there were none growing nut trees. A beech with purple leaves appeared valuable 100 years ago and was disseminated by nurserymen while one with nuts 10 times normal size would probably not have been propagated for there would not have been sale for it. It would have only been known locally as unusual and probably the tree would have been cut for timber when it reached the proper size.

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The search for a large fruited beech is not going to be easy but it is believed that persistent work will eventually triumph, much as the 1929 contest brought more shellbark hickories of value to the attention of the association than all previous contests put together. The shellbark is a tree the best varieties of which it is difficult to learn about. Unlike the shagbark hickory it is not generally found growing near buildings or in fields or pastures. Its natural habitat is the bottom lands of the Mississippi River and its tributaries, lands that are overflowed part of the year. There will have to be a campaign, perhaps for several years, till people begin to look for large fruited beeches; then will come a harvest of them.

The relatively few beeches that have come in to the contests suggests that methods used heretofore should be somewhat modified in beechnut search. Probably a campaign of education among foresters might be more productive of results than among farmers, at least it should supplement it. The search for improved beechnuts evidently has more different kinds of difficulties than the search for any other nut and considerable thought on the matter leads me to suggest that a committee be appointed to study the nut and to seek large fruited specimens especially to look into methods for getting them and report to the association a year hence, said committee to finance itself.

This suggestion is made because it is believed that efforts made in Europe to find a large fruited beech will be more immediately productive of results than in America for the reasons noted above. Even if the committee consists of but one man correspondence abroad would be better carried on in the name of a committee of the association than in the name of an individual and it is believed would be more productive of results.

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THE 1929 CONTEST

By Willard G. Bixby, Baldwin, New York

This has at last been finished. It is a memorable achievement in many ways. It has taken much longer to award the prizes than at any previous contest, which is a matter of deep regret to me. But, if we except the shagbark hickories and the beechnuts, the value of the nuts is so far ahead of those received in any other contest as to make the results of all previous contests commonplace in comparison.

The highest award for black walnuts in the 1926 contest was for the Stambaugh 63 points, which recalculated using the present constants would be 62 points, while all the 10 prize winners in the 1929 contest were awarded more points than 62, the nut taking the tenth prize being awarded two points more or 64 and the nut taking first prize being awarded 19 points more or 81, the difference being largely in generally superior cracking quality of the 1929 nuts.

The highest awards for butternuts, in print and readily referred to, are in the 1919 report where the butternut taking first prize was awarded 67 points, which after recalculation with present constants would be 65 points, and there were nine prizes awarded this year where the score was higher than 65.

The shagbark hickories were disappointing, none equalling several of the best ones reported in the 1919 contest. This is laid to the general poor quality of the shagbark hickory nuts in 1929. One observing contestant sent in nuts from the 1928 crop, as well as nuts of the 1929 crop, to show us how much better they were normally than were those of the 1929 crop, and as a matter of fact the 1928 nuts sent in by him tested out several points higher than those of the 1929 crop. On the other hand, other hickories, *Carya laciniosa* and *Carya ovalis*, which never before were awarded prizes in a nut contest, this year came up into the winning class and we had some large laciniolas of real merit this year, a matter which is likely to be of great importance, as it is noted in considerable detail later on.

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The chestnuts were few in number, yet some very good nuts were received, and as most were from trees which had been growing in sections where the blight has been present for many years, it is believed that they will be of value in getting a blight resistant chestnut of horticultural merit. This work now is really under way.

The beechnuts received were but 4 in number and were pretty good although too small to be of horticultural value. Considerable is noted later on the likelihood of getting larger beechnuts and a way is suggested to get them.

Under the headings black walnuts, hickories, chestnuts, butternuts and beechnuts will be found an abstract of the awards of prizes awarded each. It is believed that this will be all that there will be time to present to the convention. The results of each test in detail will be typed out for printing in the report for it is believed these are of permanent value. Results of tests on many of the well known nut varieties will also be given. Some of these appeared in the 1919 report but owing to the change in the constants necessitated by the discovery of new and better nuts these figures are somewhat out of date. Some of these also appeared in the 1927 report but there are serious typographical errors there and it is believed that it will be of value to have results of the tests on nuts of the 1929 contest appear in the 1930 report, in connection with tests on well known varieties.

The prizes to be awarded are as follows:

Black Walnuts—10 Prizes—Amount	\$100.00
Hickories—25 Prizes—Amount	\$120.00
Butternuts—12 Prizes—Amount	\$106.00
Chestnuts—11 Prizes—Amount	\$103.00
Beechnuts—4 Prizes—Amount	\$ 21.00

Total	\$451.00

That there are more than ten prizes, when there were prizes offered but for ten, is due to our custom, when two or more nuts receive the same score and win a prize, to provide an additional prize of equal amount for each one.

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There have yet to be awarded prizes for those chestnuts of the 1929 contest which show high resistance after being inoculated with blight spores. This cannot be done for two years at least for scions must be gotten growing and have reached a diameter of 3/8" to 1/2" before this can be properly done.

The writer intended, when the contest reached the stage just now reached to endeavor to get a meeting of those members best qualified to pass on characteristic "quality and flavor of kernel" of those nuts put down by him as prize winners. This is the only characteristic where personal opinion has not been replaced by the precise methods, but time did not permit.

The delay in completing the 1929 contest has been very unsatisfactory. It has been caused by a combination of circumstances which it is not believed will occur again. Instead of a contest limited to one nut, as the 1926 contest was, we had here, as well, butternuts and hickories in large numbers, the hickories in particular being more numerous than the black walnuts, and the nuts came in very late, all of which largely increased the nuts to be gone over and delayed Dr. Deming in the preliminary examination. The nuts did not reach me till the last of April, a time when spring work outside was pressing. It takes a person of some experience before even the weighing methods in force for measuring quantitatively nut characteristics can be properly done and while some work was done on the contest practically every day from April 24th on, only about an hour a day could be put on it, and it went so slowly that after about a month, I set about hiring someone who should devote his or her time to it. It took about six weeks before someone was obtained and properly trained, which brought us into July, since which time the work went on well but the number of nuts was large and I had to personally pass on the final award, which must be carefully done and necessarily a good deal of time was taken, far more than anticipated.

The experience of this year's contest has shown me how to better handle another if it falls to my lot to do so. I would get Dr. Deming to send in the nuts, which after the preliminary examination, he thought worthy of carefully testing, instead of waiting till the preliminary examination of all received had been completed. This would get them here in the winter when work is light for the man I have here, who is thoroughly trained for making these tests. Those rejected at first by Dr. Deming he could go over again later, as is his custom, and possibly pick out some good ones which did not show up well when first received.

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BLACK WALNUTS

The black walnuts sent into the 1926 contest were the best that had been seen up to that time, yet those received in the 1929 contest are so far ahead of those as to make us wonder if we shall again find a contest where the black walnuts received equal those received in 1929.

Most remarkable was the case of Mrs. E. W. Freel of Pleasantville, Iowa, who sent in black walnuts from four different trees, each one of which took a prize, No. 1 the first, No. 2 the second, No. 3 the eighth, and No. 4 the tenth, the first time in the history of the nut contests that anything approaching this record has occurred. This is also the first contest where a nut of any other black walnut species than *Juglans nigra* has come anywhere near the prize winners.

The score card used in the 1929 contest was the same as that used in the 1926 contest but with the constants recalculated as required because of nuts received in the meantime which made this necessary.

The prizes awarded are noted below:

Name and Address	Species	Score	Prize	Amount
Mrs. E. W. Freel, Pleasantville, Ia., Nut. No. 1	nigra	81	1	\$ 50.00
Mrs. E. W. Freel, Pleasantville, Ia., Nut. No. 2	nigra	74	2	15.00
Mrs. J. A. Stillman, Mackeys, N. C.	nigra	73	3	10.00
Annie M. Wetzal, New Berlin, Pa.	nigra	72	4	5.00
John Rohwer, Grundy Center, Ia., The Iowa	nigra	71	5	5.00

Mrs. Irwin Haag, New Castle, Ind.	nigra	70	6	3.00
Dane Learn, % Harley Learn, Aylmer, Ont., R. R. No. 6	nigra	69	7	3.00
Mrs. E. W. Freel, Pleasantville, Ia., Nut No. 3	nigra	68	8	3.00
A. F. Weltner, Point Marion, Pa., R. F. D. 1	nigra	67	9	3.00
Mrs. E. W. Freel, Pleasantville, Ia., Nut No. 4	nigra	64	10	3.00

				\$100.00

There are some 32 other black walnuts worthy of honorable mention which were awarded from 55 points to 63 and which it is believed are worthy of experimental propagation. One of these is from A. E. Grobe, Chico, Cal., species, hindsii, total award 61 points, which is the only California black walnut of value sent in to the contests up to this time.

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Nut notable for size were received from:

Mrs. R. F. Frye, Carthage, N. C., R. No. 1, Box 22, Wt, 38.0g, nigra, score 57.

C. T. Baker, Grandview, Ind., Wt. 31.8g, nigra, score 57.

A. P. Stockman, Lecompte, La., Wt. 36.7g, nigra, score 56.

Nuts notable for cracking quality were received from:

Mrs. E. W. Freel, Pleasantville, Ia., CQC 100%, CQA 67.3%, total 38 points, nigra, 81 points total.

Mrs. J. A. Stillman, Mackeys, N. C., CQC 100%, CQA 65.3%, total 38 points, nigra, 81 points total.

J. U. Gellatly, Gellatly, B. C., Cold Stream No. 14, CQC 100%, CQA 40.0%, total 33 points, nigra, 55 points total.

Annie W. Wetzell, New Berlin, Pa., CQC 100%, CQA 37.8%, total 32 points, nigra, 72 points total.

A. F. Weltner, Point Marion, Pa., R. F. No. 1, CQC 100%, CQA 38.0%, total 32 points, nigra, 67 points total.

Mrs. A. Sim, Rodney, Ont., CQC 100%, CQA 39.3%, total 32 points, nigra, 55 points total.

Nut notable for high percentage of kernel:

Ferdinand Huber, Cochrane, Wis., 32.8% 12 points, species nigra, total award 49 points.

Mrs. E. W. Freel, Pleasantville, Ia., Nut. No. 1, 31.6% 11 points, species nigra, total award 81 points.

Attractive color of kernel:

While a number were awarded four points out of a possible 5, none of the black walnuts sent in were especially notable in this respect.

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HICKORIES

This is the first lot of hickories that has come in for a contest conducted by the Association in a number of years. The last contest, that of 1926, was for black walnuts only. It is true that at the meeting of the judges who passed on the black walnuts entered in the 1926 contest there were a number of fine hickories shown which had been received in the contest conducted by the Philadelphia Society for the Promotion of Agriculture, but so far as the writer is aware we have to go back to 1919 to reach the last contest at which prizes were awarded for hickories.

The 1926 contest marked a notable change in the method of awarding prizes. As noted at some length under black walnuts, that score card was made simpler, by the judges who passed on the nuts received in the 1926 contest, by awarding points previously given for characteristics that seemed of less importance to others, so the hickory score card was carefully gone over to see if a similar change could not be made to advantage.

As it is believed that hickory nuts will be sold in the shell, as are pecans, it was not possible to do this to the same extent as with black walnuts. However, the characteristic "form," which is difficult if not almost impossible to estimate with any kind of precision, it was thought for the present at least might be disregarded. Husking quality is important but it was impossible to properly award points for this characteristic in a nut contest, because the nuts are husked before being sent in. The points allowed for excellence in these qualities were added to others, which gave 10 points to Cracking Quality Absolute instead of 5, and 25 points to Quality and Flavor of Kernel instead of 20.

It has been generally considered that a nut which is awarded 55 points, even though it took no

prize, was worthy of experimental propagation. There were 40 hickories in the 1929 contest which were awarded 55 points or more. Of those actually awarded prizes for a combination of good qualities, twenty-one in number, thirteen were thought to be shagbarks, or it might be more exact to state that we had not sufficient evidence to think them to be otherwise, although some are suspected not to be pure *Carya ovata*, four were thought to be *Carya Dunbarii* (*Carya ovata* x *laciniosa*), two were thought to be *Carya ovalis*, and two *Carya laciniosa*. In this contest the shagbarks showed up poorly, 68 being the highest score awarded, when from the number of entries one would have expected the highest to have been awarded 71 points or over. On the other hand this is the first contest where a prize has been awarded to a shellbark, *Carya laciniosa*. Among hickories awarded 54 points or over were five shellbarks, two of them large ones, one weighing 24.3g, 20 per lb. and one weighing 27.6g, 17 per lb.

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The importance of this will be realized when we consider that, in the 1929 contest, out of 21 prize winning nuts four prizes were awarded to nuts believed to be *Carya Dunbarii* (*Carya ovata* x *laciniosa*) and there were two or three others that may prove to be. While natural hickory hybrids are not particularly rare yet they are far from common. At one time, while on the levees north of Burlington, Iowa, the number of pecan x shellbark hybrids seen impressed the writer, yet a careful count showed these hybrids to be only about 1 hybrid in 100 pure pecans. Considerable experience in making or attempting to make hickory hybrids leads the writer to believe that the proportion of hickory hybrids will be much less than this. If, however, we assume it to be 1 in 100 and the fact that among this years meritorious nuts hybrids are 4 out of 21 or 1 out of 5, we would calculate that the chances of getting meritorious nuts out of hybrids is about 20 times as great as out of pure species. We really have not sufficient data at present to attempt to make such calculations yet the glimpse they give us of the promise of wonderful results from the systematic production of hybrid varieties between selected parents is most alluring.

The number of prizes awarded to *Carya Dunbarii* (*Carya ovata* x *laciniosa*) shows a line of work of particular promise. We have plenty of good shagbarks, *Carya ovata*, and now that we have really good shellbarks, *Carya laciniosa*, of large size, fair cracking quality and good flavor which we never had before, we have selected material for the production of shagbark x shellbark hybrids, a class which has produced the Weiker hickory, four of the 1929 contest prize hickories and some other hickories of merit which have come to the attention of the writer during the past two or three years. As we have a number of good northern pecans we have also selected material for the production of pecan x shellbark hybrids, a class which has produced the McAllister pecan. If the 1929 contest does nothing more than to bring to light these fine shellbarks it is worth all its cost.

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The contest also has shown some mockernuts of large size and better quality than ordinary but still not good enough to be in a class with the shellbarks noted above. The number of years that we have been testing hickories without getting good shellbarks leads us to hope that we will eventually get good mockernuts.

The prize winning hickories are noted below:

Name and Address	Species	Points	Prize	Amount
Mrs. C. Lake, New Haven, Ind.	ovata	68	1	\$25.00
Ferdinand Huber, Cochrane, Wis.	ovata	67	2	15.00
John D. Bontrager, Middlebury, Ind.	ovata	65	3	10.00
John Roddy, Napoleon, Ohio	Dunbarii ?	64	4	5.00
Steve Green, Battle Creek, Mich.	ovalis ?	63	5	5.00
[A]Mrs. Hamill Goheen, Pennsylvania Furnace, Pa.	Dunbarii ?	62	6	3.00
Menno Zurcher Nut No. 1, Apple Creek, Ohio	ovata	62	6	3.00
Edgar Fluhr, Kiel, Wis.	ovata	61	7	3.00
[A]Elmer T. Sande, Story City, Ia.	Dunbarii ?	61	7	3.00
N. E. Comings, Amherst, Mass.	ovata	60	8	3.00
Edward Renggenberg, Madison, Wis.	ovata	60	8	3.00
C. D. Wright, Nut No. 1, Sumner, Mo.	laciniosa	60	8	3.00
Mrs. John Brooks, Ottumwa, Ia.	ovata	59	9	3.00
Arlie W. Froman, Bacon, Ind.	ovata	59	9	3.00
[A]Mrs. C. E. Hagen, GuttenBerg, Clay Co., Ia.	Dunbarii ?	59	9	3.00
L. S. Huff, White Pigeon, Mich.	ovalis ?	59	9	3.00
J. K. Seaver, Harvard, Ill.	ovata	59	9	3.00
Joseph Sobelewski, Norwich, Conn.	ovata	59	9	3.00
Caleb Sprunger, Berne, Ind.	laciniosa	59	9	3.00
Grace Peschke, Ripon, Wis.	ovata	58	10	3.00
John Muriel Thomas, Henryville, Ind.	ovata	58	10	3.00

[A] Means that these varieties were known to the Association before the 1929 contest.

There are nearly as many others which came within two or three points of being prize winners and which it is believed should be propagated experimentally. These will be noted on the complete report. There are also the following which are notable for unusual excellence in one characteristic and which it is believed should be propagated experimentally and are here given honorable mention.

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George S. Homan, Easton, Mo., laciniosa large, Wt. 24.3g, 56 H. M.	3.00
Mrs. E. W. Freel, Pleasantville, Ia., Shellbark, No. 1, laciniosa large, Wt. 27.6g, 54 H. M.	3.00
W. P. Ritchey, Marietta, Tex., alba large, Wt. 25.7g, 44 H. M.	3.00
J. Droska, Pierce City, Mo., alba large, Wt. 23.7g, 39 H. M.	3.00
	—
	\$120.00

BUTTERNUTS

The last contest where prizes were offered for butternuts was that of 1919 and no nuts of value were entered. The 1929 contest has a number of unusually good ones.

The score card for butternuts was revised for this contest on the basis of the one adopted for the black walnut in the 1926 contest and the constants recalculated.

The prizes awarded are noted below:

L. K. Irvine, Menominee, Wis.	cinerea	83	1	\$ 50.00
H. J. Thill, Bloomer, Wis., Box 109	cinerea	78	2	15.00
C. F. Hostetter, Bird-In-Hand, Pa.	cinerea	75	3	10.00
John F. Kenworthy, Rockton, Wis.	cinerea	74	4	5.00
F. E. Devan, Rock Creek, Ohio	cinerea	73	5	5.00
E. J. Lingle, Pittsfield, Pa.	cinerea	70	6	3.00
John Hergert, St. Peter, Minn., Nut No. 1	cinerea	69	7	3.00
Evert E. Van Der Poppen, Hamilton, Mich.	cinerea	66	8	3.00
Mrs. A. B. Simonson, Mondove, Wis.	cinerea	66	8	3.00
Mrs. E. Sherman, Montague City, Mass.	cinerea	64	9	3.00
W. A. Creitz, Cambridge City, Ind.	Bixby?	64	9	3.00
Mrs. Abbie C. Bliss, Bradford, Vt. Nut No. 1	cinerea	61	10	3.00

At first it might be thought that but one species of nuts would be sent in as butternuts, and this was true up to 15 or 20 years ago. The chance hybrids of the Japan walnut and the butternut, named *Juglans Bixbyi* by Prof. C. S. Sargent of the Arnold Arboretum, resemble the butternut so much that as time grows on it is increasingly probable that these will be sent in as butternuts. One came in to the 1919 contest and it is thought that the Creitz of this contest may possibly be such.

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CHESTNUTS

The chestnuts received were relatively few in number but most of them were from sections where the blight had been present many years. Those that were from sections where this condition did not prevail were not allowed to enter. There were a few American chestnuts, some very good ones, from sections where the blight had not destroyed the native chestnut but these were not entered. As it happened all entered were of Japanese or Chinese species, which was somewhat of a disappointment to those who hope that a blight resistant American chestnut will yet be found. It certainly looks so far as if varieties of chestnuts for the blight area, of horticultural value, would be Japanese, *Castanea crenata*, or Chinese, *Castanea mollissima*.

The chestnuts were judged early and scions sent for in order to get a start on the second part of the chestnut problem, that of testing the resistance of these seemingly resistant varieties to the chestnut blight. The scions received were disappointing in quality and disappointing in the extent to which they were gotten started this year. The writer set scions on Chinese (*mollissima*) stock, Mr. Hershey set them on American (*dentata*) stock and the U. S. Dept. of Agriculture set them on Japanese (*crenata*) stock, but owing to the poor scions only part of them are growing. The writer got eight varieties out of twelve to start but it is questionable how they will do, for *mollissima* stock is thought to be good only for *mollissima* varieties and the varieties were all *crenata*, and so, while a start has been made on the problem of getting blight resistant chestnuts of horticultural value it is only a start and much work remains to be done.

The prizes awarded were as follows:

Name and Address	Species	Points	Prize	Amount
Frank B. Austin, Milford, Del.	crenata	70	1	\$50.00
C. Warren Swayne, West Grove, Pa.	crenata	66	2	15.00
Charles V. Stein, Manheim, Pa., R. F. D. No. 1, Nut No. 1	crenata	61	3	10.00
Dr. W. C. Deming, Hartford, Conn.	Mollissima	61	[A]	---
Charles V. Stein, Manheim, Pa., R. F. D. No. 1, Nut No. 2	crenata	59	4	5.00
Helen W. Smith, Linden Lodge, Stamford, Conn.	crenata	54	5	5.00
May Cline, Route 2, Belvidere Rd., Phillipsburg, N. J., Nut No. 2	crenata	53	6	3.00
May Cline, Route 2, Belvidere Rd., Phillipsburg, N. J., Nut No. 1	crenata	51	7	3.00
Howard A. Folk, Brielle, N. J.	crenata	51	7	3.00
W. Russell Parker, Box No. 2, Little Silver, N. J.	crenata	47	8	3.00
Ralph P. Atkinson, Setauket, N. Y.	crenata	46	9	3.00
Victor Page, Elmsford, N. Y.	crenata	41	10	3.00
Frank Atler, Edison, Pa.	crenata	40	11	3.00

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[A] Not entered in contest.

BEECHNUTS

Never before, so far as the writer is aware, has there been a score card proposed for beechnuts, but the need of one is apparent and the following is suggested till a better one is found. It is not doubted that one will appear, for our present score cards for hickories, walnuts, etc., are the result of changes made as nuts received in the contests have shown such to be advisable, and work on the beechnut is 10 years or so behind that on other nuts.

Size is the most important characteristic in the beechnut, for all are thin shelled and practically all are well flavored. If we had a beechnut the size of a chestnut we should have a most valuable addition to our nuts. The points awarded for size have therefore been on the basis that eventually we would get a beechnut the size of a chestnut, although we are very far from that now. Forty points are allowed for size and it is figured that eventually we will get a beechnut 4 grams in weight which is the weight of a medium size chestnut. The constants used in figuring the number to be awarded for other characteristics require little comment for they are figured on the basis of existing nuts as constants have hitherto been calculated. The suggested score card is as follows:

Weight	40 points
Color of shell	5 points
Percent of kernel	15 points
Ease of removing pellicle	15 points
Quality and flavor of kernel	25 points
Total	100 points

The details and methods used in judging beechnuts this year, also the calculations of the constants and the details of the awards, will be typed for the report. [Pg 115]

The prizes awarded were as follows:

Mrs. John M. Pepaw, Johnson, Vt.	grandiflora	40	1	\$10.00
Mrs. George Marshey, Johnson Vt.	grandiflora	39	2	5.00
James Radle, Harbor Springs, Mich.	grandiflora	38	3	3.00
Anthony Andreson, Burke, N. Y.	grandiflora	35	4	3.00
Fagus sylvatica	sylvatica	44	[A]	---
Fagus sylvatica purpurea	sylvatica	41	[A]	---

				\$21.00

[A] Not entered in the contest

It is not believed that nuts of Fagus sylvatica (European beech) will test out better, generally, than nuts of Fagus grandiflora (American beech) but the beechnuts were not tested till late, and the European beechnuts had been kept in a refrigerator, while the American beechnuts had not, which very likely may have been the cause for better retaining both the flavor and pellicle-

removing quality, which made these nuts receive more points for these characteristics and so be awarded more points than the first four.

The meager results in getting beechnuts large enough to be of horticultural value in this contest, as well as in previous contests, and the failures of considerable effort on the part of the writer independently to locate large beechnuts, have caused him to put much thought on the matter and to have come to the conclusion that the search should be conducted in Europe as well as here, for the following reasons:

The beech in Europe is much more esteemed as a valuable tree than here, largely because of its value for fuel.

It has for many years, if not for centuries, been a tree that has been largely planted in those forests, state and private, which have been managed on the basis of sustained production, and it is not doubted that the men in charge are more familiar with the beech trees in the forests under their jurisdiction than is the case in America.

The European beech has shown the most amazing variation in color, size and shape of leaves, color of bark, and habits of growth, which have been perpetuated by grafting as ornamental varieties, and it seems likely that there are equal variations in the nuts which only remain to be discovered.

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In short, while there may be no more large fruited beeches in Europe than here, it is believed that the chances of finding them are better.

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ATTENDANCE RECORD

James A. Neilson, East Lansing, Michigan.
C. F. Walker, Cleveland Heights, Ohio.
Mr. and Mrs. John W. Hershey, Downingtown, Pennsylvania.
Mr. and Mrs. Harry R. Weber, Cincinnati, Ohio.
Dr. and Mrs. G. A. Zimmerman, Harrisburg, Pennsylvania.
Mr. and Mrs. M. A. Yant, Cedar Rapids, Iowa.
Mr. and Mrs. Newton H. Russell, Hadley Center, Massachusetts.
Mr. and Mrs. E. W. Freel, Pleasantville, Iowa.
Mr. and Mrs. W. L. Crissman, Cedar Rapids, Iowa.
Mr. and Mrs. C. W. Bingham, Cedar Rapids, Iowa.
Mr. and Mrs. F. O. Harrington, Williamsburg, Iowa.
Frank H. Frey, Chicago, Illinois.
R. S. Herrick, Des Moines, Iowa.
Arthur Huston, Cropsey, Illinois.
Dr. W. C. Deming, Hartford, Connecticut.
J. K. Hershey, Ronk, Pennsylvania.
Hugh E. Williams, Ladora, Iowa.
C. W. Bricker, Ladora, Iowa.
Millard Harrington, Williamsburg, Iowa.
Dr. J. Russell Smith, Swarthmore, Pennsylvania.
Daniel Boyce, Winterset, Iowa.
T. J. Maney, Ames, Iowa.
J. F. Wilkinson, Rockport, Indiana.
Snyder Brothers, Center Point, Iowa.
Dr. R. J. Meyers, Moline, Illinois.
Rev. L. D. Stubbs, Cedar Rapids, Iowa.
Vance McCray, Cedar Rapids, Iowa.
Ray Anderson, Cedar Rapids, Iowa.
A. B. Anthony, Sterling, Illinois.
George F. Stoltenberg, Moline, Illinois.
John H. Witte, Murlington, Iowa.
W. L. Van Meter, Adel, Iowa.
Miss Elva Becker, Cedar Rapids, Iowa.
N. F. Drake, Fayetteville, Arkansas.
Prof. A. S. Colby, University of Illinois, Urbana, Illinois.

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*** END OF THE PROJECT GUTENBERG EBOOK NORTHERN NUT GROWERS REPORT OF THE PROCEEDINGS AT THE TWENTY-FIRST ANNUAL MEETING ***

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