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Wisconsin State Cranberry Growers' Association. Thirty-fourth [thirty-third] annual meeting, Wisconsin Rapids, Wisconsin, January 11, 1921. Thirty-third [thirty-second] summer meeting, pavilion, near ...

Wisconsin State Cranberry Growers Association
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**Wisconsin State
Cranberry Growers' Association**

THIRTY-FOURTH ANNUAL MEETING

**Wisconsin Rapids, Wisconsin
January 11, 1921**



THIRTY-THIRD SUMMER MEETING

**Pavilion, Near Nekoosa, Wisconsin
August 10, 1920**

LETTER OF TRANSMITTAL

To His Excellency, EMANUEL L. PHILIPP,

Governor of Wisconsin.

Dear Sir: I have the honor to submit to you herewith the Thirty-third Annual Report of the Wisconsin State Cranberry Growers' Association.

Yours respectfully,

MRS. S. N. WHITTLESBY,

Secretary.

Cranmoor, Wis.,
January 9, 1920.

THIRTY-THIRD ANNUAL CONVENTION

OF THE

WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION

Madison, January 9, 1920.

The Thirty-third Annual Convention of the Wisconsin State Cranberry Growers' Association was held in the Senate Chamber, State Capitol Building, Madison, on Friday, January 9, 1920. President Andrew Searles in the chair.

The meeting was called to order at 10 A. M.

THE PRESIDENT: We have expected that the Governor would speak to us this morning, but for some reason we have not been able to get in touch with him, so that we have concluded to proceed with the meeting and get the Governor to talk to us later on. We are scheduled to have a few remarks from Mr. Cranefield.

MR. CRANEFIELD: Mr. President and Members of the Wisconsin State Cranberry Growers' Association: I am indeed gratified to be called on at this time, and particularly so at the topic assigned me, "Fraternal Greetings." My first reaction is to say this, "Why fraternal?" and yet, considering the matter only for a moment, I knew that it was right, because we are brothers and sisters, as it were, because the State Horticultural Society aims at promoting the development of horticulture, which means a culture of fruits and flowers and vegetables. Now, if the cranberry is not a fruit, what is it? It is not a flower, it is not a vegetable, and therefore it must be a fruit. It was a long time, I must confess, before the State Horticultural Society recognized that the cranberry is a fruit. Since that time we have been doing what we can in our feeble way to recognize the cranberry and cranberry industry in Wisconsin, and I extend to you today on behalf of our association, not only greetings, but the offer of such help as we can give you.

I will, with your permission, go into the details of that a little further, in a moment. You are met here, as we announced, in joint convention with the State Horticultural Society. What I hope may occur next year is this—that you may meet with us here in the Capitol building, and if our convention opens on Tuesday, to continue for three days, that the cranberry convention might open on Wednesday, at the latest, so that you may be here at the same time our people are, be all together, come in and listen to apples and roses once in a

while, and we will come in and listen to cranberries once in a while. Heaven knows we need that. Not more than half the people know whether cranberries grow on a tree or underground.

In regard to the state fair premium list, there has been some criticism of premium lists at the state fair, and also at our convention. We do not know anything about cranberries, we take whatever is sent to us with the approval of your association, that is put in the state fair premium list and also on our premium list. This is what we want. We want you to appoint a committee to arrange a premium list that will be representative of your varieties, signed by an officer of your society and that is the list that will be used, and under no circumstances will any other be used. Now, it is up to you, as the boys say. I do not know anything about those varieties. The same way with the exhibit at the convention here. Make out the list that you want, and that is the list we will use. Now, we have appointed a committee on revision of the state fair premium list which will meet some time within the next three weeks, and they will work in my office revising the list of fruits and flowers. Within three weeks, try to send us an approved list, you can make out your list here and approve it and send it to me, so that it will be turned over to that committee and that will be printed and no other.

THE PRESIDENT: Ladies and Gentlemen, I am glad to be able to introduce to you our Governor.

ADDRESS BY GOVERNOR

EMANUEL L. PHILIPP

The committee that asked me to come up here made some apology for the size of the audience, but they did not need to do that. I spoke to an audience of one man at one time, up in Outagamie county. I had been invited to a cross-roads meeting; I was about two hours late and they had all left but one man. I stopped to talk to him and he said, "Now, I am very sorry that I cannot hear your speech; I am getting old, I am afraid this will be my last opportunity." I said, "My friend, I am not going to disappoint you. Now, you stand off there, and I will make my speech," and I did so, and I talked as long as he wanted me to talk, I asked him if he was satisfied, and he said, "Yes." So that you need not apologize for this little audience.

Now, I will welcome you to the State Capitol. You represent an important industry of the state, and we are glad to see you as an industry which the state has had and has now an interest in. The cranberry industry is probably not as large in Wisconsin as it ought to be. If I may judge of the type of soil that it requires to successfully raise cranberries, I would say that we have much land in the state that might with good results be appropriated for such use, land that will not raise anything else, hardly, of value, except a poor quality of marsh grass, or hay, and we would rather have cranberries than that.

Now, I confess that I know but little of the industry, it is one of the few things that I have escaped. I have not had any cranberry experience except as a consumer, but as a consumer I must tell you a little story. When I was a young man and was married I felt that I should make preparation, among other things I wanted a good supply of food in my house. I never had much to do with housekeeping; during my boyhood days my good mother took charge of it, of course, and after I got away from home I lived in hotels and restaurants where I did not learn much about it, but I felt among other things that I needed some cranberries, and I bought three bushels for myself and my wife. (Laughter.) Well, we had cranberry sauce and cranberry pie and we had cranberry pudding, I think for two years, and we resolved not to buy any more for two years, and we did not. We had been overfed on fruit, but we have begun to resume.

But, to get to serious things, we should encourage the production of all classes of food, and cranberries are, of course, food. Particularly these days when we hear so much about the high cost of living. That word is in every household and it is a general complaint. I have been asked by people of the state to do something radical to cut down the cost of living. It is alleged that there is a great deal of profiteering. I think there is. I have a suspicion that pretty much everybody is profiteering more or less, and I have said to the very loud advocates of radical measures that, "Very well, if we shall go ahead with the prosecutions, then we must first build a jail, because when everybody is profiteering, you have got to have a jail big enough to hold everybody." Now, I am not at all averse to giving the people as much relief as the state can, but you will appreciate, and I think all the people will, that in times like these it is pretty difficult to determine where to begin in the preventing of profiteering, when everybody is taking all he can get for what he has to sell. The real remedy against profiteering and high cost of living is to increase production, and when production will finally overtake consumption, that situation will take care of the prices, at least it always has and it always will. When we produce more than we can consume, when we produce more than the markets will take, or even all that the markets will take, if there is not an absolute shortage, competition will take care of the interests of the consumer.

But here is the trouble, and I think you people who are in the cranberry business will appreciate that as much as the farmer and the man who runs a factory, the tendency of the times is high wages and less hours. Well, now, that adds two factors to the cost of living. Higher wages may be justified, higher wages in many cases have been justified, higher wages in many cases have been absolutely necessary in order to give people the wherewithal to live, but when you add shorter hours to it there is a new item of expense, and whether we should ever be able to get back on our feet under these new conditions if they are going to be insisted upon, whether we shall ever be able to get back

to what you used to call normal conditions, is a serious question, if we are going to devote so much time to play.

I am perfectly willing that those who need sixteen hours of rest shall have it, but there are many of us who have gone through life so far and never had the experience of sixteen hours rest out of twenty-four, and we have lived reasonably comfortable at that. I do not believe that a human being is going to hurt himself by doing as much work as he can do without injury to the body, and I think a healthy man can work more than eight hours a day with profit to himself. I have had a long experience as an employer of labor and have met men in all walks of life. I have met men who worked sixteen hours instead of eight hours, and in my experience I have met a few, perhaps, who injured themselves by working too hard, I think that is particularly true among farmers. That is true of the original settlers of this state who dug out the stumps and who toiled to raise the rocks of the fields, those men and women worked so hard that many of them did shorten their lives. It is sometimes true in the city that some man who is at the head of a large business overwork, in other words, he does not get rid of his business cares, whether it is at his office or elsewhere, and he is injured, perhaps. But where you find one man who has been injured by overwork, there are so many thousands who have been injured by too much idleness. Not only because they did not work hard enough to keep the body in good form, but because of the vicious habits that idleness breeds, and I do not believe that the world is going to help itself, I do not believe that the people are going to do themselves any good by insisting upon these short hours of labor. Understand, please, that if it is necessary, let us say, for girls and young women, for the younger people who ought not to be worked too hard, let us say that for them it is all well and good, that perhaps it ought to be done, but for the mature man it does seem to me that he can afford to be busy more than eight hours a day.

Now, that of course enters into the cost of living, and so there are many things that are being exempted nowadays by the laboring classes that enter into the cost of living. I am not going to argue whether they are right or wrong, but I will say this, that if they are going to insist upon that, they are going to increase the cost of production for themselves, and they ought not to complain that it exists.

Let us take the worker on the farm. When I was a boy, wood was cheap. I remember when dressed hogs sold for three cents; some of the older gentlemen here can remember way back in the beginning of the seventies, wheat was the only cash product and it did not bring much. Everything that was edible that was raised on the farm was cheap, and that was from 1875 on. Well, now, labor was cheap then. When I was 15 years old I did a man's work on the farm, and I worked for \$16 a month. I have got men working on my farm today who get up at 5 o'clock in the morning and who quit at five in the afternoon; I have got to pay them \$75 a month as against my \$16. I got up at 5 o'clock and I worked until the work was done, always after dark. I was not the exception; everybody else did the same. The food which

we produced was produced cheap and it was sold cheap. Well, now, I do not see how we are going to raise cheap food when the farm hand gets \$75 a month; that means that he costs the farmer at least \$110, when he goes to work at 5 in the morning and quits at 5 in the afternoon, and goes to town with the automobile on Saturday afternoon. It is a new basis. Now, if we are going to have that kind of a basis, then everybody must be satisfied with the price that it costs.

I take it that you people who are operating cranberry marshes probably have the same experience, but time will solve it. We will get away with it some way. We always have and we shall again.

Now, probably I have said too much. We who talk all the time sometimes forget that audiences get tired and wish that we might quit, so we have to be careful about it. Again I want to invite you to the state institutions. We shall be glad to have you visit the departments. We are here at the service of the people, glad to see you; glad to have you come in, glad to have you tell that you are doing well, but even if that is not said, we expect a smile of greeting anyway. You will find the departments all open to you, except the treasury, we keep that locked. Now, with this word I bid you good morning and ask you to come and see me before you go away.

MR. WHITTLESEY: May I suggest that Dr. Shear, of Washington, has to go away by noon, and he has a talk for us, and if we do not give him an opportunity soon, we will miss the chance of hearing him.

THE PRESIDENT: I think we can take up Dr. Shear's paper at this time.

THE PRESENT CRANBERRY DISEASE SITUATION

DR. C. L. SHEAR

*Pathologist, Bureau of Plant Industry,
U. S. Department of Agriculture*

The longer we study cranberry diseases, the greater the number and complexity of the problems appear to be. This, of course, is in accord with the general experience of growers as well as investigators. We frequently hear experienced cranberry men assert that the longer they live the less they feel they know about the cranberry business and that if you wish to secure positive and unqualified advice you can get it much more readily from the inexperienced. This is quite natural for the longer we study the subject and the greater our experience in connection with it, the more we are impressed with the vast extent and number of the things we do not know and the relatively small number of things about which we have some knowledge.

The same is true in regard to our investigations of cranberry diseases. Each year we add small items to our knowledge, or at least

think we do, but at the same time we discover a multitude of things which we do not know and which need investigation. No sooner have we learned something about the nature, habits and perhaps methods of control of some cranberry disease than we discover several others. Thus at present a dozen or more different fungous diseases of considerable importance have been found besides false blossom of which the cause is unknown. The older fungous diseases, such as Early rot caused by *Guignardia*, Bitter rot caused by *Glomerella*, Hard rot and Tip blight due to *Sclerotinia*, have been studied, their methods of development discovered and in most cases methods of control are known. More recently we have found End rot caused by *Fusicoccum*, Dull rot caused by a species of *Phomopsis* and Black spot due to an undescribed fungus. End rot is widely distributed and frequently occasions considerable loss, especially in late varieties and during the period of storage and marketing. This is found in all the cranberry-growing regions. Dull rot has been found to occur more frequently during September about the time of picking or soon after. Black spot is a disease which is most prevalent on the Pacific Coast causing a black spot on the side of the berry and also attacking the young shoots and runners. This has not yet been found in Wisconsin.

According to our present knowledge the most prevalent and destructive diseases in Wisconsin are End rot, Hard rot, Tip blight and False blossom. Most of the other diseases have been found here, however, but usually not in sufficient prevalence to prove serious. According to our experiments in Massachusetts and New Jersey, most of the diseases except False blossom can be controlled by thorough spraying with Bordeaux mixture. Whether spraying is advisable or not depends in every case upon the probable profit to be derived from it. If the loss from these diseases is likely to be much greater than the expense involved in spraying, it would of course be desirable to employ this method. As a general thing, however, under ordinary conditions on Wisconsin bogs the losses would scarcely justify the expense. This question, however, must be determined in each individual case and is not always simple because the loss from fungous disease continues after the fruit is picked, packed and shipped, as may be indicated by deductions made from bills of sale.

In this connection, it is only in the past few years that much attention has been given to the problems connected with losses of fruits after picking. Our investigations have shown that in many cases the greater part of the loss from fungous disease occurs during harvesting and distribution. Various fungous parasites infect the fruit before picking but do not develop sufficiently to produce softening or rot until later. The development of these rots after picking depends so largely upon methods and conditions of handling that by proper precautions these losses may be very largely avoided. The important points to be remembered are that any bruising of the fruit from any cause increases the liability of rot. Therefore, the fruit should be handled with as much care as practicable. In this connection, berries

should be stored in the same boxes in which they are picked to avoid pouring over and bruising. Great care should also be used in packing.

The temperature to which the fruit is subjected after picking has a very important bearing on its keeping quality. The fungous diseases in general develop most rapidly at temperatures above fifty degrees. Therefore, every practicable effort should be made to cool the fruit to or below this temperature as soon as possible after it is picked and keep it as uniformly cool as may be until it is packed and shipped.

Ventilation is also of importance in conserving the keeping qualities of cranberries. Cranberries being in a living condition continue their life functions after picking and this requires a supply of oxygen, otherwise there is a tendency to smother and to deteriorate in quality as well as become apparently more susceptible to disease. For this reason a certain amount of ventilation or free access of air is desirable. On this account the cranberry barrel has been found to be an undesirable package so far as its bearing upon the keeping of the fruit is concerned. During the past few years experiments in packing and shipping fruit in half-barrel ventilated boxes has shown a considerable improvement in the keeping quality over fruit packed in barrels. Of course, where the time elapsing between the packing and the retailing of the fruit is short, this factor is of less importance but where fruit is to be shipped for considerable distances and may be kept in the original package for several weeks or more, it is a very important matter.

Our principal attention during the past few years, so far as Wisconsin problems are concerned, has been directed toward the False blossom and the questions connected with picking, packing and shipping of fruit. Doctors Stevens and Bergman have devoted such attention as was practicable to these problems. As to False blossom, we regret to say that this proves to be one of those diseases which is very obscure and complex in its nature and as yet its cause has not been determined. It does not appear to be a fungous disease as we have been unable thus far to discover any parasitic organism connected with it. On the other hand, some recent observations in Massachusetts and New Jersey indicate the possibility of its being of an infectious nature as it appears to have spread in some cases from Wisconsin to Cape Cod vines.

This is evidently a trouble which will require extended investigation of the most difficult and expert character. We have been unfortunate in losing Dr. Bergman who was making excellent progress in the study of some of these difficult questions. We expect, however, to continue this work as rapidly as funds and assistance will permit. Under present conditions it is exceedingly difficult to get and keep competent pathologists in our work on account of the low salaries paid and the competition from other institutions.

A study of the effects of water on cranberry plants during flooding made by Dr. Bergman should be of interest to all cranberry growers. Flooding during the growing season is frequently necessary to destroy insects or to afford protection from frost. In such cases the question always arises as to how long a period it is safe to keep the water on

the plants without injuring them. As a result of different practical experiences by growers in different localities and under different conditions there is more or less difference of opinion on this subject. In order to get exact information on this question, Dr. Bergman made a series of experiments by covering plants with water some in the sunshine and others shaded to give the effect of cloudy weather. These plants were submerged for different periods under both conditions and the after effects noted. Analyses were made to determine the difference in the amount of oxygen present in the water covering the different sets of plants as well as in the same water in which there were no plants. It was found that after three days on removing the plants from the water those which had been shaded were distinctly injured and the blossoms and some of the young tips killed, whereas those in the sunlight were free from injury. These experiments were performed on Cape Cod in the latter part of June while the plants were in bloom. It is apparent that the injury to the plants was due to lack of oxygen. The amount of oxygen in the water in the shaded tubs was reduced much below the normal requirements of the cranberry plant, whereas the oxygen in the case of the plants in sunlight rose very greatly during the day and dropped during the night or period of least light. This was due to the fact that in sunlight the leaves carried on their normal function of giving off oxygen in considerable quantities and thus provided in part for the respiration requirements of the submerged plants. These experiments seemed to indicate clearly that other conditions being equal less injury to plants will be caused by flooding in bright weather than in cloudy weather, at least during the blooming period, but as in all other cases, time, place and conditions must be taken into consideration. Do not therefore draw the conclusion that it is always safe to flood for three days if the weather is clear. For example, in New Jersey in late summer when the fruit is nearly grown and the water warm, more injury may be caused, especially to the fruit, by flooding during sunshine than during cloudy weather as in this case the effect of the heat upon the fruit is of greater importance than the question of oxygen content of the water. Under conditions as they generally prevail in Massachusetts and Wisconsin in the early fall when fruit is liable to injury from frost, the temperature is not likely to be sufficiently high to cause the scalding of the fruit even in sunshine. It is expected that Dr. Bergman's results will be published and available for distribution to cranberry growers later.

These experiments also have some bearing upon the practice of water-raking about which there seems to be some difference of opinion among cranberry growers. Doctors Bergman and Stevens have both devoted some attention to the question of water-raking but have not yet carried their investigations far enough to settle the questions involved. According to our present information, water-raking cannot be unconditionally condemned, as much evidently depends upon individual circumstances and conditions obtaining. It is apparently possible to water-rake berries under very favorable conditions with less

injury and subsequent loss from rot or spoilage than would occur in case of fruit subject to rot or badly handled after picking, which is raked when wet with dew or even picked dry. The particular variety of the berries, the prevalence and kinds of fungous diseases present, the character and conditions of the water, the rapidity with which the fruit can be raked and dried and the amount of handling necessary are all factors in determining the results of these practices. Where a bog has small sections which can be easily flooded, and where there are facilities in the way of drying crates with plenty of help for carrying off the fruit and quickly drying it and when good weather prevails, the fruit can probably be harvested with a minimum amount of injury. Whether it is safe or profitable to water-rake fruit in any individual case must be determined by the grower on the basis of profit and loss, remembering, however, that temporary profit may be future loss. If the fruit can be water-raked and handled in such a manner as to reach the consumer in good condition and return a better profit to the grower than could be obtained by practising some other method of harvesting, this would seem to be justification for water-raking.

In this case as in all others, the practice to be pursued must depend chiefly upon the question of profit and loss and the practicability under the circumstances and conditions involved. Wherever it is possible, however, to improve methods and conditions without a sacrifice, it should certainly be done.

I know, however, from experience, that cranberry growers are public spirited individuals and take an active interest in the permanent improvement of the industry and the betterment of conditions generally and will not always be guided in their methods and practices by the immediate prospect of getting a few more dollars' profit. To attain these higher ends we should take every opportunity both in practice and precept to improve cultural conditions, grow better fruit and raise standards generally so that we may have the satisfaction of feeling that we have contributed something of permanent improvement and value to the property which is temporarily in our keeping and to the industry in which we are engaged.

DISCUSSION

MR. LEWIS: I would like to ask what Dr. Shear refers to as the hydrate? I am not sure that I am familiar with it.

DR. SHEAR: I am not sure what the common names are. You may not have it here. It is a white growth in the interior of the berry, and it becomes firm during the winter, slightly yellow in color. You have seen those berries—seem to be filled with white, cottony growth.

QUESTION: Brown color?

DR. SHEAR: Yes, a dirty, yellowish brown, they usually turn yellow in the center.

QUESTION: Does it ever turn absolutely black?

DR. SHEAR: There are one or two different fungi that do that, we are not entirely clear which of those is most common. In this case

there is a thing we call black rot, in which the berries finally turn black in color, but that is comparatively rare, in my experience.

MR. LEWIS: We have had a considerable amount of that this year on a new section, very large in size, but in sorting out the berries from the sorters' table, it showed a lot of these very large, full grain, black berries, absolutely black. They do not get soft like some of the others do, do not rot, but absolutely black. But it is nothing permanent. It has appeared on the new plantings, and disappeared as they grew older. I think it is largely due to the fact that the berry comes in contact with the soil and that is where the berry starts to rot.

DR. SHEAR: I am not quite sure what that might be. I would be glad to receive specimens of these curious phases and try to discover the cause of the trouble. I wish you would send me a few of those, Mr. Lewis.

MR. LEWIS: They do not get as soft as the other rots.

MISS HUYCK: We have quite a few of those. They come in from the field, come certain years, some years we do not get any, some years we have quite a lot in our trays.

DR. SHEAR: In a particular variety of berry?

MISS HUYCK: No, never a particular variety.

DR. SHEAR: We have a dozen or fifteen different fungous diseases that we have discovered in the cranberry, and the characteristics about these is a tendency that is not always very clear; but in this case that I mentioned it seems to have a distinguishing character, but I am not sure what one of our groups of diseases it comes in.

THE PRESIDENT: Are there any other questions?

MR. LEWIS: Would they be of any value if the specimens were frozen?

DR. SHEAR: No, that would not make any difference. I do not think so. There is this question of water raking that I should be glad to have discussed.

MR. LEWIS: By the way, these were all in the hand picked berries, new section.

MISS HUYCK: We pick all of our sections in water, and we have some of them that way, and we have had them this year for the first time.

MR. LEWIS: I had another question that possibly you can tell me about. That is, after cold weather arrives we use oil stoves in order to raise the temperature in our warehouses, and I know that oxygen is very necessary to the life of cranberries, both before storage and after, and that oil stoves consume the oxygen in the room, at least that is my understanding, I am not quite clear on it. Now, would there be a detrimental effect on the keeping qualities of berries by using oil stoves for heat? We used those oil stoves this year; our warehouses are tight during the cold weather; we could not burn those oil stoves more than about 36 hours, they would start to smoke and go out. It was plain that the oxygen was exhausted. Now, if it is exhausted in the air, I should think it might have a detrimental effect on the berries. Could you say whether it would or not?

DR. SHEAR: I should think, Mr. Lewis, in that case, that the simple indications are, if you had exhausted the oxygen to such an extent that the lamps would not burn, that it would certainly be detrimental to the keeping quality of the fruit in that room.

Of course, just how much you can do in that direction without causing any injury would depend, first, upon the quantity of fruit that you

had, and the amount of air space in the room, and the time that you burn your stoves, all those problems. I should think you had reached the danger point whenever your stoves began to fail to burn from lack of oxygen.

MR. LEWIS: Coal stoves consume oxygen just the same.

DR. SHEAR: Yes, but probably not to the same extent. There is more or less continuous draft you get in connection with your flue with the outside air, that would tend to improve conditions in that respect.

MR. LEWIS: There does not seem much air to come down the chimney.

DR. SHEAR: No, but you have got to get air inside. If you produce a vacuum in the room, you have got to have air from the outside.

MR. LEWIS: Probably the ideal condition would be to have a steam heating or hot air plant.

DR. SHEAR: Yes, that would be far more satisfactory.

MR. BARBER: In regard to ventilation, will opening of windows and doors be sufficient, or do you think something more should be practiced, and how tight should they be packed? In packing cranberries close together in crates, I have a suspicion that we have done too much of that, trying to put them in too small a space. I am especially convinced that this year my berries in one of our packs, I think they were packed too close together in the warehouse, because they had a sort of musty smell, although they went dry into the warehouse, there was a musty smell as they went over the machine. I want to know if others have noticed that tendency.

THE PRESIDENT: I have noticed that where the crates of berries were packed too close together. We are very careful to leave an air space between the walls and the crates of at least four or five inches, and then the different tiers or courses of piles of crates have a vacuum of quite a few inches, allowing the air to circulate through the piles of crates.

MR. BARBER: I wonder if any forced circulation would be necessary when the weather is unfavorable to natural drafts through openings. I visited some of the warehouses over in the Mather section this year, I was surprised to notice the different conditions, the methods of piling and storage, and they seemed to come through in better condition, in spite of better care that we have taken.

THE PRESIDENT: How are the windows in your room?

MR. BARBER: We have what are referred to as half-windows, and the warehouse is 100 feet long, 35 feet wide and has 8 windows on each side and a doorway on the end, also an open elevator shaft in the center.

THE PRESIDENT: Do you keep those windows open?

MR. BARBER: We keep them open except in this muggy weather and where the air seems too damp, if there is too much moisture in the air the berries seem to sweat. We do not sort berries during muggy weather, because with the utmost care they will have a dampness on them. That kind of day we close our warehouse.

THE PRESIDENT: My opinion is that you have piled your crates of berries too close together, not allowing any circulation of air amongst them; then when your windows are open the air goes over them and does not circulate around amongst the crates as it should.

MR. BARBER: I think it was in a corner, in a place where we did not get enough circulation; I was wondering whether some forced circulation would be advisable.

THE PRESIDENT: Well, I prefer to put in a window. If you waited to start up a forced circulation, you would not get it.

MR. BARBER: Some of the growers in the Cranmoor region are absolutely against basements. I do not know whether it is because they cannot build them over there, but we have been using half basements and we have been usually well pleased with the results, about half under ground.

THE PRESIDENT: I think that your basement is good; I am pretty well acquainted with your basement.

MR. BARBER: I refer to the new basement on the switch track. You have not seen that.

THE PRESIDENT: Dr. Shear would like to hear the water raking of cranberries discussed, and while the Doctor is with us only a short time, I think I will call on a few of the growers to express some opinion on the subject. I will call on Mr. M. O. Potter.

MR. POTTER: I am strictly against water raked berries, unless I have to rake them. When I have to rake them that way, I do. I have found sometimes that it pays, but this year we figured we raked only two hours in the morning. That is the only water raking. I do not advocate it at all. There are very few marshes in this state that will stand water raking of berries, for the simple reason that the vines are not high enough to hold the berry clear from the ground. Now, if the vines are thick enough to keep the berry clear from the ground, if you have a part of the sections adjoining that will seep through and you get water on the surface and that forms little pools, and if you will get a half hour or an hour of sunshine in that pool of water, it will warm that water enough so that you hurt the quality of the berry. There is no getting out of it.

MR. LEWIS: If your bog were reconstructed so that would not happen, you would not advocate that?

MR. POTTER: I do not think that would be so bad. The idea is to keep that berry absolutely out of the water after the water is taken off. And the sections should be small and the water very easily handled.

THE PRESIDENT: Mr. Potter, I think Mr. Lewis asked you, if the section were so constructed that you could confine the water entirely on that field, say, after one day's raking, and they were spread in drying trays at once, so that they were in a good, airy place, where they might dry out quickly, do you think there is any possible injury?

MR. POTTER: Yes, I do, for one reason. I explain it this way,—you are turning your berry wrong side up, the side that has had no access to the weather, really, you have got your tender side up. Now that berry, if the weather side is down, it comes maybe within one-half inch of the surface of the water. Now, you cannot stop within an hour of the sun shining that half inch of water being changed in temperature to a great extent. You notice if you drink some of the water, a little ways down, you will get a cooler water, it comes from below; that takes the place of the water that you put aside, and I contend that you turn the wrong end of the berry up. If you could keep the same side up, that which was naturally grown, and had the sun and all the rains and weather, that would be different, but you are getting the tender side up, and it sticks up, and the sun bears on it, and that is the place where the berry gives out, and it is done in a very few minutes

after the sun comes out good and hot on a hot September day. If you have cool weather, it warms very quickly.

THE PRESIDENT: Miss Huyck, perhaps you will tell some of your experiences in handling cranberries by water raking methods.

MISS HUYCK: We have about 16 acres producing, most of the bogs are more than an acre. They are large to flood, sometimes we are not able to rake a section in a day, sometimes the water is on 24 hours, it has been known to be on 36 hours. From these 16 acres we have produced 1200 barrels. Some of these 16 acres are very weedy, we are not getting the full berries from them. We do not find that we have many scalded berries; we do have along the ditches. I do not advocate, as a rule, keeping water on longer than necessary, but our bogs are so laid out that it is impossible to get the water on and get it off again to keep the rakers busy, but we do get it off as fast as we can, and we have very few scalded berries. I do not know what we would do if we had many more berries off the same territory. I do not think many berries have been lost by scalding, and our berries are taken out from the picking boxes just as soon as they can be taken off the bogs, and put in drying crates away from the sun. They are allowed to dry outdoors, and as soon as they are perfectly dry, the crates are put in the berry shed, where they have good ventilation. We have a shed that has no sides, it is up against a building, the north end is tight. Until they are thoroughly dried they are kept in that shed as we have it, to have the protection from the rain.

THE PRESIDENT: Ordinarily you do not put them under the shed, unless there was some bad weather.

MISS HUYCK: We put them under the shed if we are afraid of frost. If the berries are nearly dry, they are left out, rather than have them go through the sticky period again, protect them as much as we can. We leave them out where the wind blows on them and they dry out quickly. I think we have very little loss from scalding. We have one variety that we have complaints about, but I find that berry is universally acknowledged as a poor keeper, but the other berries we have no complaints about, and our berries are all paid for and they are gotten out and sold in good condition, and if there was anything wrong about the water raking, I am sure we would have found it out before this time.

THE PRESIDENT: How many years have you practiced this method of harvesting?

MISS HUYCK: I think four years. I think we picked by hand two years, and then four or five years.

THE PRESIDENT: My recollection is you harvested by hand picking one season and part of the second season.

MISS HUYCK: Part of the second season, because the weather was very bad, and we were not sure whether it was advisable to pick by the water raking method, but the pickers were striking for more money and the weather was bad and we had all sorts of difficulties, and we just brought the rakers in and raked them, found it entirely satisfactory and much less expensive. We got through our harvest in half the time, and with less than half the people.

MR. HEDLER: Do you think wet raking is much cheaper than dry raking, compared with hand picking?

MISS HUYCK: You see our bog was new when we hand picked, and I think our cost is very much less now. I do not know anything about dry raking as compared with hand picking. I do not know anything about dry raking.

THE PRESIDENT: I should like to hear from Mr. Barber.

MR. BARBER: There is a difference of opinion regarding the matter, but with us it is a straight matter of business, of profit and loss, and if we can find that the keeping quality of our berry is injured by water raking, we expect to discontinue it, but up to this point we have had none. We have made careful comparisons of both hand raked and water raked and the dry raking and water raking, and in fact the only difficulty I have had this season with berries that are supposed to be dry raked, but in the anxiety to get the crop off they would start with the dew on in the morning, and those berries in fact were almost as wet as they came off, and they did not take pains to dry as we had on the bog where we practiced water raking. Where we practice water raking we are prepared to dry them, and we prepare to get them together perfectly dry.

Another thing, we have plenty of water there, always have had, and we let a stream of water go over it all the time. We never stop when we are water raking, we flood it and still have a stream of water, cold water, running into the section, also running out at the lower end, keeping a circulation all the time while we are raking, and we have yet to discover any disadvantage to the water raking. Our water is clean and clear in our reservoir, and it is on a creek which has considerable fall. I doubt whether water raking would be advisable on some of our bogs where our reservoir is stagnant. Where there is not much of a running stream, and where the water has a tendency to accumulate scum, or has a sediment, I would not advocate it in such cases, but where you have a good supply of cold water, can separate the sections while you are handling it, drain one section or the other, I believe in water raking. I am free to say that I do not think conditions are at all times favorable, and I would not advise everybody to adopt it. We have not noticed any difficulty on the blossom end. If we have any disease that threatens us, it is nearly always at the stem end, where it starts, or the side where it lies on the wet ground, but the blossom end seldom shows any difficulty.

Mr. Potter's son, who is an expert, is doing water raking to some extent. He looked at our berries the other day, and he said, "They are like bullets."

DR. SHEAR: I want to point out what I consider very important factors in the success of this work, and that is the fact that the work is done under running water. If you have a continuous flow of water which keeps renewing, it avoids the possibility of raising the temperature to any considerable extent over the particular place, so that the fruit will not have a chance to get warmed up, as in the case of Mr. Potter, and I think that is an important factor to determine, whether you get injury from scald. Of course the time element is important, as to how long it will take to get your section watered and off again. All those factors determine the result.

I hope you will all understand my position in this connection, and that is, that it is largely a case of the individual conditions and problems involved. The old saying is, what may be food for one may be poison for another. What may be profit for one under certain peculiar conditions may be loss for another. You cannot determine this thing on any general principle and say, "This method is absolutely wrong and that is absolutely right." That is out of the question. If there is anything I would like to impress upon you it is the fact that it is an individual problem.

HISTORY AND ACHIEVEMENT OF THE CRANBERRY LAKE DEVELOPMENT

MR. ALBERT HEDLER, Minneapolis

Ladies and Gentlemen of the Wisconsin Cranberry Growers' Association: It would be presumption on my part to try to tell you how to raise cranberries. Up to this time I might say of myself and our company that we have not yet raised cranberries. We have just been getting ready to raise them. I used to be a school-teacher and if there was anyone who tried my patience more than an unruly youngster it was the person who tried to tell me how to do it when he himself had never tried it. It is rather amusing, is it not, to have somebody tell you all about the proper training of children in a home when he has had no children of his own to bring up.

One day a friend of mine met me and told me that he was going into the cranberry business. Up to that time I had a very vague idea about cranberries. I thought the Indians furnished all the cranberries from the wild marshes and that the time would come when this wild product of the marshes would disappear like other wild things before the advance of civilization. You see I did not even know that cranberry culture was a civilized business. And some of my early experiences very nearly persuaded me that it was not.

I have seen some of the marshes that have been developed in the various cranberry districts of the state but I have never seen a marsh like the one at Cranberry Lake. It once upon a time was a tamarac swamp. The trees had been cut off and burned off but the roots were there, thousands of cords of them. When we scalped the 86½ acres now under cultivation we pulled up tamarac roots and piled them in great heaps every few rods and when they were dry enough set fire to them and lighted up the country for miles around. The growth of sphagnum moss and brush reached a depth of three feet and more and this we removed down through the roots. It would be almost impossible to calculate the tons of stuff per acre but it seems to me that we must have removed thousands of them. When we cut our ditches we were obliged to cut through what seemed an almost solid floor of tamarac roots.

We bought this land from a man who in turn had purchased it from some lumber company years ago. He had a piece of land that could never have been used for anything but a cranberry marsh and he was particularly fortunate to find some one who did not know anything about raising cranberries or he could not have sold it at all.

We were told that in order to raise cranberries successfully we must have not only the right kind of soil but also sand and water. The sand must be near by, naturally, and the water must be higher than the marsh so that it could be put on the marsh and taken off again by gravity. Yes, there was water there and sand. The sand was in the bottom of the lake and the lake was just high enough so that in seasons of ordinary rainfall it would drain lazily and sluggishly through a creek running down through the area to be developed.

There was not a single man who was interested in this venture who knew anything about raising cranberries. Many of the incorporators of the company did not know how cranberries were grown previous to the time they became identified with this proposition. While I was selling stock for the company I was often asked by prospective purchasers how cranberries grew, on trees, bushes or vines. I think I am safe in saying that not one man in ten knew that there were cultivated marshes in the United States.

Naturally we turned to the state authorities for advice and counsel. The state expert tested our soil, made a report, made a report on the water and the sand and told us that we had the proper drainage.

But right here is where we made our first big mistake and we made lots of them. We have learned through costly experience that the fact that water runs down hill is not all there is to the water question. I am now interested in another marsh in Minnesota. The first thing that we did after we had assured ourselves that the property was suitable for the purpose of growing cranberries and after acquiring the land was to get a competent engineer to get every level accurately of the fields to be scalped. Instead of relying on water levels in ditches we have made our beds so level that the elevation in the fields does not vary over an inch or two. At Cranberry Lake we have fields that have a difference in the elevation of 18 inches and we will find it necessary to put dams through these fields so as to correct this to some extent.

The water from the lake was naturally to supply our marsh for flooding purposes. But we soon learned that this would mean a dam around the west edge of the lake, not a little dam a few rods long, but one that was nearly a mile long. An engineer on the place would have been able to show us that after only a cursory examination. But we bought a dredge, a large clam shell digger, and put it to work. We threw up a dam and made it of the soft material, muck, which we found at the edge of the lake. You can imagine what the dam was like. It has taken years to make it solid enough to withstand the greater water pressure which naturally accumulated as the water rose. So we have been obliged to keep weighting down this dam until now it looks as though it were a substantial clay structure. But it will require eternal vigilance for some time to come.

We sent a man over there to direct the work during the first season of development who did not know anything about cranberry marshes. He was a practical man and willing, but he was handicapped. He had no plan to work by and the state did not seem to be able to furnish us with proper plans.

Toward the end of that first season I took over to the marsh two prospective buyers to show them the progress we had made. I had been told that there were about twenty acres ready for sanding and believed it. Unluckily these two prospects were retired farmers. When I said we had about twenty acres ready they said that we did not have ten and such proved to be the case. It is needless to say that we did not sell these men any stock.

By this time we had begun to realize that we were working in the dark. A bright mind suggested that we had a fortune in the sphagnum moss which was present in enormous quantities. It would be a shame to throw away several hundreds of thousands of dollars. So we built a moss cleaning machine and spent much of our time and effort trying to make that fortune out of sphagnum moss. That's another hallucination. You cannot be a moss merchant and a cranberry grower at the same time. Several thousands of dollars and a lot of valuable time were lost in this line of effort.

Next we heard of a man who had raised cranberries and who was looking for a job. We hired him. He did know something about cranberries and he did plant during his first two years about 22 acres. That was pretty slow for a cranberry marsh which was going to put in 1,000 acres more or less, 22 acres in three years. Just think of it, we really once thought that we could put in 1,000 acres.

About the first year also some unlucky star led one of these so-called geniuses to our office in Minneapolis. This genius claimed he could do anything with a steam or gas engine. But he had never run up against a cranberry marsh. We hired him to set up and run that big dredge. He also built us a gas tractor that ran on tracks and we bought some wooden dump cars. The gas tractor could pull itself along the track pretty well but when you hitched a load on behind there was no locomotion to speak of. But in some way we succeeded in sanding that first six acres during the second summer. We sanded in the summer because we were obliged to dredge our sand from the bottom of the lake, dump it on the cars and haul it to the marsh. While engaged in this work this genius was observing the work of scalping and evolved the plan of scalping by gas power. He came to Minneapolis and persuaded us that he could build for us such a machine. At an expense of about \$1,800 he built the machine all right. But when we put it to work on the marsh it not only scalped but dug holes deep enough for a well. Luckily the machine broke down after he had scalped less than an acre, but we still have places on that marsh that have settled and that are too wet because we have never been able to properly fill those holes dug by the scalping machine. In the fourth season we purchased a dinky locomotive and some steel cars and during that season cleared, scalped, sanded, and planted 31 acres. In the fifth season we developed 32½ acres. We were learning, you see.

I would not dare today to show anyone the prospectus we got out when we were selling our stock. In fact the State Securities Commission would probably have us prosecuted for obtaining money under false pretenses or by frauds were we to attempt to use that prospectus now. But I wish to assure you that we had no idea we were not telling the truth.

The fact of the matter is that our company was organized by the same financier who later organized a company in the Mather district, I think it was, the fate of which some of you are more or less familiar with. I have understood that this financier later became a fugitive from justice and that he left many mourners behind.

There were few of us who put our money into this venture in those early days who had any idea that we would some day be obliged to take up the work of development ourselves. We understood that all we would need to do would be to put up the money for development and then in about three years we would reap such dividends that we could spend all our winters in California and our summers in Europe or in the mountains.

I might tell you about a little matter that came under my observation in the case of that other company which was organized by this same financier. A man very well known in Minneapolis and all over the state was induced to invest \$5,000. After the first year he was paid a dividend of 14 per cent. He was very much pleased. In fact he wrote the company a letter in which he most graciously expressed this pleasure. The financier had this letter photographed and his agents showed copies of it all over the state and on the strength of it sold stock to scores of subscribers.

But at any rate we got our experience. We have by no means solved the problem of growing cranberries at Cranberry Lake. We have demonstrated that we can grow them because we had a crop of 1,800 barrels there this year and most of them came from that first 22 acres. The prospects for next year are very good and we think we will have a much larger crop there next season. The marsh is well planted. We realize the importance of proper sanding, of proper care, of re-sanding when necessary, of the many things that must be done and of the eternal vigilance necessary to grow cranberries.

Much that we have learned of the business we got from Mr. Andrew Searles. He has grown cranberries successfully and can show other people how to do it. In view of our experience I think it is safe to say that I know something about raising cranberries. But if I were to put in a marsh of my own, no matter how small, I would not do a bit of work on it until I had the area to be cultivated mapped and planned as carefully as I would draw the plans for a building. Even before I purchased the land I would have a competent engineer survey the property and prove to me in detail that the scheme was practicable. In other words, I would take no steps in the dark. It may cost too much.

There is need in Wisconsin of a good practical cranberry man who can devote his time to showing growers how to put their marshes in in the right way. Such a man could have saved us unlimited money and much valuable time. I would suggest, if it has not already been done, that this matter be brought to the attention of the proper authorities in a forceful way and that another attempt be made to secure the right kind of a man for such a place.

This far we have been raking our crop on the water. There can be no question that it is much the cheaper way. There seems to be a prejudice against it because it is said that the berries do not keep as well. During the three years that we have harvested we have found no such difficulty. The main thing is to get the fruit thoroughly dry before taking it into the warehouse.

I can appreciate that the National Sales Company must have meant much to many of you. At any rate the cranberry grower does not seem to be at the mercy of the buyer because there is a proper distribution of the product. I do not think that the time will ever come again when we will be obliged to consign our crop to the commission merchant and allow him to make us whatever returns he may see fit. I have been told by many dealers that there is not a better organized group of producers than the cranberry growers. It may be in some cases perhaps one or the other may do better independently but generally speaking I am of the opinion that in this case like in many others "in union there is strength."

My experience in the last seven years has been most interesting. I have become glad to be known as a cranberry man. It has always seemed to me that the man who produces something is at the source of real wealth. It is true that in many cases the work of the producer has been exploited by some other fellow but the producer is rapidly growing wise and is refusing to do all the work and let the other fellow take all the profits.

Once some time before the war when I was trying to interest a commission man in our cranberry marsh here in Wisconsin he said to me that it would not be good business for him because he was turning his money about every month at a profit of 2 per cent. That meant 24 per cent per year. I happened to be on the committee appointed by the mayor of Minneapolis this year to investigate the causes of the high cost of living. When I interviewed this same commission merchant and asked him about his profits and called his attention to the remark he had made to me years ago about his profits he had most conveniently forgotten that he had made such a statement.

I do not think it possible that we can ever get along without the distributor. But I do think that the organization which you have has made it impossible for the distributor to cheat you or the public either.

There are so many phases of this work that are interesting that I am sorry that I did not get into this business years ago. But the grower is doing the most interesting work and the most useful work of all. I am glad therefore to be one of them, one of you in other words. The kindly reception I have always had when I have been fortunate enough to be among you has made me feel at home even when I was still under the impression that in a few years I would be able to show you all just how it must be done. I have, I think, arrived at the stage of my learning when I have learned how much there is that I do not know. When one has arrived there I think you will agree with me there is some hope that one will learn more.

I have hoped that the day would come when we could invite you to have a summer convention at our marsh near Phillips. And it is possible that this time may come. At any rate I am going to keep it in mind. But I am sure that our company will at all times be glad to have you visit our property. Many people stop there on their way through from Ashland down the old Wisconsin Central Line, now a part of the Soc

Line system. If you happen to be up that way be sure to stop and see us.

We have not yet made much money, but there can be no question but what even we will be reaping some reward soon. We already feel that we have received some reward in the knowledge that we have taken up a venture that has worked out in spite of the hardships and seemingly unsurmountable difficulties.

THE PRESIDENT: I will say this for the Cranberry Growers' Association, that we are glad to welcome Mr. Hedler as one of our members or fellow growers.

Mr. Whittlesey, I believe, asked for the privilege of speaking directly after Mr. Hedley. We will be pleased to hear from Mr. Whittlesey.

MR. WHITTLESEY: Mr. President and Fellow Cranberry Growers: The few words that I wish to say to you I have had written down, because I thought I could present them in good form and I will prove to you that I know what brevity is. The words I would like to have gentle, but I want them harsh or vigorous enough to command your attention for the subject is perhaps of more importance by 100-fold than any other subject that we discuss here today. I am simply touching the high places. There is much more that might be said than I have written. It is, "Co-operative versus Independent Selling of Cranberries."

CO-OPERATIVE VERSUS INDEPENDENT SELLING OF CRANBERRIES

S. N. WHITTLESEY

There are a great many different views or opinions or attitudes, and if these different views are directed at one and the same object, proposition or problem then these views can scarcely all be right.

The writer ventures to express his views, and if he is right, all of you will of course embrace the idea and put it in practice. If he is wrong he invites your criticism. And if he offends he wishes to be forgiven.

Now the subject or problem against which these observations are projected is the "Independent Cranberry Grower" in the United States. East or West. It is assumed that argument is unnecessary to establish the absolute importance of Co-operation to the successful marketing of Cranberries, but the limit or extent of co-operation seems greatly questioned by the conduct of the Independent Growers.

No one probably has the hardihood to assert; or the credulity to believe, that we could enjoy any decent measure of success in the business of cranberry growing if we were all independent growers. Most of us have tried, we know it cannot be done. Another fact we probably

all know, whether we admit it or not, is that without the very extensive and expensive—one-eighth million dollar advertising campaign, not all of the crop of 1919 could have been sold even at prices very much lower than were obtained.

The cost was all paid by the Co-operators—the Sales Company. They got about half the benefits—The Independents, the other half. Co-operation in marketing means The Sales Company, which should include every single cranberry grower. It is the manifest moral duty as well as clear material gain for every cranberry grower to be a member of the Sales Company. Every individual member has an even chance with every other member. The burdens and benefits are distributed as evenly and equitably as is humanly possible.

The controversy over Dry Versus Water Raking is no good reason for refusing membership.

The product or pack of every single grower can be and ought to be sold for what it is worth by the one selling agency. Just as far as we go into Independent Competitive selling we are into a Dog Eat Dog Performance, that is barbaric and ruinous.

If there comes from any source the charge that the Sales Company is a pernicious combination or conspiracy in restraint of trade, answer that those making such a charge must be either insincere or uninformed. The price set upon cranberries must be reasonable or they will not go into consumption, except in limited quantities, so that exorbitant price stops consumption, so also cut or falling price stops consumption, because the movement of the crop to market stops. This, because car lot buyers will not handle or further buy cranberries on a falling market, and a falling market is a sure bet with competitive selling.

Co-operative selling or the Sales Company including every grower could start prices right and maintain them to the end without a flicker, and could largely control or moderate even retail prices, preventing extortionate prices to consumers and profiteering that hinders consumption. While Independent competitive selling has no influence or control whatever. Self interest as well as ethical considerations and the general welfare including the consumer appeals to every Cranberry Grower to be a member of the Sales Company.

January 5, 1920.

TO THE MEMBERS OF THE WISCONSIN CRANBERRY GROWERS' ASSOCIATION:

Ladies and Gentlemen: I regret very much my inability to meet with you today. As is well known by you, we have passed through a year of unusual uncertainty, and that the cranberry growers have sold their crop without great loss I count extremely fortunate. I believe any good survey would prove that this result is due mainly to the good judgment of the members of the Sales Companies associated together in creating and sustaining an unusual demand for cranberries by way of a National Advertising Campaign, which enabled cranberry sales to overcome the great obstacle of sugar shortage.

It seemed to be the uniform opinion of the trade generally that because of the scarcity of sugar nothing but a short crop of cranberries could be sold. It was very difficult, however, for many of the trade, or the growers, to appreciate, at the beginning of the season, the probable extent of the sugar shortage. It was hard for us to realize it ourselves, although we were fully and correctly informed in advance by the sugar authorities as to just what we could expect for each month as the season progressed and as to what part of the country would be short of sugar and what part would likely have the greatest supply.

This seemed to make it absolutely imperative that a broad, national advertising campaign for cranberries be started early in the season and continued consistently in the territories where cranberries could most likely be consumed in greatest quantities. To do this the members of the different Sales Companies have contributed for this campaign a total of about \$120,000.00 for advertising.

I feel that the advertising was well planned and well handled. We ran advertisements in many of the October and November magazines, such as the Ladies Home Journal, the Woman's Home Companion, Good Housekeeping, Delineator, Pictorial Review, Designer, Woman's Magazine, McCall's Magazine, Peoples Home Journal and Farmer's Wife. We also advertised in the Nebraska Farmer, Iowa Homestead, Ohio Farmer and Wallace's Farmer. We ran advertisements in the daily papers, Sundays and weeklies, in the principal cities from Denver to New York City including Canada and as far south as Kansas and Memphis, Tenn. Also through all the principal cities of Canada. We are still advertising in the daily papers of Minneapolis, St. Paul, Duluth, Milwaukee, Chicago, Omaha, Des Moines, Detroit, Toledo, Indianapolis, Cincinnati, Cleveland, Pittsburg, New York City and Boston. We will also have an advertisement in the Farmer's Wife for the month of January. We had a full back cover page, in colors, in the Literary Digest in the month of November, and a full page in colors in the Sunday edition of the New York Tribune during the month of November. We have put advertising matter in all barrels bearing the Eatmor Brand, by which we called the retailers' attention to our advertising. We have distributed hundreds of thousands of leaflets showing "Ten Ways to Eatmor Cranberries" throughout the United States. We started propaganda to urge retailers to make special sales of cranberries at "eight pounds for \$1.00." We made a special feature in our advertising of *cranberry jelly*, bringing out the point that "eight quarts of cranberries and two and one-half pounds of sugar make ten tumblers of delicious clear jelly." We believe our jelly advertisement was very effective, creating a permanent increased consumption for cranberries. The result of this advertising is that our demand has been steadily sustained throughout the territory in which we advertised.

The trade at no time have felt safe to speculate and generally did not buy ahead of immediate wants, but bought steadily and continuously, which is a very satisfactory condition to have. As a general thing the trade have supported our advertising campaign in a very loyal manner and have given decided preference to American Cranberry Exchange berries, especially in the larger markets. We believe that if the cranberry growers of the country wish to prosper in the face of the high cost of production and labor conditions that they must create, by way of advertising, a permanent demand for cranberries far in excess of any probably supply, so as to enable them to ask a price that will give returns sufficient to justify the high cost of labor and risk of growing berries.

I believe that it will cost the grower on an average of \$7.00 a barrel to produce good cranberries if he takes into consideration the hazard of his investment, interest on his investment, pay for his time, and the irregularity of his crop, etc., and these must be counted.

While I am greatly pleased with the average prices received this year in the face of the most adverse conditions I recognize that cranberry growers cannot prosper season in and season out on the basis of the present cost of production, unless more money is secured for the crops. I believe that can be secured if the cranberry growers will themselves get together and support a national advertising campaign consistently for several years.

The proof of it is that the California orange growers have so created a demand for oranges that they can raise 50,000 car crops, even with the present high cost of labor and make more money per tree than they were making fifteen years ago with 15,000 car crops. The raisin growers have likewise proved it by advertising. They have so created a demand for raisins that they can sell the largest crop of raisins they ever produced at prices unheard of ten years ago, and making more money per acre on their raisins than they ever thought of making prior to their getting together and advertising.

I am confident that cranberries will respond to advertising better than most any other fruit. They are less generally known and are less generally used than other fruit. Consequently, a very small percentage of our population understand the eating merits of cranberries and have not universally acquired the taste for them. Once the public is taught how to cook them and serve them they will acquire the taste and once the taste is acquired success is assured, and we can sell any size crop profitably. This cannot be done from any other source or by any other people than the cranberry growers themselves and cannot be done except by co-operation and all contributing to the campaign.

Now, there is certainly a great advantage to all cranberry growers of the country that there is now in existence strong co-operative growers sales companies which guide the market and steady the distribution. No small group of growers can themselves guess as to when is the proper time to sell or what is the proper price to ask. Only a large organization can competently gather information that will guide them as to what price will sell their whole crop to the best advantage. We have to deal absolutely with the law of "supply and demand." The supply is regulated by the crop and after it is once produced it cannot be reduced, unless we throw it away, and it cannot be increased for that season.

Cranberries, or any fresh fruit, must be sold while it is in prime condition. They cannot be held for ransom.

It is imperative that we be able to gather such information as will give us a competent idea as to probable demand in order intelligently to start the price that will fit the demand to the crop and thereby sell the whole crop at its full value. This is the job of the American Cranberry Exchange.

I wonder if some growers appreciate that prior to the organization of the Sales Companies we had what would be considered now ridiculously small crops and yet with these small crops low prices were secured. Prior to 1906, the year the Wisconsin Cranberry Sales Company was organized, the largest crop produced was 380,000 barrels, which was in 1903. During that year I myself bought late berries at from \$4.50 to \$5.50 a barrel. In 1904 the crop was only 330,000 barrels, yet we only paid from \$4.00 to \$6.00 a barrel for the eastern crop. We bought the Wisconsin berries generally at \$6.00 to \$6.25 per barrel. In 1905 we had a very short crop, only 225,000 barrels, and by the Wisconsin cranberry growers themselves getting together, under the guidance of the growers' good friend, Judge Gaynor, and selling to a group of buyers all in one bunch, they secured \$6.75 per barrel—probably the highest price on record for the whole crop up to that time. I bought eastern berries in the face of that small crop at around \$5.00 to \$6.00 a barrel. Now, this year, we anticipate the crop of the three states will run approximately 600,000 barrels. This is practically

double the size of the crops we had prior to the organization of the Sales Companies.

Even if other conditions were normal, I believe any of you growers will agree with me that a 600,000 barrel crop, based on all previous information we have had, would be very difficult to sell without a large growers organization stabilizing and regulating the distribution to suit the law of supply and demand. If we keep on growing it will be more and more necessary that all the good growers become members of the co-operative marketing organization and support it, both from a sales and advertising standpoint.

Bear in mind that Wisconsin only grows about 5 per cent of the crop of the United States and less than 7 per cent of the crop of the three principal states combined. About the same percentage of the berries are shipped from Cape Cod and from New Jersey through the Exchange as are shipped from Wisconsin today. This percentage is too small for the best results. We should have the distribution of not less than 90 per cent of the entire crop, whereas we only have about 65 per cent.

A. U. CHANEY,
General Manager.

OBSERVATIONS ON THE MARKETING OF THE 1919 CRANBERRY CROP

GEO. N. ARPIN

Members of the Wisconsin Cranberry Growers' Association, friends:

A paper on marketing might be a little book! But this is just a long-winded summary of my duties, experiences and observations as special representative of the American Cranberry Exchange for the marketing season just passed.

Inspecting and adjusting cars of rejected berries were my chief duties, and this work kept me pretty much on the jump in the territory between Saint Louis, Mo., and Winnipeg, Canada.

Another duty was the canvassing of the retail trade in the different cities visited, talking advertising and securing information about the cranberry trade. A report would be forwarded to headquarters based on the information gained.

Inspection work was a pleasant surprise to me, for whereas I had visualized the recipient of a punk car of berries as a gentleman in very ill humor, and probably giving vent to the same with very forceful expression, he was found, on the contrary, to be a pleasant fellow taking the adjustment of a complaint as all in the day's work. Of course, there were some little differences. and maybe a little dickering as to what was a fair allowance.

But the big surprise was to find that claims were never without some foundation, and usually, good foundation, at that. Very few claims were exaggerated.

The fruit-jobber rarely abuses the advantage a proper and legitimate claim gives, and I was surprised at the reasonable settlements arrived at. Very seldom does he reject a poor car of berries absolutely

and refuse to adjust or compromise, even if the market is weak. In fact, such a procedure is termed by the fruit-jobber "lying down."

Nearly every house visited expressly said that they were very glad a representative of the exchange was on the ground, so that there could be no chance of a misunderstanding.

The following is quoted from Mr. Chaney's instructions to me:

"While you must treat the buyer fairly, and impress him with the fact of your desire to be absolutely fair, always remember that you are representing the owner of the car who is not there to represent himself, and it is our job to see that the grower gets an absolutely square deal."

Probably the smooth sailing I had was due to the fact that Mr. Bissig had already paved the way, so to speak, and because I represented the Exchange. In the entire territory covered, the American Cranberry Exchange certainly enjoys an enviable reputation, and beyond question Eatmor berries are "in right" with the fruit-houses.

Questions asked the retail grocers were along the following lines:

How are berries selling?

Do you handle Eatmor berries?

Do you know about the Eatmor advertising campaign?

Wouldn't you like to have our recipe books and display matter?

At what price are berries selling?

How many pounds are purchased by the average customer at a time?

How about sugar?

While I have sugar at the foot of the list, the grocer invariably did not, and asked all about where that sugar was before I got well started with my questions.

The cranberry grower this year instead of a preface of, "If we only had had the water, or a decent growing season," will sing, "If there had only been more sugar!"

Considering the situation, the consumption of berries was remarkable. The grocers themselves were surprised. For this result, the advertising campaign, especially as carried on in the newspapers and magazines, must be given due credit.

Of course, the price of berries was low, too low from the growers' standpoint. The sugar situation together with the poor keeping quality of eastern fruit kept prices at a rock-bottom level.

At that, Eatmor berries sold at a premium on the Chicago market. Independent berries of like quality sold from fifty cents to a dollar a barrel less, and yet the Eatmors were more easily moved. It was a puzzling situation to the man on the other side of the fence.

It is remarkable what an advertising campaign extending over a period of years can do. The retail grocers not only knew about Eatmor advertising, but most of them handled the berries. To have the grocer consider Eatmor cranberries in the light of "Skookum" apples or "Sun-Kist" oranges is an end to be desired, and it is being attained. It was found that customers often specified Eatmors when ordering berries.

Speaking of advertising, it is recalled that many barrels examined contained no advertising matter at all, and when present it was usually at the bottom of the barrel. In canvassing the retail trade very little of this display matter was seen. It certainly was high class, but a stiffer poster of the same attractiveness that could be hung up instead of pasted or nailed would, to my notion, be more effective.

The little Eatmor signs on the sides of the barrels help a whole lot, but do they do all that they should? They are so often missing, torn or defaced, and in the store, more often than not, the barrel is turned the wrong way.

This past season the average customer purchased only a pound or two of berries at a time, usually a pound. A special effort was made to encourage an eight pound package, but neither retailer nor housewife responded with any great enthusiasm. Better results next season!

There were few complaints on Wisconsin berries this year. Early rejections of eastern lots were due to dented, water-soaked or scalded berries. Later in the season, end or side-rot was usually the trouble. Cape Cod and New Jersey cranberries certainly did not hold up.

There are some Wisconsin growers who do not appreciate the importance of a solid, tight pack. The minute a buyer finds a barrel that rattles he is suspicious. If the barrels open up a trifle off-grade, then slackness adds redoubled force to any complaint. If a lot is very slack, the barrels are opened and filled.

In Chicago one lot of berries came back to the house because the buyer thought the barrels "plugged." As a matter of fact, the lot had been slack and the berries had been tubbed—that is—poured out into baskets and then back into the barrels, a fairly tight pack resulting. It was evident that the original package had been opened, and the suspicious buyer drew his own conclusions.

Careless and poor sorting and grading were evident in some eastern packs. This is poor business for Eatmor berries at any time, and for the grower, too, especially on a slow, critical market.

Quite a few cars of eastern berries were branded the past season when they certainly should not have been. Of course, most of these soon came to light, and the growers concerned received little sympathy. Some of these shady packs probably "got by," but when they did Eatmor brand was in no way benefited.

We know that a product of dependable standard merit can rightly be pushed a long, long way. Surely Eatmor brand is in this class!

To one familiar with only the growing and harvesting of cranberries, this glimpse at the marketing side of the industry has been an interesting and pleasant experience.

TALK BY MR. BISSIG

MR. BISSIG: I did not prepare a paper, because everything has been said, so I thought I would tell you about the advertising and the Chicago market. Two weeks after the advertising campaign started we received letters from all over the United States from housewives, asking us to send these folders, and these are the folders, with cooking recipes. It tells you how to cook them, what to eat and everything. We sent out something like 30,000 of those booklets, and it has done a lot of good.

Speaking of the Chicago market. I arrived there about the first of September, and the first two cars arrived between the 8th and 10th, and they went out like hot cakes at the price of \$10 per barrel. They were Jersey berries and they took them as fast as we could unload them. We only let them have 15 or 20 barrels; they wanted 50. The first class went out, we expected them to come back; they did not. The retailers had them in store and they came back and they said, "We cannot sell them because we have no sugar." I am satisfied that we could sell as many more berries in Chicago as we did. The only way I can account for it is through the advertising campaign. I know buyers came in, I showed them the advertising, showed them how to cook, and I gave them the folders, and they came back, said, "That is fine; we use syrup, we do not need sugar." We advocate syrup for cooking cranberries and it resulted in fine sales.

As to price, we opened up in Chicago at \$10 for the first, then it went down to \$9. We got a premium for the first two cars, from then on we have been getting \$9 to \$10 a barrel for good stuff. At one station we sold from \$6 to \$8. In Chicago they dump all kinds of fruit. We had to compete with the independent jobbers. There is one man on the street sells 30 to 40 cars of berries and he sells them at any price he can get. He sold the same grades of berries that we were selling, and sold them for from \$8 to \$9, and we were getting from \$9 to \$9.50. They were shipped by consignment by independent eastern growers and we were up against it from the first day to the last. Now they have been cleaned up and now we have a better market. We have not many left, but we are getting independent. We are selling at \$10. We lay it altogether to advertising. Then in some instances the retail growers asked about double the price, 200 per cent profit.

On the North Side, where I am living, I pass some big stores every day, and they are selling cranberries for from 15 to 18 cents a pound, paying \$10 a barrel, they are making from 5 to 8 cents a pound profit. In some instances I saw they were selling at 20 cents. That, of course, curtails the demand. I told one of the men, "You are robbing the public." He said, "May be I do, may be I do not. I have got to get some money." After a while they came down to 12 cents, 15 cents, two for a quarter. That is the way it kept on all the year. Some places they have special sales, they sell at 10 cents; they

bought 5 and 10 barrels and they make a special sale, once every Saturday, 10 cents a pound. Of course they do not make big profit by that sale, but they sell big quantities of cranberries, that is how they make up.

They have not anything against the Wisconsin independent growers, I do not know of anything that was said down there, because we are mostly up against the eastern independent shippers, because there are not any Wisconsin berries in Chicago from independent growers. So I have not anything to say. I have not been out of the store in Chicago scarcely for two months. Even today we are selling from 100 barrels up at the store, which we never did before. The biggest sales we had in previous years was about 25 to 50 barrels a day, and now we are selling over 100 a day. There is a demand and then of course we treat the public right. We have two or three cranberry shipments coming every day, go at them and put them in as good condition as we can, sell them to dealers in Chicago. That is why we have the Chicago store, to get rid of the weak stuff. We had more weak stuff than ever before. It was practically nothing but weak stuff until now.

THE PRESIDENT: We have the Secretary of State with us, Mr. Merlín Hull, who will address us.

MR. MERLIN HULL: Mr. President, Ladies and Gentlemen of the convention: I am sure there is not very much that I can say to you that would be of very much interest to you people with your interest before you here, as you will be able to say yourselves.

Having been called upon for a few brief remarks, however, I will state in the first place that I am not an expert on cranberry growing. I know cranberry sauce is very good on turkey at Thanksgiving time, providing you can get the turkey. That is the principle part of my knowledge of cranberries. I sympathize with the expression of an after dinner speaker in which he did not like the idea of instructing people about something by somebody who does not know anything about it. I know newspaper men are frequently told how to run their newspapers, and a great many people are convinced that no editor really knows how to run his business. Some years ago I had a subscriber for my little paper at home, purely a county newspaper, but after he had been on it eight or ten years, I got a letter from him in which he stated he had been taking the paper ten years and he had read it with a great deal of interest at times, but he had noticed in all that ten year period I had never said anything about the Canada thistle, and he did not think any man who did not say anything in ten years about the Canada thistle could run a paper and he wanted it stopped.

I have been very much interested in your association, partly through Gebhardt Brothers, who every year for a number of years have reported to me personally what has transpired, and my little Jackson

county journal has had a great deal to say about the work of cranberry growers. It is a part of the great work carried on by the people of Wisconsin, that has made Wisconsin what it is today, more than a billion dollar state, a state that produces every year a billion dollars worth of commodities, in fact, production this year will exceed a billion and a quarter dollars. It is a wonderful record for two and one-half million people, and the work that you are doing is a part of that great work. You are pioneers in an important branch of horticulture; you are laying the ground work for cranberry growing, not only for the immediate future, but for the far distant future, when we will have a country far greater in population and where there will be a far greater demand for such luxuries as the cranberry is.

Wisconsin's progress can be measured to some extent by the manner in which people have been getting together, representing various combinations of people in years past. We have had our farmers' associations, dairymen's associations, and by getting together and getting knowledge from the experience of others we have been building up this wonderful progress and undoubtedly you people, although your association may not be as large as some other organizations in the state, unquestionably you are making progress from time to time, because you gather annually and listen to one another's ideas upon the important subjects relating to your occupation.

I sympathize with the idea expressed by one of your members when I was here a little while after dinner, that it is making the ideas public which makes them of importance, and while it is not always possible to have an agreement as to ideas, if all you people had exactly the same knowledge and same ideas and same experiences, there would be no use for an organization or getting together. It is only by working together that you work off new ideas and make better progress.

You know Mr. Bryan, some seven years ago—Mr. Bryan is not a member of my party, but I admire him for some things he has said, if not for all the things he has done—and when the campaign came on in 1912 and they were having a convention in Baltimore, and they were sitting for seven weeks, and somebody asked Mr. Bryan if he thought there was any hope for the democratic party, with the row that they had in their party. "Why," he said, "the outlook is brighter than it has ever been before, because after ten years of fighting, we have got so that we can lick anybody." So when you have differences in your conventions, it is rubbing up against each other and exchange of experiences in life that makes progress possible.

The years that we have gone through have been very harrowing to every individual. We have been under a high tension, and we have had a very strenuous experience. Now that those years are over we have been confronted by conditions which makes life only a little less strenuous. We have problems as great, possibly even greater, and this great prosperity which we have enjoyed and that you have shared in, is in the balance. We do not know what is com-

ing, because unrest among one class of people is likely to spread to others, and a long period of unrest makes for instability, which makes for the downfall of the progress which we are making and the great prosperity which is now in the country.

As members of your association you have those things which relate to you individually, to your vocation. As members of this organization you are also American citizens. It is well for us to remember the benefits which we receive from the governmental organization under which we are all doing business. It is well to recognize, too, that these benefits come to us as a blessing, and on the contrary, we owe the country and government something in the way of responsibility for the benefits we have received, and, my friends, at these times, when so many conflicting propositions are before us, so many weighty problems are bearing down upon us, it is necessary, of course, that we should remember that above all, we should do our duty, to our God and to our country, no matter what your vocation is, one way or the other, we ought to understand our responsibility, as far as we, as individual citizens and associations are concerned, we are going to recognize at all times the duties which devolve upon us and fulfill them to the greatest extent possible. I thank you.

WAREHOUSES—NECESSARY QUALITIES AND PROTECTIVE ARRANGEMENTS

CHARLES L. LEWIS, JR., Beaver Brook

I think this subject ought to be treated in the light of a discussion, rather than a paper, because when you read about the construction of a warehouse, unless a person is engaged in that at the time, I do not think you remember very much about it. I will tell you, though, what we have done this last summer and if you should have any similar questions, or similar situations among yourselves, any one of you, why, you can possibly apply some of the things that we have done, or you can bring up the question and we can all discuss it.

We faced the situation of having to provide greater storage facilities this last year. We had nothing but temporary shacks, so we investigated the warehouses in the country and analyzed our needs and made very careful plans and carried them out as best we could. Some of the things we took into consideration were the sizes of the crops which we were to handle, the location of our dock with respect to the railroads, the country in general, especially regarding the climate.

You know we are located up in the northern part of the state, where I think our thermometer goes down to about 20 or 30 degrees on an average lower than it does in the southern part in cold weather, and if we intend to store cranberries for the Christmas trade, or winter trade, we have got to be very well protected.

Another thing is the class of materials that a person is going to use, and the method of construction, whether by contract or by day labor. We went over this situation rather carefully and were guided principally by Mr. Searls' warehouse. We found that he had a very fine building that he was using to the best advantage. It was a steel lath construction, with stucco finish, three floors, with an elevator provided to carry the berries in cold weather. We found, however, that steel construction and back plastering, that is, plastering on the inside of the building, the expense of that kind of construction had gone up so much recently, due to the high cost of steel and labor, that we thought possibly we could find a substitute that would answer our purpose, and in talking to Mr. Gebhardt here, of Black River Falls, who has built a warehouse in the last year or two, we discovered that there was a concrete block that he had made himself, that provided a cold air space around the building that he had used and thought a great deal of. So we looked that up and it looked very good.

We bought a cement block machine and a concrete mixer and we had very good sand on the ground, so we started to work to make our own blocks. We made on the average 200 blocks a day, and we made about 10 or 11 blocks from one sack of cement. Our building was 40 feet wide, 70 feet long and 18 feet post, that is, 18 feet high at the side, gable ends were blocked up; we required about 5,000 of these blocks.

We started building, making these blocks, on the 8th day of July. We were late in getting started, and we put our first berries into the warehouse on the 8th day of September. But we had to hustle. We hired three masons to lay the blocks; we had three very good men and one very good carpenter to supervise the laying of the floors and the roof, framing the roof, etc., and it was all done by day labor.

We built a basement 20 by 40 feet under one end, 9 feet deep, and our first floor over the basement put on a wooden floor, double hardwood floor, that is the first floor was furred, ship-lapped, second floor, the balance of the floor was to be of concrete, now simply dirt. The second floor, the lining was fir, and the double floor, interior, maple; the third floor simply ship-lap.

Our roofing is matched six-inch flooring, Idaho white fir, which is a good grade of Western lumber, and we put on the very best grade of galvanized roofing three-ply. It is a self-supporting roof, no posts, which gives a very fine building. We built this building for a little over \$5,000 and I think we did pretty well. We equipped the storing room with moving tables. We have a grader and rolling table with canvas moving belts which are in turn hooked to a conveyor and the berries are in the room only a short time. The hoppers open onto the second floor. We use trucks to carry berries to the hopper. We have an elevator to lift from the basement to the third floor, and we put the berries on the trucks, wheel them to the elevator, take the trucks up to the second floor if need be and empty them right in

the hoppers. We are not at present equipped with two complete outfits, but we have one outfit going, and, an equipment where we will have two mills, two sets of tables, one conveyor, and the berries are conveyed out into the packing room adjacent to the storeroom, where they go immediately into the barrel and are headed up.

I have been around to visit a great many of the warehouses in the state. I visited some in the East, and simply used the best ideas that we have found used by the other growers, and there are possibly one or two original features that we put in ourselves. We are fortunate in having a spur track of our own, so that we can load directly into the car out of our own warehouse. The first floor of our warehouse is on the level of the car floor, probably two inches higher. This year we have kept berries in this warehouse up to the present time; we still have some there. We experienced in December weather 35 degrees below zero, and a good many days 20 to 30 below. When it got down to 18 to 20 below we really thought it was warming up, but with a little additional heat we have suffered no trouble protecting the berries from the frost, and the berries are keeping splendidly. We tried the use of oil stoves spoken of this morning. We bought six oil stoves and used them, but they are not satisfactory and I would not recommend them to anybody, that is, from our experience.

Our building is very tight, we are very careful to get it tight round the windows. We built one house two or three years ago, and I think we were not very careful to get it tight around the windows, and it was rather a good lesson to us, because when we built this warehouse we were extremely careful to get the windows tight. It is very easy to get a crack between the frame and the blocks when the blocks are put up and if the masons are warned and carefully instructed, it is very easy for them in putting up the blocks, to fill in the space with cement, and very important that a strip be put on the outside of the window frame, two inches square and spiked to the frame so that it overlaps on that block, so that there is no chance for any air to get clear through. That preserves and gives us the benefit of air space around the building.

Perhaps I had better explain about the air space in this block. The block consists of two complete walls, joined by four galvanized iron staybolts. This gives us a double walled building with a dead air space complete up and down and around the corner and extending around the entire distance. This dead air space acts as an insulator, and frost that will go through the first wall of the block cannot penetrate the air space and get inside.

It certainly is important at this day to put in every single device you can to save time and to save labor. Labor costs more than twice as much as it used to and we have got to cut corners every chance we can get. We now can pack a car of berries in one day and pack them in good shape with our equipment and with the minimum amount of help. The only ventilation we have is our windows.

We have a number of windows; I think we have 35 windows in the warehouse. We do not store on the third floor, simply in the basement. On the third and second floors we have double windows. That is very important in cold weather, and we keep those windows open all the time until it gets below freezing, and even then if we can, when it warms up we open up the windows and doors and let the air go through, get a change of air even in cold weather.

We have a door on the first floor, at the end of the building, so that we can drive in with a load of berries and unload right from the rack. That is, we can drive in with the load as we come from the bog, unload on the first floor. We also have an outside door on the second floor, and an earthen embankment, so that we can drive up this earthen embankment and put our berries on the second floor. Put them from the wagon on the trucks and roll them away. In that way we can store away our entire crop without lifting a box and without using the elevator at all. I do not think there is any other ventilation necessary than what we have with the windows.

I talked to some few experts on ventilation before we built and I was told that unless we put in a complete system of ventilation we had better not put in anything, that our windows would answer our needs. If we put in a very complete system of ventilation, it would be very expensive and we think that we are pretty well equipped now, and we are going to make a success, I hope.

TIP WORM—WHAT WE KNOW OF IT AND WHAT WE SHOULD KNOW

O. G. MALDE, Tomah.

Tip worms were first observed eight or nine years ago, working in a small way on the tips of cranberry vines, and quite a bit on some of the weeds. That is one thing about the insect, it has a host on some weeds. It is not going to be the easiest insect to combat when the time comes that we have to fight it tooth and nail.

The cranberry tip worm, to a great extent, is a misnomer; it is not a worm, it is a sort of grub, or maggot. It has no feet, it has no mouth parts, it has a sort of hard shell up on the front part of the body, which it uses in chafing the foliage where the egg is hatched, and in doing that chafing, it eats the leaves, or that which is chafed off, that is the way it lives.

The eastern insect known as the tip worm is actually a worm. It is a worm that crawls up the vines, as I understand it, and it actually bites into the tips and bites them off and the tip drops down, a certain part of it; it goes down and feeds on a part of the tip, picking it off the ground. I noticed in the last publication of the Horticultural Station it does not cover the tip worm that we have at all; it evidently only covers insects that are found in the East, as in-

jurious to cranberries. But this tip worm that we have here, which I say is a misnomer and which we ought to call the tip maggot in order not to have it confused, the eggs are laid by a minute fly. You know what a fruit fly is on bananas and grapes, they have a spread of wings only $\frac{1}{8}$ inch or less, and these flies deposit the eggs on the tip leaves of the cranberry vine, and these eggs in eight or ten days, in normal weather, will hatch this grub, which feeds, as I have mentioned, by the chafing of the leaf.

This chafing of the leaf is done on the upper side, the larva, having no legs, has to stay on the upper side, so the eggs are deposited on the upper side of the leaf, and with the chafing of the leaf the leaf gradually shrinks up and you get the mottled leaf, and they curl up like a frosted cranberry leaf would, and the insect works in this way until it is fully grown, spins up a little silken web, remaining inside between the leaf and the web for a period of four or five days or so, going through its metamorphosis, then hatching into the fly again, which proceeds through the same circuit and the same life cycle.

The actual length of time of each part of the cycle is not actually understood, although it is so near some of the other insects that we are reasonably sure of the approximate length of time. After the fly emerges from this pupa that was in this cocoon, that flies around some seven or eight days or a week, not over ten days, and in the course of time deposits another egg and the same process is continued, and the question in our minds is, exactly how many broods there are a season. We know positively there are two, and most likely there are three broods.

This same insect feeds on weeds around marshes, but chiefly on what we call loose strife, a ragged looking weed that grows 13 to 14 inches high. It has a long scientific name, *Lysimachia terrestris*. As a matter-of-fact, we have found more of the insects in that weed in a condition that we could study than we have on the cranberries. That was in the early days, but in recent years there has been more of this tip worm showing up and working on the cranberry bogs all over the state, you might say, especially in the two main cranberry districts, and it has really appeared to what you would call an alarming extent.

Now, the early work of this insect is not so detrimental; although it spoils the tip, it does that work before the actual bud has started setting. Our records show that usually the early work of the maggot is about the end of the first week in June, that is when we first find it working, and then in the course of its few days of working, ten days or so, and then the hatching and the like, why, the fly is again flying the last week in June. Then you have a chance for a full life cycle in July. We are not sure whether it is a distinct cycle, or whether it dribbles along and comes along at different stages, which is true of some of the insects. But we find that ordinarily about the middle of August there is a brood at work, and it does not seem to be working altogether, you will find different stages

within a period of a couple of weeks. We have a number of records around the 16th of August, when the maggot is again at work. When the maggot is working extensively at this time of the year it is going to injure our fruit bud that has already started and spoil that, and the season is so far advanced that any bud that is started at the side of the tip that is injured is coming along so late that it cannot mature.

Of course, if the time comes that we have to combat this insect very radically, why, it is a problem of getting at it in June, and you will notice the first week in June when it is on there, it is about the time when the berries are in the making, and it is going to be hard to get at it then if you are going to do it when feeding, but it is possible that spraying may be successful. But we have not known the insect well enough to realize the danger of its attack. I am just calling your attention to this part of the life history that we know, and some of the observations that we took after Mr. Hardenberg wrote his bulletin on the cranberry insect, Bulletin of 1909. He says nothing about the treatment.

One stage of the insect that we do not know is its winter carrying over. We know the eggs are deposited on the tip and that they hatch, the maggot working on the tip, but we do not know whether the eggs are deposited in the fall and carried there through the winter, or if the fly hides away under some bark or somewhere and actually flies again in the spring. You see that it is such a minute fly that it would take very long and patient watching to actually discover it. About the only successful way would be to have a large number gathered up late in the season and cooped up on a small area of a small bog and try there to determine whether or not the fly itself dies off in the fall. If it does, then we will know that the eggs are deposited on the limb, because it is very evident, if the insect has not the habit of depositing the eggs the same as the blackhead miller does, that is, the insect itself hibernates and comes out again in the spring. The blackhead deposits the eggs on the leaves and vine and the eggs survive, the more we protect the vines the better we protect the eggs of the yellow head. On the other hand the insect itself is the miller, goes and hides away under some piece of bark, some foreign matter that is pretty well protected.

That is one stage of this peculiar worm that we do not know is its wintering over. This matter of the tip worm was spoken of last summer in this organization. Try next fall to get more appropriations from the legislature to further the work along insect investigation in Wisconsin. These are some of the things that we have to bear in mind, along with some other prominent things; getting after the tip worm, because there are evidences that the tip worm at present is actually making quite a heavy inroad on our crops, especially in the Cranmoor district.

The general appearance is rather a metal color, the color of metal, a sort of uniform gray, the head part and the shoulder part, or the

part the wings are on. The main thorax is a glassy part, while the female is an insect with a black head and eyes, a sort of a yellow side body. The one that gives you the most metallic appearance, is the male with the shiny wings, transparent wings, the wings covered with this almost like talcum powder, you might say.

It seems to me the only quick remedy, if it is bad, if it is to be found working in June, is to spray, because it is working at the time when the blossoms are almost opening, the first week in June, you are apt to have the hooks pretty well out and you cannot flood. It is an insect that cannot crawl away from you, if it appears at a time when you can actually flood, but it will take at least two days to flood, and a two-day flood at that time might be detrimental. The average cranberry man would have to use his own judgment. A very thorough spraying when it is badly infested might be quite effective, because of the nature of the insect. If we can catch it when it is first working, the leaves have been curled up and to protect with sufficient spray is apt to get pretty close to it, but of course by only doing that chafing, the spray that will have to be used is what you would call a contact spray. A contact spray is what you call Black Leaf 40, or nicotine, or kerosene emulsion, that would kill by contact, because it would be hard to get the poison to it, unless you get so much on the body that it might absorb enough of the poison to kill it.

DISCUSSION

MR. CASE: I burned off five acres. Every tip is gone by the tip worm. After I burned it off it made a nice growth, but there is not a tip left.

MR. MALDE: You made that early in the spring. You have a growth that undoubtedly should have some fruiting buds on it for another year.

MR. CASE: The vines are small; they made an excellent growth, they had buds on, but the tips were taken.

MR. MALDE: It is my opinion that where it was badly infested and you should find the fruit budding on that piece was not very good, it might be better to sacrifice the crop for another year and put water on it about the middle of June, about the time you see some work.

I should have added to that discussion of the insect work, that after this insect is through working, and just about the time it spins up its silken cocoon, that these leaves are drying up and shriveling and are pretty small, and this insect on the dry leaf will dry so that you lose them. Mr. Barber has been talking about the grasshopper that bit off a lot of tips last fall, he took me out to show me what the trouble was, and I saw immediately that what he had reference to was this tip worm that hatched on the old tips where the leaves were still there; you can always find that little white, slender web on those little tip leaves. Sometimes the leaves have broken up and it will not look much bigger than a long pin, only about one-eighth inch long. As to the flying habit, I do not know that there is any particular time that it has a hovering flight. I noticed most of them were flying when we were walking through a badly infested field.

MINUTES OF THE THIRTY-THIRD ANNUAL MEETING

The thirty-third annual meeting of the Wisconsin State Cranberry Growers' Association was held in the senate chamber of the capitol at Madison, Wis., January 9, 1920. The program so ably arranged by Mrs. Whittlesey, the secretary of the association, was carried out.

Owing to the illness of Mrs. Whittlesey, Miss Huyck of Minong was appointed secretary for the day. With the provision of a skilled stenographer accurate records were made of all speeches and discussions.

The election of officers followed the program proceeding in the regular way with the following results.

Mr. Andrew Searls, Grand Rapids, Wis., President.

Mr. F. R. Barber, Warrens, Wis., Vice President.

Mrs. S. N. Whittlesey, Cranmoor, Wis., Secretary.

Mr. M. O. Potter, Grand Rapids, Member of Executive Committee.

A treasurer could not be elected as the state now holds all funds and bills hereafter will be paid by the state treasurer.

The minutes of the August 12th summer meeting were read and approved.

The reports of secretary and treasurer were read and approved.

President Searls appointed M. O. Potter, F. R. Barber, and Guy Nash a committee to audit the bills, which were found correct and approved.

The secretary was instructed to send letters of appreciation to Mr. F. J. Wood, of Grand Rapids, for his splendid entertainment of the growers attending the convention on Thursday evening, and to the governor and secretary of state for their addresses.

A motion was made and carried that the president appoint a committee to revise the premium list with a view towards eliminating private brands on well-known and named varieties and bringing before the public the best varieties with a proved commercial value.

The following committee was named.

Mr. M. O. Potter, Mr. F. R. Barber, Mr. O. G. Malde.

The meeting adjourned at 6:15 p. m.

LYDA M. HUYCK,

Secretary Pro Tem.

40 WISCONSIN CRANBERRY GROWERS' ASSOCIATION

TREASURER'S REPORT

WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION

| 1919 | | Receipts | Disbursements |
|---------|---|-----------------|-----------------|
| | Balance on hand Jan. 14, 1919..... | \$ 94.18 | |
| July 2 | Received from Secretary fees and arrears collected from Jan. 1 to July 1, 1919..... | 56.75 | |
| | | <u>\$150.93</u> | |
| June 28 | Clara S. Smith, reporting services..... | | \$ 3.00 |
| Aug. 4 | C. M. Secker, expenses as delegate to Madison. | | 20.04 |
| Aug. 4 | Nick Wirtz, hauling sand, pump and pipes.... | | 6.00 |
| Aug. 6 | Grand Rapids Tribune, printing invitations... | | 1.75 |
| Aug. 9 | Mrs. S. N. Whittlesey, cash advanced for telephone, telegraph, express, etc..... | | 4.22 |
| Aug. 15 | Remitted to Secretary, the balance in the treasury to be placed to the association credit with the state treasurer..... | | <u>115.92</u> |
| | | | <u>\$150.93</u> |

HERMAN J. GEBHARDT,

Treasurer.

SECRETARY'S REPORT

FINANCIAL STATEMENT OF THE WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION FOR THE CALENDAR YEAR 1919

| 1919 | | Receipts | Disbursements |
|---------|---|-----------------|-----------------|
| | Balance on hand Jan. 1, 1919..... | \$245.48 | |
| July 1 | Appropriation by legislature..... | 250.00 | |
| Sept. 2 | Balance of association funds forwarded by the Secretary as by state requirements..... | 115.92 | |
| Nov. 3 | Collections | 3.00 | |
| | Total..... | <u>\$614.40</u> | |
| Feb. 17 | I. C. Schlig, reporting services..... | | \$ 5.00 |
| | Mrs. S. N. Whittlesey, salary July 1, 1918, to Jan. 1, 1919..... | | 40.00 |
| | Postage, etc., as per statement rendered..... | | 13.58 |
| Mar. 11 | Grand Rapids Tribune, printing..... | | 10.37 |
| July 11 | Mrs. S. N. Whittlesey, salary Jan. 1, to July 1, 1919 | | 40.00 |
| | Postage and supplies..... | | 10.94 |
| | Anna M. Bamberg, services..... | | 2.50 |
| Aug. 1 | B. R. Mitchell cash advanced on pump ex... Printing board, printing etc..... | | 97.48 |
| Nov. 3 | Wisconsin Cranberry Sales Co., 1/2 share of state fair exhibit..... | | 35.01 |
| | | | <u>125.00</u> |
| | Total..... | | <u>\$379.88</u> |
| | Balance on hand Jan. 1, 1920..... | | <u>234.52</u> |
| | | | <u>\$614.40</u> |

Respectfully submitted,

MRS S. N. WHITTLESEY,

Secretary.

Memorial

The Wisconsin State Cranberry Growers' Association wishes to give appropriate expression through their committee duly appointed, of its appreciation of the membership, and services, and advice given in the life time of Mr. A. C. Bennett and Mr. D. R. Burr, now deceased, and to pay fitting tribute to their memory.

Mr. Bennett was among the most prominent and most honored and useful members of this association from its very beginning, and only ceased active work when health failed.

Mr. Burr also from its earliest history was one of its most interested, alert and faithful members. The occurrence of the death of these members reminds us of the uncertainty of life's tenure and the absolute certainty of the worth of beneficent service rendered to mankind.

WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION,

By its President, Andrew Searls,

By its Secretary, Mrs. S. N. Whittlesey.

By its Committee:

S. N. Whittlesey, M. O. Potter, G. W. Paulus.

MINUTES OF THE THIRTY-SECOND SUMMER MEETING

The cranberry growers of the Wisconsin State Association held their thirty-second annual summer meeting as per schedule at the Grand Rapids street car pavilion near Nekoosa on Tuesday, August 12, 1919.

The weather conditions were fine, enabling those coming from a distance in autos to make the long drives in comparative comfort and ease.

The great size of the assembly room made our gathering seem small, but by actual count there were more than one hundred in attendance. The meeting differed somewhat from those of years before in having a musical innovation that was a happy feature. The charming manner and sweet voice of Mrs. F. R. Barber, of Warrens, Wis., ably supported by her son as accompanist, and the violin solo of the son with the mother at the piano, were noteworthy attractions. Added to these the unison of voices of all present in familiar songs of the day led by Mrs. Barber, made a pleasing respite in the afternoon's program.

Disappointment over the nonappearance of Prof. Whitson and Secretary Cranefield was very great.

Prof. Whitson was detained by an unexpected visit from his aged father, and Secretary Cranefield by misinformation regarding trains, making continuation of his trip from Portage impossible for date set.

Besides the prepared papers, topics suggested in President Searls'

address were discussed, the unusually full account of which found in the report is largely due to the work of Miss Scott of Warrens, Wis., in taking stenographic notes and furnishing transcript. The association members gratefully appreciate and tender thanks to Miss Scott for the kindly and efficient service rendered, which preserves in record form much that would otherwise have been lost.

MRS S. N. WHITTLESEY,

Secretary.

PRESIDENT'S ADDRESS

ANDREW SEARLS

Ladies and Gentlemen: I hope you have spent a profitable morning in visiting the different cranberry bogs, and have come here prepared to take an active part in any discussion that may come up. I think we do not visit our neighbors' bogs as often as we should. If some one grower has a particularly fine crop, many will wish to view it, but if a grower has made a slip somewhere along the line we are pretty apt to say, well, nothing there to see, overlooking the fact that we may learn from the mistakes of others and thereby avoid making the same mistake ourselves. Of course I hope none of you have made mistakes and that all have a beautiful crop of berries growing on your vines.

I understand the blackhead fire worm has done considerable damage in some parts of the state. I think some discussion on this subject should take place today. I had supposed this pest and how to handle him was well understood. I think it was some twelve years ago I had a visit from this worm. Our dams were high enough to put on a good flood but we had much big grass up which some worms climbed, but we discovered that a good flood would kill most of the first brood of the season, which usually appears in May. We found thirty-six hours of submersion was sufficient to drown the worm. If the first brood is neglected, the second brood, which appears usually in July, cannot be reached with water without doing the vines and berries great harm. I understand the tip worm has been very active. We really know little regarding this pest. We had a man here from Washington, D. C., some years ago working on this subject. I think our secretary should ask for information what was learned by this investigation. Personally I have suffered little I think from this pest. He is with us but does not seem able to do us harm. We keep our vines strong and vigorous by careful handling and sanding, and our vines put on a fruit bud after the worm has done his work. I think this is a case for home treatment.

We have been needing funds to make experiments. We should have some well defined plan of action laid out, that if a committee should be sent down to Madison to urge the appropriation of funds

for this purpose, a reasonable plea could be put up that we had a sound plan of action in mind.

We know we have frequent lack of water, also a lack of sand, although large amounts of both are only a short distance below the surface of the ground, but how to make them available to the grower is a very big question.

One of the original objects of the August meeting was first, to fix prices to be paid pickers and rakers in the coming harvest of cranberries—gather information of the probable yield, east as well as west, and fix as far as possible the price at which they should be sold.

In the past we have found some difficulty in holding growers to these estimates and agreements. Labor is mighty well organized. Price of labor is very high. Some of the growers are asking for an agreement fixing a price for rakers and to ask growers to stand by such agreements.

Little picking is done today, usually on ground that cannot be raked to advantage. I do not think it worth while to discuss the picking prices, but I do wish to have discussed and a reasonable price fixed to be paid rakers.

NEWS FROM NEW JERSEY

Mrs. S. N. Whittlesey,

Secretary Wisconsin Cranberry Growers' Association,
Cranmoor, Wisconsin.

My Dear Mrs. Whittlesey: I am sure that you have the crop reports, which tell you much more of the prospects than I can do. As far as I myself am concerned, I hope to have a good crop. From what I hear from my sales agent, the bloom on most bogs in our section has been very heavy, but there was some damage from the continued rains, as we had nine days in succession, beginning with St. Swithin's Day. Those bogs where the bloom was late will be injured, as some of them were covered entirely, when the owners did not have control of the water. My own berries were about the size of peas when the rain commenced, and as my ditches were in good shape, no harm was done. I hear that the whole crop promises to be larger than last year in all sections.

I am trying the experiment of bees this year, but do not know whether I can tell whether there is any result in the crop returns or not.

I wish that someone would take up the matter of algae growth and work out some remedy. I have gotten no satisfaction so far from the Department of Agriculture.

We have had a great many grasshoppers this year, but by virtue of spraying and dosing them with bran and Paris green we hope that we have the best of them. Very truly yours,

K. C. Rockwood.

Princeton, N. J., Aug. 5, 1919.

NEWS FROM ILWACO, WASH.

HENRY S. GANE

Growing cranberries in this state is somewhat of an experiment, but we believe that they will do well here from the fact that a few small bogs have done so.

The surprising thing to me is the fact that some plantings seem to do so well early and other plantings are so slow.

A company of which I am the head, has seventeen acres and it has been very slow coming into bearing. On the other hand, I planted three acres for my wife and children and this fall when it is only two years old, we will get about 120 barrels of cranberries of the McFarlin variety. The bogs in this state are all sanded and under a high degree of cultivation. The most troublesome feature that we have to contend with is that of weeds. There seems to be 50 or 100 different varieties and they most certainly grow at a great rate. The only way they can be handled is by constant weeding when the bog is very young. If the weeds once get a good start it is impossible to check them. Our crop here is smaller than anticipated but we are pleased to learn that the crops in all the eastern states are very fine this year.

FALSE BLOSSOM IN CRANBERRY INSPECTION RECORDS

S. B. FRACKER

One of the causes of serious loss in cranberry production is the condition known as false blossom. Whether this develops as a result of infection or is due to injuries or improper cultural conditions is unknown. There is little evidence to show that it is an infectious disease and efforts to find an organism responsible for the damage have been unsuccessful.

The nursery inspection office of the state department of agriculture was requested in 1915 to consider cranberry vines for propagation, as nursery stock and provide for their inspection. Claims had previously been made in certain quarters that false blossom infection areas had started as a result of the introduction of Wisconsin vines and while it developed later that this condition had been present for years in such areas the cranberry growers desired to protect themselves against further criticism and their customers against possible loss.

False blossom, as indicated by the name, is the development of what appears to be a blossom followed by a green shoot instead of a berry. It is believed to be distinguished from lack of pollination by the fact that the pedicel of the flower remains erect instead of bending over, as all normal blossoms do at the time the "fruit sets."

As a result of cranberry inspection it has been found necessary to refuse permits for the sale of plants from an average of 54 acres per year out of 252 inspected, or about 20 per cent. The records

of this work offer an interesting study especially in regard to the variety of plants affected.

The accompanying table shows the acreage of each variety examined and the per cent of that acreage condemned as nursery plantings on account of false blossom.

Two extremes of susceptibility are apparent. The native Wisconsin varieties, "Bell and Cherry" and "Metallic Bell" are so uniformly victims of this condition that the source of plants of these varieties has become greatly reduced. In fact the situation is shown too conservatively in the table; for large acreages in which false blossom was found in 1915 have been withdrawn from inspection and no plants have since been sold from these bogs. Less than half an acre of "Metallic Bell" a year, 6 per cent of the inspected area of this variety, has been licensed for sale. The 44 per cent of the "Bell and Cherry" acreage shown represents less than ten per cent of the bogs from which "Bell and Cherry" might be sold were it not for false blossom.

At the other extreme are the more vigorous growers, "McFarlin," "Searls Jumbo" and "Prolific" with practically clear records. "Bennett Jumbo" seems to be comparatively resistant while the acreages of "Potter's Favorite," "Early Ohio" and other varieties examined have been too small to show positive results.

Mr. O. G. Malde, who has made all the cranberry inspections for the department, believes that this varietal susceptibility is in part due to the different cultural conditions under which different varieties have been grown in the past. Whether a false blossom "habit" could be developed and inherited under such circumstances is perhaps questionable but the fact that cultural conditions modify the severity of the attack is clear. Wet conditions seem to be favorable to the disease while the policy of a dryer bog makes the plants more resistant. Sanding and commercial fertilizer have also resulted in a marked improvement.

From the nursery inspection standpoint false blossom must be considered the same as an infectious disease. While plants transferred from an infected bed to a new one operated under better conditions show a marked improvement in crop returns, they still continue to develop false blossom. It is also true that once introduced into a bog, the loss usually becomes worse from year to year until the bog is abandoned.

If any conclusions can be drawn from our present knowledge of this so-called disease they are:

1. Resistant varieties of strong vigorous growth should be chosen for new plantings.
2. Cultural conditions which result in the largest return in a healthy bog are also the best ones for assisting an infected one to overcome the false blossom condition.

TABLE SHOWING FALSE BLOSSOM ACREAGE

| Varieties listed in order of total acreage inspected | Average acreage inspected annually | Average acreage infected annually | Percent diseased | Total number inspections made '15-19 | Number owners of infected plants |
|--|---|--|---------------------|--|---|
| Searls Jumbo | 79 | 0. | 0 | 18 | 6 |
| Bell and Cherry | 60 | 34. | 56 | 17 | 8 |
| Bennett Jumbo | 50 | 11. | 22 | 16 | 8 |
| McFarlin | 37 | 0.2 | 1 | 14 | 1 |
| Prolific | 7 | 0.4 | 6 | 16 | 1 |
| Early Ohio | 7 | 1.4 | 20 | 4 | 2 |
| Metallic Bell | 6 | 5.6 | 93 | 14 | 12 |
| Others and mixed | 6 | 1.6 | 27 | 16 | 5 |
| Total | 252 | 54.2 | 21 | | |

PAPER BY PROF. A. R. WHITSON

The work I did in cooperation with the Wisconsin Cranberry Growers a number of years ago was one of the most enjoyable pieces of work I have ever undertaken, and to me at least, was very profitable. Since I have not been engaged for a number of years in the work immediately related to cranberry culture, I can say little at this time which would be of practical value to cranberry men, and in place of taking a number of words to say that little, I am going to outline a suggestion which it seems to me might be of considerable help in the development of the cranberry business, namely the holding of a short school for cranberry growers each year either at the College of Agriculture at Madison, or at some other suitable place.

In order to make the object and possibilities of such a school clear, will you permit me to outline very briefly the history of the work which the Agricultural College has attempted to do for the cranberry industry.

My attention was first called to the requests which cranberry growers had made for assistance by Professor Henry, formerly Dean of the College of Agriculture. At his request in 1902 we transferred a small fund which the federal government had set aside for experimental work in irrigation to a study of the uses of water in connection with the cranberry industry. The legislature of 1902 and 1903 made the first state appropriation of \$2,500 a year for two years in addition to the federal fund, and work was begun in the summer of '03.

It was recognized at once that the problems involved would require assistance from the Department of Horticulture as well as of Soils, and Professor Sandsten, formerly Horticulturist of the Station was associated with me during the first few years of this work. Professor Sandsten undertook as his part of the work, a study of the varieties of cranberries, of the insect enemies and the means for their control, and of the fungus diseases to which the cranberry plant is subject. Since that time the work then included in the Department of Horticulture at the College has been very much

differentiated. A department of Entomology for the study of insects affecting agricultural production, and a department of plant pathology for the study of fungus diseases have been organized separately from the department of Horticulture. This department has been able to devote a larger portion of its time and energy to the study of varieties of agricultural crops, and methods for their propagation.

Every one who has had any experience with cranberries realizes that in each of these three fields there are very important problems remaining to be solved, the solution of which is possible only through the work of men who are able to specialize along these separate lines.

The problems undertaken by the Soils Department, then called the department of Agricultural Physics included a study of the effects of sanding and drainage on the formation of frost, the possibility of making more accurate predictions of frosts, and on the use of fertilizers for increasing the crop yields.

It was soon learned that on a well sanded and drained marsh the temperature of the soil rises considerably higher during the day and is much less liable to frosts during the night than on an unsanded and wet marsh. The sand, being relatively dry, does not lose its heat through the evaporation of water as a wet marsh does, and it has a higher heat conductivity; so that the heat penetrates more deeply. Moreover it acts as a mulch lessening the upward capillary movement of water which would otherwise reach the surface and be evaporated causing the continual loss of heat.

A full understanding of these principles enables the grower to manage his marsh with much less water than is otherwise necessary to protect from frosts.

Through the cooperation of the state and federal weather bureaus a more efficient system of weather prediction was worked out. A considerable amount of information in regard to the relation between frosts on cranberry marshes and the general weather conditions prevailing was acquired.

One of the problems in which I was personally very much interested was the use of fertilizers for increasing the yield of cranberries. Some study was given the problem, but I believe there is still a large field for further investigation. It has been clearly shown that a cranberry plant requires but small amounts of lime, and in fact grows best on an acid soil in which its sap probably has a higher degree of acidity.

In several cases it appeared that nitrogen fertilizers were beneficial. In most of our early work the nitrogen was added in the form of nitrate. Since nitrates do not develop readily in marsh soils, naturally most plants which in the process of their evolution have adapted themselves to marsh soils use their nitrogen in the form of ammonium salts. It is therefore quite probable that better results in the fertilization of cranberries would be secured through the use of nitrogen in the form of ammonium than in nitrates.

It is practically always true that crops growing on marsh land, especially on acid marshes require both potassium and phosphorus to permit them to make the largest growth. It is highly probable that larger yields of cranberries than have usually been secured can be grown through the use of a fertilizer in which the right amounts of nitrogen, potassium, and phosphorus are properly balanced. To determine the correct formula for this fertilizer will, however, require considerable additional work, although investigations by the New Jersey Experiment Station have added very materially to our knowledge of this matter.

Not only will the use of fertilizers increase yields, but the more vigorous growth of the cranberry vine which it encourages will render it distinctly less liable to diseases, especially fungus diseases to which it is subject.

I have outlined these various phases of the relation of agricultural science to cranberry growing in order to make it clear that any assistance which the Experiment Station can render cranberry growers must be along special lines, and that the cranberry growers themselves must put together the help given by the different specialists in working out the best practices in cranberry growing.

Now for the suggestion in regard to the cranberry school. Such a school extending over one or two weeks, and taking most of the time of those attending the school would make it possible to have specialists along several lines give several talks and demonstrations. At least five or six separate hour periods should be given to each of several subjects including the varieties of cranberries; insect enemies, fungus diseases; principles on which the use of fertilizers are based, and the physics underlying soil management with reference to temperature control. The program should also include round table discussions of the general management of cranberry marshes, and methods of marketing the crop.

The Agricultural College would seem to be the proper place for holding such a school on account of the facilities there, including classrooms, libraries, and other features, and not least among these would be the opportunities offered for the cranberry growers to meet people from other sections of the state who are studying other phases of agriculture. Such a school should be arranged for sometime during the winter when the cranberry grower and the members of his family can most conveniently attend.

I hope this suggestion will be considered by the Association, and I shall be very glad to assist in any way possible in developing the plan should it meet with approval.

WISCONSIN STATE CRANBERRY GROWERS' ASSOCIATION

An organization having for its object: Improved quality of fruit, better grading, packing, and extension of market; increased consumption by making known the wholesome and medicinal virtue and value of the cranberry; better methods of cultivation, and the collection and publication of statistical and other information of interest and worth to all concerned.

January, 1920, report, now ready for distribution, will be sent to all entitled to same on application to Mrs. S. N. Whittlesey, Secretary, W. S. C. G. A., Cranmoor, Wood County, Wisconsin.

ASSOCIATION OFFICERS

President, Andrew Searls, Grand Rapids, Wis., Rt. No. 3.

Vice President, F. R. Barber, Warrens, Wis.

Secretary, Mrs. S. N. Whittlesey, Cranmoor, Wis.

Treasurer, H. J. Gebhardt, Black River Falls, Wis.

Member Executive Committee, M. O. Potter, Grand Rapids, Wis.