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**Wisconsin State Cranberry Growers'
Association. Twenty-sixth annual meeting,
Grand Rapids, Wis., January 14th, 1913.
Twenty-fifth summer meeting, Cranmoor,
Wis., August 13th, 1912. 1912/1913**

Wisconsin State Cranberry Growers Association
[s.l.]: [s.n.], 1912/1913

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....WISCONSIN STATE....

Cranberry Growers' Association



Twenty-Sixth Annual Meeting,

Grand Rapids, Wis., January 14th, 1913

Twenty-Fifth Summer Meeting,

Cranmoor, Wis., August 13th, 1912

LETTER OF TRANSMITTAL

To the Honorable Francis E. McGovern

Governor of the State of Wisconsin:

Sir:—I have the honor to submit herewith in requirement of law, the Twenty-sixth Annual Report of the Wisconsin State Cranberry Growers' Association, containing papers read and discussions thereon, together with an account of moneys disbursed for the year 1912.

Respectfully yours,

Cranmoor, Wis., Jan. 15, 1913.

J. W. FITCH, Secretary.

26th Annual Report

Wisconsin State Cranberry Growers' Association

Tuesday, January 10th, 1913
Held at Grand Rapids, Wis., Council Rooms, West Side
Andrew Searls, President, presiding.

Meeting called to order at 9:30 A. M., with a large attendance of growers from the different cranberry districts.

ADDRESS OF WELCOME

Andrew Searls.

Ladies and Gentlemen:—

It gives me great pleasure to meet you this morning. Your faces certainly indicate that the past season has not been a disappointment to you. We are all feeling greatly encouraged over the outlook for the future of the industry.

I think, with good reason, that the improvements in the methods of handling the marshes, the pruning, sanding and weeding; better reservoir systems, better drainage, better knowledge of what we should do together and with the pumping plants established on many of the marshes, gives us the feeling that the business is not the wild-cat gamble it was several years ago. Our bankers too, have greatly changed in their estimation of the business. I believe that twenty years ago, it gave them the shivers to loan a cranberry man money to gather his crop of berries; he certainly had the shivers every cool night. I expect that is still the case where money goes out to bogs that are not keeping up with the procession.

It seems wise, at this time, for every grower to provide himself with every device and improvement to insure his future crop from the disasters which have so often befallen his crop in the past and which will certainly befall it again unless greater precautions are used. So I would urge you now, while success is with you, to greater vigi-

lance in preparing for the years to come for we certainly may look for trying seasons; we will get our frosts, draughts and floods, sometimes singly and often a whole string of them in one season. It is not the wise thing to do to neglect this matter; if we wait until we see the need of putting a pumping plant, for instance, it is usually too late to get one and have it installed.

MINUTES OF THE 25th MEETING.

The twenty-fifth annual meeting of the Wisconsin State Cranberry Growers' Association, was held in Grand Rapids in the council rooms, West Side, Tuesday, Jan. 14th, 1912.

President Searls called the meeting to order at 10 o'clock. The minutes of the previous meeting were read and accepted as read. The reports of the Secretary and Treasurer showed the expenses to have been \$187.12, with receipts of \$267.00, leaving a balance on hand of \$79.88. The President appointed Mr. Guy Potter, Mr. R. Smith and Mr. Joseph Bissig as the auditing committee, who found the vouchers and accounts correct.

The old officers were re-elected, viz.: President, Andrew Searls, Grand Rapids; Vice President, O. O. Potter, Grand Rapids; Secretary, J. W. Fitch, Cranmoor; Treasurer, H. J. Gebhart, Black River Falls; Member of Ex. Committee, J. J. Emmerick, Cranmoor.

In his address President Searls called attention to the necessity of growers providing against excessive drouths and recommended that the investigations of the pumping committee be continued.

Mr. O. G. Malde read a very interesting account of the year's work at the experiment station and told of some work planned for the propogation of selected varieties.

Mr. George Peltier had a very interesting paper on his study of the various insect pests.

Mr. Andrew Bissig read a very fine paper on "Cranberries in the Hands of the Buyer." There were many points brought out in the discussions of the different subjects.

The officers of the Association were appointed a committee to confer with the officers of the station as to the best means of obtaining and maintaining a bog for the commercial exploitation of the cranberry.

It was voted to have the pumping committee continue with its investigations.

The following resolution offered by the Hon. J. A. Gaynor was adopted: Be it resolved, That we, the Wisconsin State Cranberry Growers Association hereby express our appreciation of what has been done for our industry by the Weather Bureau in giving us timely frost warnings and we especially appreciate the valuable services

rendered us by the personal work of Prof. H. J. Cox on our cranberry bogs and his lucid explanation of the cause of frosts as lately published in Bulletin T of the Weather Bureau.

The following resolution was also adopted:

Be it resolved, That we, the Wisconsin State Cranberry Growers Association, being heartily in favor of legislation tending to prevent the importation of fungus diseases through the importation of nursery stock, do hereby call the attention of our senators and congressmen to Sec. 2820 and H. R. (123118) and ask their support of the same.

J. W. FITCH, Secretary.

**REPORT OF J. W. FITCH, SECRETARY OF WISCONSIN STATE
CRANBERRY GROWERS' ASSOCIATION FOR THE YEAR 1912**

Cranmoor, Wis., Jan. 14th, 1913

RECEIPTS.

| | |
|---------------------------------------------------------|----------|
| Received from dues | \$ 17.00 |
| Received from rs. J. Searls, sales from convention..... | 1.38 |
| | <hr/> |
| | \$ 18.38 |

EXPENSES

| | |
|------------------------------------------------------------------------------------------|----------|
| July 17, 1912, No. 160 Grand Rapids Trib., report and printing | \$ 42.30 |
| July 17, 1912, No. 161, J. W. Fitch, 6 months salary..... | 40.00 |
| Sept. 10, 1912, No. 162, Arpin Cranberry Co., centrifugal pump | 117.47 |
| Sept. 10, 1912, No. 163, Centralia Hdw. Co., Galv. W., 2 foot.. | 7.37 |
| Oct. 8, 1912, No. 164, O. G. Malde, for American Well Works | 34.00 |
| Nov. 6, 1912, No. 165, J. W. Fitch, expense, Aug. convention | 60.31 |
| Jan. 14, 1913, No. 166, E. E. Johnson, St. Paul, Minn. joints for pump | 21.00 |
| Jan. 14, 1913, No. 167, Arpin Cranberry Co. for pump fixtures | 35.43 |
| Jan. 14, 1913, No. 168, J. W. Fitch, 6 months salary \$40.00 and postage \$18.90..... | 58.90 |
| | <hr/> |
| | \$416.78 |

Orders No. 167, \$35.43, and No. 168, \$58.90 outstanding and unpaid.

**REPORT OF H. J. GEBHART, TREASURER OF WISCONSIN STATE
CRANBERRY GROWERS' ASSOCIATION FOR THE YEAR 1912**

Black River Falls, Wis., Jan. 14, 1913.

RECEIPTS

| | |
|-------------------------------------------------------|----------|
| Balance on hand Jan. 10, 1912..... | \$ 79.88 |
| State Aid June 15th, 1912 | 250.00 |
| Received from Sec., dues, etc., Jan. 13th, 1912 | 18.38 |

DISBURSEMENTS

| | | |
|-----------------------------------------------------------------------------------|----------|----------|
| July 17, 1912 No. 160, Grand Rap. Trib., reports and printing | \$ 42.30 | |
| July 17, 1912, No. 161, J. W. Fitch, 6 Mos. salary.... | 40.00 | |
| Sept. 10, 1912, No. 162 Arpin Cran. Co., Cen. pump.. | 117.47 | |
| Sept. 10, 1912, No. 163, Cen. Hdw. Co., Galv. Iron.... | 7.37 | |
| Oct. 8, 1912, No. 164, O. G. Malde, Amer. Well Works | 34.00 | |
| Nov. 6, 1912, No. 165, J. W. Fitch, Expense Aug. Conv. | 60.31 | |
| Jan. 14, 1913, No. 166, E. E. Johnson, St. Paul, Minn., for pump fixtures..... | 21.00 | \$322.45 |
| | \$322.45 | \$ 26.81 |
| Balance..... | | \$26.81 |

On motion made, seconded and carried, the secretary cast the ballot for the old officers.

President, Andrew Searls, Grand Rapids.

Vice President, O. O. Potter, Warrens, Wis.

Secretary, J. W. Fitch, Cranmoor, Wis.

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

Member of Executive Committee, J. J. Emmerick, Cranmoor, Wis.

SECRETARY'S ADDRESS.

Wisconsin this year produced the largest crop that it has produced for many years (since 1890), and it would be well for growers to study to see whether their crops were the result of applying the knowledge gathered since that time or whether it was due to especially favorable weather conditions, for with the exception of some new boys and some where an extra effort to improve conditions has been made, the last five years has not seen such a generally good crop on all kinds of vines.

I was called upon by the Secretary of the Board of Public Affairs to give a report of our Association; what it had accomplished and was doing, and I gave a history as best I could, making the point that but for the Association and the aid coming from the state when it did, the industry would probably have gone, as it has in many states where they once grew wild.

It seemed to me very plain in looking back over the conditions under which the cranberry industry has reached its present position, that there were three very marked changes in its growth, due to natural conditions or perhaps conditions that more or less follow the settling up of the country.

When first brought to the attention of the pioneers of this state, the vines grew on what was called floating bog, and as far as I can learn, very fine crops of good berries were gathered off the vines. By floating marsh is meant about four or five inches of sod resting upon

water which rose and fell as the water became more abundant or scanty as the season might be. At the present time there is very little of this sort of bog except in the cases of reservoirs where the water is held unusually high by artificial means.

When the value of the crop was seen, attempts to improve this condition by ditching, etc., were made with the result that the floating sod grew to the soil below making a very different condition to be handled. This was the general condition when the fires of 1893-4- and 5 wiped out fully 90 per cent of the vines in Wisconsin. Previous to this time some growers had begun to cultivate by planting in various ways, scalping, plowing, etc. These new pieces seemed to be superior to either of the old conditions, and even through the dry time when the fires raged, these seemed to grow and bear, and this makes the third stage, at present, though there is much difference of opinion as to the best methods of cultivation, practically all of the present bearing bog is of this kind.

It seems to be quite generally admitted that the young vines bear well up to a certain time, when as the bog gets more thickly covered with vines, and often brush and grass, the yield begins to get less certain, berries get smaller, they are more affected by frost and blight. This has been especially noticeable in the crops of some of the large bogs at Cranmoor on which the last year's crop is the first good one for several years back. And the reason for this should be discovered and remedy found if possible. It has seemed so clear to me that I venture to give it in the hope that something might come of at least a discussion of it.

Speaking rather crudely, it may be said that ability of any plant to produce abundantly is governed by the amount of nutriment supplied from its roots or feeders, and a sudden deprivation of the same results in checking or stunting the growth, which as in other life, is never really overcome or the bad effects of it, generally speaking. Now is not this what really happens to the ordinary bog under present conditions? We have learned that the cranberry vine gets its nourishment from hair roots which grow in saturated air close to the surface of the bog. Under the first condition mentioned, (the floating bog), the sod always resting on the water where it would be warmest, the moisture condition was practically the same, hence the hair roots were in no danger from lack of moisture, the condition of the air being constant. What would be the result of taking away this water and settling the sod on the cold sub-soil, where the water now falls and rises according to the rainfall? Again as I can ascertain, the floating bog was not so grassy as the present bogs and the debris to fall on the surface was much less than on the ordinary bog, and it is quite probable that on the floating bog this rotted and formed a natural condition for the hair roots. Does this happen the same on the present bog? There

being much more foul matter, the ground becomes more heavily covered, the vines run out on this root in it if there is moisture enough, if not they keep on running. They get a small rooting once in a while in a favorable season for growth with rain, etc. A fine growth of vines and buds might happen, but the next season, in the midst of a profuse blossom a dry hot spell with wind sets in, the hair roots in this loose mulch of rotten leaves, hay, etc., get dried out at least many of them with the result that berries do not feed and we hear talk of blight, etc. The same things often happen in August when it seems that berries are well advanced and promise to be extra size, along comes a dry spell and they seem to stand still and the crop is almost invariably small sized berries. Can this problem be solved or remedied? I am very well satisfied that our enterprising President, Mr. Searls, has solved the problem, and that it eventually means the production of many more berries in the future than have ever been produced in the past. I fully realized that the work of the experiment station has been a very potent factor also, but it seems very difficult for experimentors or investigators to have the results of their work bear fruit until they have been put to the test and proved to be a success financially, and it is to be hoped that the near future will see this handicap removed from our station and means provided that the industry may be exploited in a commercial way. For the last five seasons Mr. Searls' bog, with possibly one season of partial failure, has produced good, unusual crops. He has told us often of his methods, clean culture and sand, but Mr. Searls also drains, and yet I am going to venture an opinion, that with more drainage, Mr. Searls would have less vines, not as many berries, but more barrels per acre.

J. W. FITCH, Secretary.

REPORT OF THE WORK AT THE CRANBERRY STATION FOR THE SEASON OF 1912. O. G. Malde.

The Station was opened April 12 with only some preparatory work being done the first few days, while the winter flood remained on. The winter flood was dropped on April 22, and left for about a week, when owing to a severe cold wave approaching from the west, and the evident need of the vines for protection during such a cold wave, the flood was again put on and left on for nearly a week.

Owing to the heavy freezing previous to the application of the winter flood in the fall of 1911, and also dropping away of water from under the ice late last winter, about 45 per cent of our planting had heaved out enough to need replanting. This work, which takes more time than the first planting usually does, kept our help busy for a considerable time. It has been found to be a fact that where new planting is done on fields of sanded bog, in most cases such planting must receive earlier applications of winter flood than old planting does, and

this must be done the first two autumns, but most particularly the first autumn, as we find that the hills planted through three inches of sand have a great tendency to heave in the same way that clover heaves out of the ground in the winter, such heaving starting when the temperatures prevail below 20 degrees above zero, during the latter part of October or the first part of November.

This heaving does not seem to take place so much where sand is applied on a deep bed of peat, but is most apt to take place where sanding is done on shallow peat or on bog underlaid with gumbo just a few inches below the sand. We find that on the experimental station where the peat is very shallow, that such heaving occurs very early, and in order to avoid heaving of new planting we should apply our winter flood on this new planting late in October or very early in November.

Considerable time was also spent in remodeling some of the sections on the cranberry station, these sections having been originally laid out with wide berms placing the ditches nearly four feet from the dams, thus necessitating the planting of vines on these berms and these berms invariably became very foul with weeds, and the vines had a great tendency to grow up over the dams. We find it much more economical for space in each section to be planted when the ditches are within 8 inches or one foot of the dam. This 8 inches or 1 foot of the dam representing the berm and thus not needing any planting of vines on it and yet stops any accumulation of material from the dams that would have a tendency to drop into the ditches. In this way there is eliminated also the growing of vines from the planted area up on to the dams and also of the infestation of the planted areas by both weeds and insects from the dams to as large a degree as was the case when the vines were planted close up to the dam.

A great deal of weeding was done the latter part of May and the first part of June on all our older planting, as we find that the month of May is really the best month in the spring to successfully do our weeding and no other time seems quite so favorable until late in September or early in October. At these times some of the very bad weeds seem to be most easily pulled out of the ground, that is, they can be pulled with a less percentage of breaking at the crown which is the case during the very active growing season of these plants.

Insects—The insect pests did not make very large showing during the season of 1912, probably for several reasons, among which the following seemed to be most prominent. First, the heavy rains during the fall of 1911 apparently had a very detrimental effect on insects like the yellow head and the cranberry fruit worm. Also the heavy rains of the season of 1912, especially during that part of the season

when the appearance of the black head, the yellow head and the fruit worm is usually expected, that is, between the middle of May and the middle of July. These insects appeared to have greatly checked by these rains and as in the case of the fruit worm especially, which was very abundant in 1911 and which we would naturally expect to emerge in large numbers in 1912, there were but a very small quantity of millers emerged, except in a very few instances, and all data we are able to find and trace to this scarcity seems to indicate that the heavy rains had a very disastrous influence on the cocoons, thus preventing the regular development and emergence.

It further appears quite evident that together with the heavy rains, winter conditions, or rather winter protection, was also a controlling factor, as we find that where the largest number of insects, especially the fruit worm, emerged the past season, it was on bogs that were especially well protected during the winter both by the maintenance of good winter floods and considerable snow, while places where, as in the case of the experimental station, part of the winter flood seaped away from under the ice and thus permitted quite deep freezing, as was evidenced by the heaving of several plots on the station, quite thoroughly proved that this poor winter protection was the cause of the small amount of fruit worm emergence on the station, while bogs such as mentioned above, with very good protection, had the insects emerge in large numbers, especially on plots which had not been flooded immediately after harvest in 1911, as had the plots where the 1911 infestation had been very great.

A few things concerning some of these insects which had not been observed to any extent before, were the facts that during May we found the yellow head millers quite plentiful in Price county, a short distance from Phillips; yellow head millers had also been observed at this place late in the fall of 1911. This was a wild area 75 miles from any cultivated bog. The same kind of observations were made in Washburn county on wild marshes 25 miles from any cultivated bog. These yellow heads were feeding on "leather leaf" (*Chanaedophore calyculata*, L.) and "sage brush" (*Adromeda palifolia*, L.). The indications are that these insects, as also the fruit worm, which was found late in August at work on wild cranberries, both in Price and Lincoln counties, have been in existence on the wild marshes in the state from times unknown and only periodically become plentiful enough to be noticed by people interested in cranberry crops of wild marshes.

The fruit worm study which was carried on in 1911 and plans for which were made to be continued in 1912 by the storing away of something over 1200 cocoons in cages, late in the fall of 1911 were seriously checked by the fact that when these cages came to be examined this spring it was found that more than 90 per cent of the

worms had escaped, they must have escaped before going into their cocoons. The reason appeared to be that we had not used a screen of sufficiently fine mesh to hold the worms inside and the consequences were that we this year found but about 50 of these cocoons, and out of these but few were observed to emerge, the majority being dead when uncovered in the cages, yet with the abundance of the fruit worm on the cranberry station during 1911, but very little material was found to work with during 1912 and the first emergence was noticed on July 8, or one month later than the emergence of these insects in 1911, and about three weeks later than normal. Indications later found on the bogs however showed up that undoubtedly a few of the millers had emerged about July first, as larvae appearing to be about one week old were found very shortly after the first emergence of millers in cages that we were observing. The scarcity of fruit worm on the station during the season was also characteristic of a great many of the other bogs that in 1911 had been troubled to a great extent. There were, however, a few exceptions, and in these cases we were able to secure material for continuing or observations. We have at present stored away 1500 cocoons in various cages and have kept very close watch of them until the season closes so that we are quite confident that with our covering the cages this year with a heavy grade of cheese cloth and the fact that in November we found a very large number of these cocoons could be easily found in the cages that no escape has been made and our work on getting some final data on the emergence of this insect this spring should be unhampered, unless for some climatic reason the larvae fail to live thru the winter. No spraying was done at the station during the season, owing first to the fact that materials ordered mysteriously got misdirected and were three weeks delayed in reaching us and when they did reach us the indications were that insect injury would be very light and did not warrant immediate spraying. Continued postponement of that phase of the work showed that it would not be necessary to make any spraying applications. The heavy rains which also continued during that part of the season had considerable influence on our hesitating to make any spraying applications, as we could not depend on getting the spray to stick long enough to have been of any material assistance in keeping down the insect pests. Owing to calls for considerable work outside of the station in the way of looking over the wild marshes for people interested in finding out if their properties were suitable for cranberry growing and other urgent work at the station, we did not attempt to do any cooperative spraying on the outside and only on two bogs in the Cranmoor district were the insects in sufficient quantities to have warranted any spraying, this being at Elm Lake and Mr. Andrew Searls'. We estimate that the fruit worm damage at the Experiment station was less than 2 per cent.

Again in the season of 1912, as in the season of 1911, the "tip worm" was found quite plentiful in the Cranmoor district and it is questionable whether if this insect continues, it is not going to become quite a serious pest. Undoubtedly this insect also was kept greatly in check this year owing to the wetness of the season and we would judge from the amount that did actually show up this season, if the season had been normally dry, we suspect there would have been a great amount of damage done by its working very late on the vines and thus preventing the setting of buds which would mature fruit the following season, which is possible when this insect works fairly early in the season.

Although the present season was very wet, there did not appear very many fungous diseases, only one case of "Sclerotinia" was found in the Mather district, while a little "Exobasidium" was found in both Mather and Cranmoor districts.

Since the cranberry crop was marketed, it has been found that much of the fruit has become soft, and has been of rather poor keeping quality. In the case of the softening, it has in many cases been on one side and this makes one suspect that it may possibly be a trace of the so-called "scald" , as found in New Jersey. This has not shown up enough to be actually identified, however, but some material on hand which will be put in culture may develop sufficient fungus to give us indications whether it is the "scald" or not.

There is little doubt, however, that considerable damage to fruit which is not fruiting, (keeping) well after harvest this year, as in the case of most of our nursery stock which has just been sorted at our storage in Madison, the softening of a great many of the cranberries may be a direct water injury caused by flooding or by the bright sunshine immediately after some very heavy showers about the time that the fruit was ripe.

While no new fertilizers were applied in the season of 1912, very interesting results were noted on plots of the experiment station which had had fertilizer applied four years.

| Plot | Part of Acre | Treatment | Quarts Harvested | Bbls. per acre |
|-----------------------|--------------|----------------|------------------|----------------|
| E IV NW $\frac{1}{4}$ | 1-40 | Sodium nitrate | 133.3 | 133.3 |
| E IV SW $\frac{1}{4}$ | 1-40 | Sodium nitrate | 375.3 | 150.3 |
| | | Acid phosphate | | |
| E IV SE $\frac{1}{4}$ | 1-40 | Acid phosphate | 312.5 | 125.0 |
| E IV NE $\frac{1}{4}$ | 1-40 | Blank | 229 | 91.6 |

This shows that while fertilizers do not show their influence on cranberry production very quickly, the treatments show their effect on the crop for an extended period.

While new vines in prime condition do not need fertilizers, it is

quite evident that where the vines have become old, the use of fertilizers would be an advantage where bogs are otherwise clean. However, with the amount of grass on most bogs, we do not feel that it is policy to recommend the use of fertilizers as the grasses make very great growth after the application of these fertilizers, and in several ways this makes a rather discouraging appearance, with much less good results in the increase of crops than where the vines are clean. Where new planting is to be done, however, and the use of fertilizers is wanted, we deem it most advisable to apply raw rock phosphate on the scalped ground before the application of sand and then the newly planted vines will have full benefit of the fertilizer while germinating weeds at the surface of the sanded area would be eradicated before their roots would reach a depth at which the fertilizer has been applied.

The value of a sanded marsh where they have a large number of light summer frosts, as we do in the central part of the state, has for the ninth time been demonstrated to be of great help.

For the ninth season the cranberry station has been carried through a succession of frosty periods in each growing month of the season and no application of water for the protection from frost was necessary between May 10 and September 26, while floods were needed on other bogs at varying times during the growing season and especially on the nights of June 6, 7, 8, 9, and 10, when bogs had to be protected owing to the severe cold wave which was at that time passing over the country and caused damage on unprotected bogs in this state as well as in New Jersey and Cape Cod.

Just as an illustration of what sand will do on bogs in Wood county, we can submit the following illustration. On vines planted in 1906 on bare peat and for two years simply kept weeded, but this weeding greatly distributing and retarding the growth of the vines, when in 1908 some plots were marked off for check plots, and others had the application of $\frac{1}{2}$ inch of sand and 1 inch of sanr respectively. The results this year are as follows:

Yield in barrels per acre in equal sized areas with no sand, one-half inch, and one inch of sand.

| Plot | Part of acre | Treatment | Qts. Bbls. per acre | |
|-----------|--------------|-------------------------|---------------------|-------|
| A No. 1' | 1-150 | No sand | 11 | 16.5 |
| A No. 1'' | 1-150 | No sand | 17 | 25.5 |
| A No. 2 | 1-150 | $\frac{1}{2}$ inch sand | 58 | 87.0 |
| A No. 3 | 1-150 | 1 inch sand | 101 | 151.0 |

The above data confirms the results of three previous seasons' records on these plots and shows the crop value of sanding in itself stimulating cropping as well as previously shown, aids materially in warding off light frosts.

The question is, however, often raised that on sanded bogs, the

keeping quality of fruit is spoiled. We, however, challenge this very severely because we do not believe it has been proven in any authentic way, but where such indications seem to have had their source is in the cases where such fruit has been harvested on sanded areas at the areassame season, or even later, than fruit has been harvested on the common Wisconsin bog, that is, the fruit has been left remaining on the sanded bog longest because it was found that that area would not freeze, so soon, and further the fruit that is growing on sanded areas, as we have repeatedly found is the case at the experimental station, where the fruit is sufficiently ripe to be harvested from one week to ten days earlier for the same varieties than is the case of on the common, unsanded bog. It will be plainly seen, therefore, that when harvesting is done on such areas at the same or later than on the ordinary bog, this fruit is much riper than the fruit harvested on those other bogs, and consequently has a poorer keeping quality, as all ripe fruit does compared to fruit harvested just before ripe.

The indications are very strong toward the fact that cranberry harvesting for different varieties which vary in earliness is not carried out systematically by the growers, nor is the season of the harvesting of particular varieties varying in their earliness studied very closely by the grower, that is, if the Prolific is an early berry it should naturally be harvested and marketed before either the McFarland or the Bennett's Jumbo, but this in many cases is not the case when harvesting is done. As a matter of fact, even our native Bell and Cherry could stand waiting until after the Prolific is harvested. Some process of harvesting along this line of judging by the ripeness of different varieties and harvesting at different times would obviate the so-called poor keeping quality of the fruit, as it is now put on the market. In this connection the marketing of this fruit bears the same relation as the harvesting, the earliest fruit should in all cases be culled out first in order to have it get off the market before the hardier fruits are marketed.

Our observations at the cranberry station indicate very strongly that the proper time to harvest most cranberries, especially such as are highly colored when ripe, is just as the very first appearance of the so-called "bloom" on the very earliest of the berries in any particular variety, as for instance with the Bell and Cherry we find that the bloom appears fairly early on the sanded ground at the experimental station and we find that the nursery samples harvested practically at the time of the fruit appearance of this bloom, or what appears to be just this bloom would be expected to appear, are the fruit that give us the best percentage of keeping quality when stored early in January or February.

Along with these suggestions we would suggest that the growers make some note of this and try to help themselves to recognize the

proper time to harvest their crops and that they make special efforts to harvest rapidly when such apparent proper conditions arrive. While it is apparent that some growers may have given this some thought and do recognize the proper harvesting time of some varieties, we have not found that it is practiced to any extent noticeable and your continued careful observation along this line among the various members of this association may in a short time greatly assist in solving this difficult problem.

Weed killing, experiments and recommendations.—While we have done a great deal of spraying with iron sulphate and acid weed killers for the eradication of weeds, we did not carry it on very extensively during the season of 1912, but a few tests were made and some co-operative tests were made on adjoining bogs where quantities of iron sulphate had been sent, for experimental tests by the American Steel and Wire Company. The use of this iron sulphate as a spray for killing weeds on young plantings has been tried but a little, but those tests tried indicate that it will greatly reduce the labor of weeding if such spray applications are applied early in the season before the buds of the uprights open, but after some of the weeds or mosses, such as the wood moss, have shown themselves to be growing quite vigorously, also the use of this same material when applied with a sprinkler on patches of fern, especially where these patches of fern have been trampled before the sprinkling is done, as also in the case of smartweed and ragweed, the effect is very marked and the majority of these weeds are killed on the first application. It is, however, very important that applications should be made very thorough and it must not be expected that just one application is sufficient to eradicate all weeds, because both seeds that will germinate later, and spores, as in the case of the moss, that are not affected by the applications, and must first germinate before they can be killed. The use of about one quart of acid weed killer in one barrel of this iron sulphate is found to be very much more satisfactory for eradicating weeds and grasses on dams, but it is questionable if it is desirable to have all grasses on the dams eradicated, as they serve greatly to keep the dams from washing away, in times when floods are upon them.

General directions for the application of iron sulphate spray in the use of this mixture for eradicating weeds on cranberry bogs:

Use only brass lined pumps.

When spraying, use high pressure, so that spray is a fine mist, not drops. 75 to 90 pounds at the nozzle is best. This can practically be recognized when spray appears as a mist.

Apply the spray only long enough to avoid any dripping from the plant, as such dripping is waste.

To dissolve iron sulphate empty sack of sulphate into burlap

sack and suspend near the top of a 50 gallon barrel filled with water. A 100 lb sack of iron sulphate in this way will give approximately a 20 per cent solution which is the common strength used for spraying.

The application recommended is at the rate of about 2 barrels to the acre; where dams are sprayed it of course is difficult to estimate the area and it is chiefly a matter of applying a good spray and avoiding wasting the material.

To use iron sulphate in checking wood moss or small weeds on new planting, it is desirable to use a spray of 15 lbs. of common salt and 50 —s. of iron sulphate in 50 gallons of water. This can be applied in the spring before the vines start growing. Two sprays can sometimes be applied in spring before vines start growing, to kill moss and other small weeds, and again late in July after berries are set and far enough developed to be of the size of a small pea. The precaution must then also be taken to see that there is no very young tender growth on the vines to be sprayed, and do not apply this material at this season without a very urgent reason.

Never spray this material on vines in blossom nor on vines where very tender young growth on the upright or runner.

For moss this application would also be effective if applied about harvest time or after crop is harvested.

When first starting to use any of the spray material, start on dams or something until accustomed to handling both the material and the apparatus.

Knapsack sprayers are not very desirable except in very few cases and when used one should always secure the copper tank which will not corrode so badly as the tin.

Although most of our work has been done with the so-called Bordeaux nozzle, it is possible that just as good work can be done with other types of nozzles, but we have not gotten desirable results in our experiments with other nozzles, chiefly because the Bordeaux nozzle throws out a flat spray at an angle that can be best watched when spraying plants near the ground.

It is generally conceded, I believe, that the crop and season have been very favorable in 1912, although it is to be deplored that the keeping quality of the fruit is not up to standard.

It is too bad that the Berlin district suffered so heavily during the September floods and we hope that they will not have that misfortune repeat itself in the coming season. The Mather district seems to have had a very favorable season although it is doubtful if they have had quite as successful a season as the Wood County, where the harvest for 1912 was extra good.

The crop at the cranberry station was very good this year considering the area in berries, as we have the past two years been encroaching on our bearing area in order to have more room for pro-

pagating purposes and variety testing with a few of the most common standard varieties grown in Wisconsin and in the East. Owing to difficulty in securing help for the harvest part of the station crop was harvested on the flood, and out of 305 boxes harvested, 29 boxes of soft stuff, or "slush" were picked out. The crop was sorted very late in November and possibly the stock as shipped should keep very well, but we find occasionally a barrel that showed decided shrinkage. Two barrels out of 14 sent to Madison went radcially bad and had to be remilled with a loss of about 30 per cent. All soft material appeared to be chiefly water injury.

As we now have practically 10 years of complete records of our nursery and variety tests on the station, we hope to be able to publish a bulletin covering this work to date, as we have in the past harvested all our nurseries in two or three pickings, varying from one week to ten days each in order to get data on keeping qualities with reference to time of harvesting. We have a large accumulation of data on this subject, which together with observations throughout the state and during the past two marketing seasons, a great deal of data secured through the inspection of shipments of the crop from the Cranmoor district, the accumulation of all this data seems to warrant the summing up of results and deducting a few important points from them which should have considerable value in connection with cranberry varieties from Wisconsin, and would therefore be desirable to put before the cranberry growers very soon.

Owing also to the fact that we in the past have desired so much data on the varieties, the station crop has been harvested very late and it will be the policy in the future to harvest station crop earlier and secure much better keeping quality on the major part of its crop, as only very small parts will be needed for continued tests along this line.

MY EXPERIENCE IN HARVESTING CRANBERRIES.

(Andrew Searls.)

I suppose my experience in harvesting cranberries has not been very different from that of those who have been in the business twenty years or more, but it may revive old time memories in them to show the younger growers what progress has been made in harvesting cranberries.

I will speak of one year in particular, I think it was twenty-three years ago. My brother and I were harvesting cranberries on one thousand acres of marsh. We had this ground under what we were pleased to call cultivation, and I think it would have passed muster as such at that time. We employed eighty-seven men; eighty as rakers and seven as helpers to get the berries to the warehouse. We also had about two hundred women, children and older men picking

berries. My recollection is that we gathered one thousand barrels that season.

I still have a very distinct recollection with what gusto they would put the barrels of pork out of sight, as well as other quantities of provisions. I also remember that there was a margin on the right side of the ledger to encourage us to further efforts to grow other crops, to repeat the performance of gathering and the mobs of every class of people to be fed and amused and well paid. In those days the pickers would get in a playful mood and tell us what we had to do, and in fact, fix a new scale of prices for picking; and as our crop of cranberries was in danger of being destroyed by frost, we usually had to come up to their way of thinking. Indeed, this was as surely to be looked for as we had a crop of berries to gather. Indeed they carried this practice too far and one season I got mad and told them to get out and I would rake the berries, which I did with some satisfaction, to myself anyway.

It has been a good relief to be free from this mob whom you must amuse, for it came to such a pass. We had to run a dance hall and furnish the music; the pickers condescended to do the dancing which was a great relief for I never was much of a dancer.

During the past few years we have been pruning our vines, sanding them and training them with a view of having the vines in condition so the crop of berries may be gathered more cheaply, as well as being more certain of having more and better berries to harvest.

In training the vines, we endeavor to have them all trained to lean in one direction, always requiring the men to rake or scoop the berries in the same direction when harvesting; year after year, never permitting any deviation to this rule; otherwise the vines would become tangled, necessitating the cutting out of large quantities of vines when pruning, although when re-sanding is practiced there is less danger of the vines becoming tangled as the sand permits the vines to put out new roots each year, keeping them short and less liable to be tangled by the men when scooping the berries.

During the past season my son and myself have gathered a crop of about 2900 barrels, employing four men in scooping the berries and seven men getting them into the warehouse and I think we have put in more berries, day after day, than my brother and myself did twenty-three years ago with the great mob we then had with us, besides having nearly three times as many berries gathered from less than twenty-eight acres of ground, seven and a half of which was of two and three years old planting.

We have, in recent years, practiced scooping berries from a low flood of water. This is a very rapid way of gathering, especially where the vines have been thoroughly pruned and trained and where conditions are favorable. Indeed, so rapid, that our men averaged

125 bushels per man one day the past season. Indeed, the average every day was well up to this figure but the weather was unfavorable, making it impossible to properly cure and dry the berries causing our sales agent great trouble and annoyance and ourselves considerable loss.

We tried dry scooping after we had resorted to pruning, training and sanding and found we could do very satisfactory work without flooding; in fact, instead of having several men drying the berries after we had them gathered from the water, we could put the whole crew to gathering and our berries did not cost us any more to put into the warehouse than they did when gathered by the other process. Our highest days averaged about eighty bushels per man but conditions were not so favorable for rapid work as they were when 125 bushels were harvested.

Our plans for the future gathering or harvesting is to dry rake our crop, not permitting any berries to be gathered until the dew is off in the morning, employing the men in the early morning to prune and train the vines, and remove weeds and grasses. Under this plan, we will be able to begin our harvesting at any time we think the berries are ready to harvest; when harvesting on the flood plan we had to wait until the water was cold or be in danger of having our berries scalded and when gathered later in the season, they were liable to become over-ripe.

I realize that the Wisconsin cranberry grower must use the greatest care in gathering and picking his berries that they reach the customer in good condition.

OUR LEADING VARIETIES DESCRIBED.

Metallic Bell.—Originated with Mr. Hamilton at Berlin, Wis., and was propagated at the Baker marsh at Shennington. A large, long, well colored berry. It colors up early. Vigorous vine growth, but not so much as the McFarlin. Good yielder and better keeper than Bell and Cherry.

Bennetts' Jumbo.—A native of Berlin. Mr. A. C. Bennett first saw the berry on sale at Ironwood, Mich., in the month of June. Was two years in locating the vines. It is as near pure as any berry known except those propagated from single vines. A late variety, melon shape, light color. Will stand the latest picking. When late picked a fine looking berry. A good yielder; not as good a yielder as the Prolific.

Prolific.—Came from Walton, Mich. Gaynor Bros. first got a barrel, then a carload. Mr. L. P. Haskins bought the original vines and sold them to Wisconsin growers. A round berry, same diameter each way. Meaty. Vigorous and prolific. Very good for the early market. Keeps poorly when late picked. Easy to mill.

Berlin, Bell and Bugle.—An earlier berry than the Natives. Not as popular as other varieties as they seem to run out; a very fine and fancy berry and popular in the market on account of fine size and appearance. Vigorous vine growth.

Searls Jumbo.—Evidently a native seedling found on Searls bog in a brush patch. Mr. Searls has been propagating them for 20 years. Olive or melon shape. Heavy yielder, not as late a keeper as Bennetts Jumbo. Colors earlier and much darker. Later than Prolific.

Wisconsin Bell and Cherry.—The native Wisconsin berry. Uniform in size and color, generally Prolific. The main crop today, a very good variety, good keeper and fine flavor. Mr. B. H. Porter said years ago they were good enough and growers were foolish to try other varieties. The general opinion was that it was better to plant selected varieties.

McFarlin.—The grower at Cranmoor did not seem to like them but at Mather they were well pleased with them. Only two of the six strains in the East had been tried at Mather, viz., Makepeace and McFarlin. On Mr. H. S. Delong's bog 4 acres produced 400 bbls. There were no pie berries. A very fine berry. One of the best was the opinion of Mr. E. K. Tuttle of Mather.

WISCONSIN VARIETIES ON THE MARKET.

January 14, 1913.

Mr. President and Members of

The Wisconsin Cranberry Growers' Association:

I regret not being present to personally respond to the subject given me and to hear the interesting discussion on the various varieties. I have taken the liberty to ask Mr. Bissig to read a brief paper for me.

All the varieties listed are good when they have keeping quality and it seems to me the keeping quality of all varieties of Wisconsin cranberries greatly depends upon the harvesting. Cranberries, I believe, should be harvested when they have reached just the proper maturity, and that time, evidently, varies greatly with the different varieties. Some varieties must be allowed to ripen and color fully on the vines. McFarlins, for instance, seem to take on very little color after they leave the vines and the well colored McFarlins from Wisconsin seem to keep better than when they are not colored. It therefore seems to me that variety does not reach proper maturity to harvest until it is well colored. The same, to a less extent probably, should be said of the Bennett Jumbo. The Metallic Bell is perhaps the most attractive berry when it has keeping quality and retains its gloss. This berry, however, is apparently very difficult to get harvested at just the proper time. If it is harvested before it is quite mature, it seems to wilt and not keep, and becomes unattractive. It

ripens very quickly after it begins to color and seems likely to become over-ripe before it is possible to harvest them. They then lose their gloss, mellow up and keep poorly. If they can all be harvested when they are just pink, are about two thirds colored, I imagine they would be at their best. I believe unusual care should be taken not to harvest this variety when the dew is on them or the vines are wet. I believe all cranberries, but particularly Metallic Bells, should be harvested dry and kept in a well ventilated, shallow crates and be given plenty of dry air, but all damp atmosphere kept away from them. They should not be screened where there is a fire, or on a damp day. I believe if this variety were harvested and handled in about that way, it would prove a good keeper and an attractive seller.

We all know some varieties will take on color rapidly after being harvested, while others will take on none. Every grower should make a close study as to the proper time to harvest the different varieties and should know when that is. I am afraid some growers do not fully appreciate the great importance of this feature. If berries are harvested at the proper time and in proper condition so as to insure keeping quality, there is a great saving in shrinkage, cost of screening and risk of shipping.

The excuse is frequently made, and often true, that they have to harvest the berries when they can get the pickers whether the fruit is ready or not. In most such cases the growers would, in my opinion, be the gainers to pay the pickers for their time and let them be idle until the berries are ready in order to be sure of having pickers when the fruit is in prime condition to pick. Rather than let the pickers or rakers, harvest wet berries, I believe you would be ahead to pay them for a quarter of a days time and keep them off the bog until the berries can be picked dry. I do not, personally, think well of picking berries damp and drying them, even before they are stored. From such observation as I have given it, I believe that is bad practice.

Keeping quality for berries in the market is first and foremost consideration. Second—size and color and proper color is of great importance. Bright red or pink with a high gloss to the fruit, is much to be desired in the western markets. From the standpoint of color, I believe Wisconsin McFarlins that are well colored when harvested or the Prolific variety are nearest the ideal color of any of your berries this season. The Daisy brand medium size Bennett Jumbo, probably is the most popular Wisconsin cranberry in the market now, and entirely because of its superior keeping quality. This variety, however, off of one or two certain bogs, was a disappointment in this respect, this season. The color of the Bennett Jumbo is against it, but superior keeping quality makes up for it. The Bell and Bugle has a better color and if it always could be depended upon to keep as well

as the Bennett Jumbo, it would be most desired. The Bell and Cherry graded as it is now, would be popular everywhere if it would always keep, but during the last three years this variety has proven a continued disappointment in this respect, so that today, jobbers with limited trade are afraid to buy them and no jobber will buy them to store for winter trades. I believe if more care was used in storing and harvesting this variety, better keeping quality could be greatly improved.

I believe all varieties should be harvested dry, stored in shallow crates in the dry chaff as they come from the bog and handled and bruised as little as possible before being barreled.

Respectfully,

A. U. CHANEY.

HOW TO PREVENT DECAY IN FRUIT.

During the World's Fair in Chicago, some who are now present, may remember the tall columns in the Horticulture Building, composed of California lemons extending from the ground floor to the top of the building to its dome. I was living in Chicago at that time and having charge of several exhibits there, I had a pass for the season and I was in the Horticulture building nearly every day. Observing that lemons did not decay, I called to see the party who had charge of them and I said, "I see that your lemons do not rot, do you cover them with wax? I thought the lemon was quick to rot." He said, "It used to be and we used to pack them in ice and ship them to Chicago, and then they had to be sold at once and we often lost heavily on them." "Now, he said, we can ship them without any icing and they will keep a long time or dry up." I asked him how he did it and he said, "Those of us who understand our business simply dry them a little and that is all there is to it, but they have not all gotten onto it yet." He opened for me several trays that had just come in from California, all packed, one layer in a tray.

When I went to California I had the pleasure of meeting the originator of that system of keeping lemons and was invited to his house and taken out to see his lemon curing and storage house. He also gave me a book illustrating and describing the process by which lemons can be kept fresh for a year and then shipped to Chicago without icing the car. In that book he stated his reasons for giving this process to the public free. He said that while he could get a little more for his lemons so cured, the amount he raised was so small that he had no power to raise the general market price for California lemons, and that Sicily lemons at that time were bringing one dollar a box more than California, on account of their better keeping quality.

At the World's Fair I also saw 125 Mummies said to have come from the Peru burying grounds of South America from under the

tropical sun. They all looked like dried up human beings. They had been buried in a sitting posture with their arms folded in front of them, with their hair and features nearly perfect.

I also saw a reproduction of the cliff dwellers of Arizona, showing the power of heat to dry up and preserve the human form.

We also realize this whenever we inspect dried beef, smoked beef or hams, or shoulders, and in fruit of all kinds which are preserved as long as kept dry.

Nearly fifty years ago I raised a fine lot of winter apples. I spread them out on a large double barn floor that was first covered with straw where I could sort them and barrel them after my falls work was done. These apples dried on the straw until many of them showed wrinkles on their surface, but their keeping qualities were greatly extended. They were sealed up in their own skin and kept till they were all used up the next summer.

I have kept our Jumbo variety of cranberries a year and six months in grand condition; the last six months they were kept in my desk in Florida. They were never kept in cold storage.

It is a law of nature that whatever grows quickly, goes to decay quickly, and we cannot expect cranberries or any other fruit that ripens early to keep late under normal conditions. The best variety of cranberries I ever saw were grown by Tuttle near Mather, Wisconsin, but they were nearly all perfectly white when they were ripe and seeds black. I have seen cranberries stored in a tight building without a chance to dry out. When shipped out they were barreled and they looked fresh and nice but soon went to decay. I have seen others stored in rough board shanties with cracks through which the winds blew freely, that kept much better.

I have stored cranberries in crates 2 inches deep with a free circulation of air and also in crates 6 inches deep with nearly equal satisfaction where the air has free circulation. In building my store house at Cameron, Wisconsin, after years of experience and observation, both in the east and west, I selected high, dry land to set it on, put a stone wall under it all with small windows, held by spring bolts near the center of the sash so that they can be left partly open at all times. From the basement to the cupola on the west and east sides there are air spaces 2 feet wide and 6 inches deep, which can be opened or closed at any moment. The space between the outside of the building and inside is filled in with thoroughly dried saw-dust left loose. The roof forming the bottom of the cupola can be thrown open to let the air from the entire building pass out as freely as from an open chimney or closed up like two outside cellar doors by ropes operated from the main floor. The air from the basement can also be shut off from below and not pass out through the cupola, leaving only still or dead air in the store room so that the berries can be dried

to the degree best suited to keep well and still remain plump and fine for shipping.

In Arizona and many parts of the country the air is so dry that hunters can dress the animals they kill and hang them up on trees to dry for months without selling them.

I would here suggest that our small berries be made into cranberry cider or vinegar or spiced vinegar which would soon command a high price and have all the world for a market and sell every day in the year. I was born in the finest fruit growing section of the world, and have seen thousands of bushels of apples unfit for market made into apple cider and vinegar. The process is very cheap and should be profitable. Cranberry jelly might be more profitable.

A. C. Bennett

A METHOD OF RECORDING TYPES AND VARIATION IN FRUITS AND VEGETABLES BY DIRECT PRINTING.

(O. G. Malde, In charge of University of Wisconsin.)

*"We acknowledge with thanks the loan of the cuts from the American Breeders Magazine.

"Since this article was first printed in March, 1912, it has been found that Byron D. Holstead, Botanist for the New Jersey Experiment Station, reported on a method of "Ink Printing of Vegetables Fruits," in the 26th annual report of the N. J. State Agricultural Experiment Station, (18th Annual Report, N. J. Agricultural Experiment Station) for 1905.

A special printing method has been employed with success in keeping records of cranberries in connection with nursery work at the Wisconsin State Cranberry Experimental Sub-Station, located at Grand Rapids, Wisconsin. Propagation by selection is carried on with about one hundred and sixty beds started from single cuttings of cranberry vines which were originally found on a few bogs and in wild marshes and which produced some exceptionally fine fruit. From the very choicest of these, seeds have also been planted, and about thirty-five new varieties have thus been established. The recording or scoring is done on a basis of 10 for twelve characters or qualities, as follows: Size, form, color, gloss, uniformity, keeping quality, firmness, flavor, productiveness, vigor of vine, time of flowering, season (early or late.

The first two characters on this score card it will be readily seen, would require several measurements and considerable description. Size and form were first recorded by taking the measurements of three diameters of the berry. These, however, proved to be of little value for later reference, especially when it was necessary for the

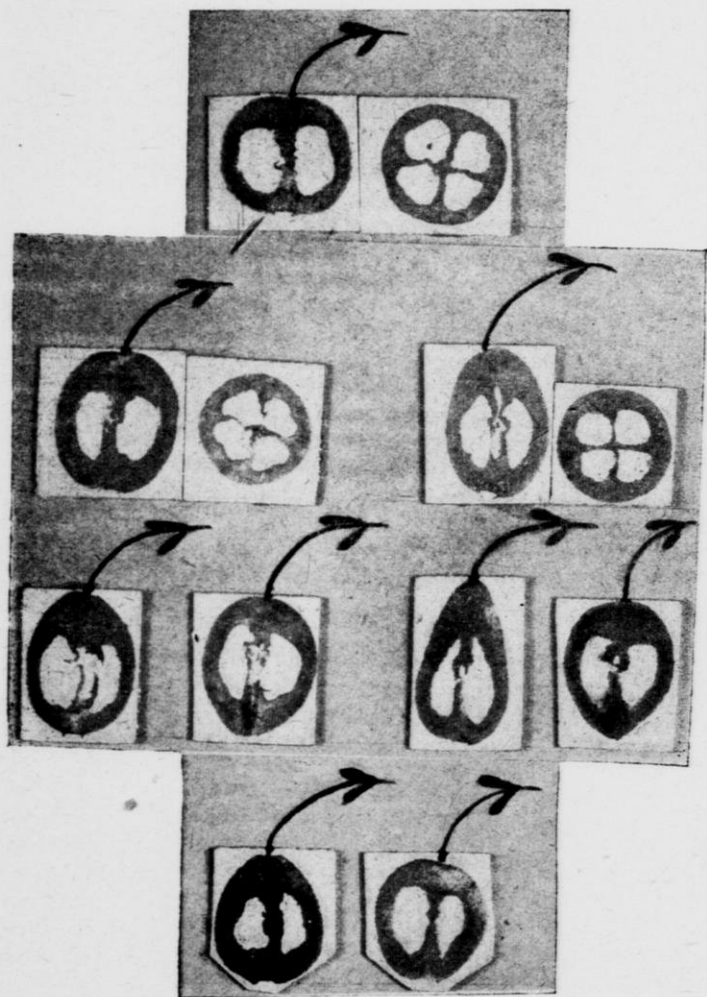


Fig. 1.—Prints of the Three Main Types of Cranberries.

Rows 1 and 2.—The round or "Cherry", the oval or olive, ("Jumbo"), and the long or "Bugle."

Rows 3 and 4.—Six sub-types, two for each main type; the first tapering at the stem end and large at blossom end, called "Bell." This is the most common sub-type. The second sub-type is large at the stem end and pointed at the blossom end, like an inverted "Bell." It is described as a pointed berry, and is not common. The second sub-type of the "Bugle" is rather rare, as nearly all of the sub-types tend toward the "Bell."

work to be continued by one not thoroughly familiar with the original method of taking the measurements.

Another character needing recording was that of the thickness of flesh, of different varieties, and the writer therefore, in the winter of 1907, tried numerous experiments in bisecting large berries, stamping them on a well saturated inking pad in the same way that a rubber stamp would be used, and then printing directly on cards or in the record book. The method was found so satisfactory that it has been adopted for the record books and also in making up card indexes. Fig. 1 shows prints of the three main types of cranberries, namely, the round or "cherry," the oval or olive ("Jumbo"), and the long or "Buckle" (Mathews).

The main types each have two sub-types, one being tapering at the stem end and large at the blossom end, or bell shaped (this is in fact the prevailing or dominant sub-type); the other sub-type, but not nearly as common as the bell, is the one large at the stem end and tapering at the blossom end, or appearing as an inverted bell.

The main method of bisecting to illustrate general form is by cutting longitudinally, while to show the general arrangement of the



FIG. 2.

The "Pick-Up."

A substitute for a pair of tweezers (full size.) This permits one to use some pressure in printing.



FIG. 3. Longitudinal and cross sections of ripe tomato (Imported.)

Purchased on the local market. Notice thickness of flesh and the seed mass contracted from outside walls. Reduced one-half.

cells the berry is cut transversely at its greatest front diameter.

Immediately after the fruit is cut it is placed on the ink pad and pressed down gently so that all of the cut surface may become inked.

Then it is picked up with a substitute for a Tweezers which consists of a No. 2 cork (fig. 2), with two pins extending about $\frac{1}{4}$ inch through and with the points about $\frac{1}{4}$ inch apart. This advantage of using the cork is that it permits applying pressure in making the print. In using the printing method with the cranberries all longitudinal prints are made with the stem end up. As the seeds easily shake loose when the berry is ripe there seldom is print of seeds, except where mature but unripe berries are used.

Fig. 3 illustrates the same method used with ripe imported tomatoes purchased on the market, and shows how well the thickness



FIG. 4. Cross section of "Comet" tomato.

Unripe and fresh from vines. Note the thickness of flesh and the clinging of seed mass to sides.



FIG. 5.—Cross Section of Celery Plant.
Arrangement of stems.

of flesh can be illustrated by this direct printing, and also shows how the seed mass in the ripe tomato has receded from the sides. Comparing two varieties not fully ripe and just removed from the plants in the greenhouse, one can readily see (as in fig. 4 of the "Comet") how well the thickness of flesh in the two is illustrated. In comparing these with fig. 3, one can see how the seed mass in the unripe tomato clings to the sides.

Fig. 5 illustrates the arrangement and size of stalks of celery.

Further tests with green peppers, carrots, onions (fig. 6), string and wax beans, apples, and pears have proved quite conclusively that this method can be used to much advantage in recording quickly characteristics and variations in types in connection with card indexing progress and results in various plant breeding experiments.

Such preliminary tests as have been made show that this printing method may be used also in copying cross sections of branches, or of galls and other injuries on branches. Cross section of bulbs can be

secured as can also stalks, buds, seed pods of simple-stemmed plants of the lily family, or the water hemlock, etc.

Some practice is necessary to secure the best results, and the following points should be borne in mind when this form of copying is practiced:



FIG. 6—BISECTION OF COMMON ONION.
Notice distinct outlines of layers.

(1) Have inking pad well saturated with regular stamping ink, red or black. Two pads are to be recommended in order that one may be freshly inked while the other is in use. There is considerable

difference in the amount of ink required for different objects.

(2) Medium weight cards with a smooth but not too heavily calendered, slightly absorptive surface, give best results. Straw colored semi-gloss cards of medium weight are also satisfactory. Cards are found best as they do not warp with slight moisture.

(3) Bisecting should always be done with a thin but rigid knife. Well worn case knives have given good results. Mounted Gillette safety razor blades are exceptionally well adapted to bisecting cranberries and other small fruit. An ordinary thick-backed razor is not suitable.

(4) Mature fruits or vegetables give best results when fresh and not quite ripe.

(5) Very juicy fruit should first be stamped on a smooth blotting paper or left on it for a short time, but not long enough for the edges to contract.

(6) It is necessary to work rapidly when bisecting and inking the material to be printed in order that none of the objects shall be left long on the inking pad, for if left too long on the pad they become very moist and must be stamped on the blotting paper before making a print on the card.

(7) In the case of a large and hard object such as an apple, it is necessary after placing it on the card to pass the fingers gently over the under side of the card to secure perfect contact with the printing surface.

Keep inking pad clean by frequently scraping gently with a piece of card board, knife blade or even a broom straw.

There are only a few of the fruits whose juices would sufficiently color the card to give satisfactory print and for that reason chiefly it is desirable to use the ink. One could no doubt print a red beet, without the use of ink, and fairly good prints of cranberries have been secured by means of their own juice alone. The chief difficulty is that the juice has a tendency to spread and this is avoided by the use of the viscid stamping ink.

BULKHEADS.

The problem of constructing and maintaining bulkheads, which confronts all Wisconsin cranberry growers, was one which caused me more worryment than any other problem connected with the business for a period of three or four years.

My first bulkheads were of the open type consisting of a floor and two side-walks braced across to prevent the earth pressing the walls inward.

The floor consisted of double thickness of boards, the top layer

covering the cracks of the lower layer. The sides were constructed in the same manner.

The floor was laid on two fences or mud sills which extended ten inches or two feet below the floor. This prevents leakage and tends to prevent musk-rats from burrowing underneath.

Six feet was the usual length of this type of bulkhead. It had several bad features.

Not being weighed down with earth, it had a tendency to heave by the action of the frost causing leakage underneath or along the sides.

When sand is used for filling purposes around the bulkhead it pretty much overcomes the heaving difficulty but causes another. I found the raising and lowering of the water in the bulkhead, causing the wood to change from a wet to a dry condition, together with the sand produced a condition favorable to rapid decay.

The underground bulkhead I find is superior to the open bulkhead. I built them four feet wide, two feet high, and sixteen feet long, using a two inch material. The front or mouth being the same width and depth.

Being covered with earth, the heaving difficulty is very much lessened and I seldom have any difficulty with leakage. The decay does not seem to be nearly as rapid, probably due to much of its surface being submerged in water most of the time.

The bulkhead being covered with soil makes it convenient when one wishes to use the dams as driveways as it does away with the expense of building and maintaining bridges over the ditches.

About five years ago I constructed a bulkhead of fourteen inch tiling. The two foot lengths I cemented together and fitted over the front end a short wooden underground bulkhead. This extended back over the pipe about two feet. The space between the tiling and the woodwork I filled with concrete.

It is yet in good condition but there are two features I do not admire in this type of bulkhead. Formation of ice within the tiling may injure it and the front being of wood, decays.

My experience in the use of tiling caused me to send for a two foot corrugated galvanized pipe twelve feet long. This I intended to insert into a concrete front or mouth-piece.

In discussing the bulkhead problem with the agent of the Bark River Bridge and Culvert Co., from whom I purchased the pipe, he suggested that I return the pipe to their Eau Claire shops and he would endeavor to make a front by riveting together galvanized sheets strengthening the sheets with angle-iron.

A collar was securely fastened around the pipe which was then bolted to the front. Angle-irons riveted to the sheets strengthen them and are also used for holding slash boards in position.

A circular opening permits the water to flow through the front into the pipe. Very little leakage occurs except when the riveting is too far apart. I have three bulkheads of this type and they give very good satisfaction. Two are in my reservoir dam. One consists of thirty-two feet of two-foot pipe with a four foot front. The other is the same length, three feet in diameter, and a ten foot front.

The earth pressing against the ten foot front caused the sheet to bulge forward. This I can remedy by bolting and angle-iron across the back which will come back to its former position when the bolts are tightened.

P

I consider these bulkheads superior to any I have had. The fact that a pipe of small diameter or large diameter can be used with the usual size front is an advantage. Sometimes a wide front is desired in a location where a small pipe can carry the water.

I intend placing one this spring where an eighteen inch pipe can easily handle the water but I contemplate using a four foot front. A four inch stream flowing over slash boards in this bulkhead would be equivalent to a flowage of over ten inches over slash boards in a front the same width as the diameter of this pipe. In case of sudden rain the four foot slash boards would carry a stream, which, if it had to force itself through the narrow one would raise the water to a much higher level and possibly overflow the vines at a time when such flowage might prove injurious to the fruit.

These bulkheads are very easily placed in position and so far as I am able to learn from those who have used piping for road culverts, the action of the water has produced no bad effect on the piping material.

Although the expense of a bulkhead 16 feet long and 2 feet in diameter with a four foot front is seven or eight dollars more than when constructed of wood, yet I am confident they are cheapest in the long run. The continual increase in the price of lumber necessitates our looking for other material for bulkhead construction.

The galvanized piping is proving to be superior to anything I have yet found.

HERMAN J. GEBHARDT.

RESUME OF THE DISCUSSIONS.

President Searls said that it seemed very certain that on the sanded and properly drained bogs the sand prevented any great variation of moisture and accounted for such bogs bearing better than the unsanded, as they were thus able to withstand unfavorable climatic changes. Satisfactory results will not be obtained from sanding unless good drainage is provided.

Mr. Malde examined the root system of vines on peat and on sand-

ed peat, (3in ches of sand) and was surprised to see how much stronger and vigorous those on the sand were.

The firmer or harder the land the less sand should be put on. The pressure of water from below was greater on muck than peat. Sand is worth 25 per cent of the water supply.

In answer to the question, Will sand affect the keeping quality? Mr. Malde said, "Not if harvested in time; that on account of the safety from frost, the tendency was to let them go too long, thus getting overripe.

Mr. Andrew Bissig said that the Cape Cod Howes were keeping well this season but that New Jersey and Wisconsin were not, due he thought, much to weather conditions at the time of harvest. Mr. Malde said that the first picking at the station were keeping well. That those softening were doing it on one side, due in his opinion, to rain. At the station the Early Blacks were picked last yet unexpectedly were the best keepers.

Mr. Tuttle said that he had practiced picking when the berries were ripe and full colored, still they had always kept. It was suggested that the trade was not so critical as it was now and that growers used to have the berries shipped out by the last of October, and they were not held as they are at present by brokers.

As to spraying to kill weeds, Mr. Malde said it was more effective in July but he would not recommend using it on the vined bog at that time as it would be apt to injure the vines which were quite tender until the bud formed. Walking on and breaking down the weeds seemed to give the spray a better chance to work. Acid weed killer was the best remedy for Sough Grass which could not be pulled. Where the spraying had been strong enough to kill all growth it would not be advisable to plant the piece to vines until after at least two years. Mr. Malde doubted the wisdom of applying it on the bog.

Mr. Searls said that he had used one lb. sulphate of iron to one gallon of water to kill fern among the vines; had saturated the ground so that he could not feel the water squash, about the first of July, no leaves of fern appeared that fall and only a few the next year. The fern had come out from the dam and was taking possession. It stopped this. The vines died in a few places but on most of the ground they were fine the next year.

Mr. Dan Rezin of Warrenton, Oregon, told of a number of bogs out there and said that sanding with a pump was not very satisfactory as the sand mixed too much with the peat.

Mr. A. E. Bennett said that he was not prepared to say whether it paid to grade or not; that the present year's experience had made him think it might not, but the consensus of opinion seemed to be

that the grading of fruit in cranberries as in other fruits was a present necessity.

Mr. Bissig said that the trade demanded the small or pie berries be taken out and were trying to force the eastern growers to take them out.

There was considerable discussion on the question of Nomenclature and the fact was brought out that marsh, bog, or meadow did not give the true idea of a modern cranberry plantation. The necessity of a better understanding of terms was thoroughly discussed by Judge Gaynor.

In answer to a question Mr. Searls said that his men averaged 80 bushel per day raking (scooping), that it was much more satisfactory than raking on the water as they did not have to wait for cool weather to gather them.

Mr. A. C. Bennett told of an experience with water on the berries. He commenced early, had one under water for a week, he thought it would hurt the berries. He got up one night at two o'clock and told his man to take the water off because it was turning warm. The man did not want to do it, but did. It turned warm; for two weeks the berries grew finely and kept well when picked.

The following resolution was adopted:—Whereas, there is to be a paid station of the weather bureau established in the Wisconsin Valley, be it resolved that as the cranberry industry is pre-eminent in the Wisconsin Valley in need of such service, that the station be established at Grand Rapids. The president appointed as a committee to attend to the matter, Judge Gaynor, E. P. Arpin and M. O. Potter.

The Wisconsin crop proved to be 52,000 barrels.

J. W. FITCH.

TWENTY-SIXTH ANNUAL SUMMER MEETING, AUG. 13th, 1912.

GAYNOR BROS. BOG, CRANMOOR, WIS.

The twenty-sixth annual summer meeting of the Wisconsin State Cranberry Growers Association was held at the grounds of the experiment station on Gaynor Bros. bog, Tuesday, August 13th, 1912. The day was perfect and the attendance very good. The morning was spent in inspecting the station, which was in very good condition and gave promise of a good crop of fruit.

At noon the picnic dinner under the supervision of Mrs. Jacob Searls, Mrs. Robert Rezin and Miss Fitch was served and thoroughly enjoyed by all.

President Andrew Searls called the meeting to order in the pine grove on the Gaynor bog at half past one and presided while the literary program was given.

Mr. Fred P. Downing, chief of the Bureau of Weights and Meas-

ures, of the Food and Dairy Commission of Wisconsin, gave a very interesting talk on the subject of the value of correct weights and measures.

Mr. J. W. Fitch gave a description of his visit to some of the eastern bogs on Cape Cod, which brought out some discussion on the question of bog construction and drainage.

Mr. O. G. Malde, superintendent of the station, gave a summary of the work at the station and the general condition of the crop in Wisconsin.

Mr. A. U. Chaney and B. H. Porter of New York City, and Mr. Charles Schlosser of Chicago, Ill., also spoke on the general condition of the crop in the whole country.

A resolution was seconded and carried that Mr. E. P. Arpin, Judge Gaynor and Mr. Clark Treat be put on the committee with the officers to formulate a plan whereby the cranberry station might be enlarged so that a bog for the exploitation of the commercial side of the industry could be carried on.

The meeting adjourned that the members might attend a meeting of the Wisconsin Cranberry Sales Co. J. W. FITCH, Secretary.

VALUE OF WEIGHTS AND MEASURES LEGISLATION TO THE CRANBERRY GROWER BY FRED P. DOWNING, CHIEF INSPECTOR OF WEIGHTS AND MEASURES.

The effective enforcement of the Wisconsin state law relating to weights and measures since its passage two years ago has exerted a most wholesome influence upon the manufacturing, industrial and business interest of our commonwealth. Aside from the value of this legislation in uplifting the moral tone of business it has been instrumental in saving the people of our state many thousands of dollars.

In considering the value of such legislation I desire to discuss it under two headings: First, its value to you as members of the great purchasing public of Wisconsin, and second, its value as applied to the particular industry in which you are engaged, that of the growing and marketing of cranberries.

The enforcement of this law was placed in the hands of the dairy and food commissioner who was made ex officio state superintendent of weights and measures. The law provided for the appointment of five additional dairy and food inspectors, a chief inspector of weights and measures, and a stenographer. It also specified that the cheese factory and creamery inspectors of the dairy and food commission could be delegated to act as sealers of weights and measures. This law provided for the appointment and equipment of city sealers in all towns having a population in excess of 5000. The force was to

be properly equipped with working standards and tools for the performance of its duties. The state superintendent of weights and measures was given charge of the state standards presented to Wisconsin by a resolution of Congress approved June 14, 1836, and he was authorized to purchase such additional standards as were deemed necessary.

The weights and measures act provided for the sale of all dry commodities by one of three methods, standard weight, standard dry measure, or numerical count, thus prohibiting the sale of dry commodities by the sack, basket, box, etc., without specifying definitely the weight or measure therein contained. It placed the manufacturers of milk bottles under bond to make bottles that were marked according to law and that held full measure. It provided for the sale of coal, coke and charcoal by weight. It specified that berry boxes must contain a quart, pint or half-pint dry measure. It established stringent penalties for the violation of any of its numerous provisions.

Soon after the law went into effect and the state department of weights and measures was organized, sealers were appointed and properly equipped. Nearly a year has now elapsed and the results of the first six months' inspection by both the state and local departments show conclusively the great necessity for such inspection. It was found that dealers were selling cranberries, hickory nuts and other dry commodities in liquid quarts which are approximately 15 per cent short of the dry quart that should have been used. In every section of the state grocers were using the so called bottomless measure with the diameter so narrow that it was impossible for it to hold the legal weight of the dry commodity. Oil measures were found heavily caked with oil, not having been cleaned for weeks or months. Measures were found with false bottoms, with the tops cut down, with the bottoms hammered up and with the sides dented. Manufacturers were found to be making measures short of their true capacity to effect a saving on the materials used. Wagon scales were found that had been in the ground for years and had never been repaired. Computing scales were found on the grocers' counters with incorrect charts. Many spring scales were tested that were so cheaply constructed that they did not weigh accurately even before being put into service. Weights were discovered that were worn, shipped, plugged or drilled. Some of these weights that were used in connection with the cheaper varieties of scales were simply cast at the foundry and only approximately approached the figure indicating the weight stamped on the outside thereof.

The above are a few of the conditions that have been found to exist in practically every city that has been inspected up to the present time.

Not only were dealers using incorrect weighing and measuring

appliances, but they were using them incorrectly. Certain trade customs had grown up that were sanctioned everywhere. Butchers were including the weight of long strips of paper with the meat sold. Grocers were including the weight of wooden trays and heavy paper bags. Fruit dealers were using boxes and baskets of every size and description. There was no definite or standard berry box or fruit container, with the result that people frequently were deceived and defrauded in the quantity purchased.

The results of the inspection of weights and measures for the first six months of the year 1912 have just been tabulated. Of the thirty-six cities required by law to have a sealer of weights and measures all but seven have now complied. The state department of weights and measures has made inspections in 272 cities and villages with a population less than 5000. The results of this inspection show that only 31.9 per cent of the dry measures, 75.0 per cent of the liquid measures, 82.4 per cent of the weights, 23.7 per cent of the linear measures and 48.6 per cent of the oil pumps are accurate. These figures are indeed appalling. They show that approximately one-third of the weighing and measuring appliances are incorrect. It is true that in many cases only a slight adjustment was necessary to make the weight, scale or measure an accurate instrument. Dealers have had no way of knowing whether their scales were accurate. A scale in balance does not necessarily weigh accurately. The only way a dealer has of finding whether or not his scale delivers correct weight is by having a sealer of weights and measures make the proper tests.

The report as given above is of interest and value to you only as members of the great purchasing public of this state.

I wish now to consider several sections of the law that relate more particularly to the line of work in which you are engaged. The state of Wisconsin is one of the group of three states that harvest the larger part of the cranberry crop of our country. In Wisconsin nearly the entire crop is sold in barrels. Several years ago this Association was instrumental in inducing the legislature to enact a law that established a standard bushel crate and a standard barrel for cranberries. No adequate provision was provided for the enforcement of this law. With but few slight changes it remains on the statute books today practically the same as originally passed.

I quote the law relating to the above standards for your information:

"The standard barrel for cranberries shall measure not less than twenty-five and one-quarter inches between the heads inside; the diameter of the head shall be sixteen and one-quarter inches, including the beveled edge; the outside bilge, or circumference, shall measure not less than fifty-eight and one-half inches, the thickness of the staves being four-tenths of an inch. But any barrel of differ-

ent form, but of the same interior capacity shall be considered a legal barrel."

"A bushel crate of cranberries or blueberries shall have an interior capacity of one bushel struck measure."

To the above should be added three new sections which read as follows:

"Every manufacturer of apple barrels or cranberry barrels shall stamp or brand his name with the letters "W. S." on the outside in plain and conspicuous letters, at least two inches in height, to indicate that such barrel is of the Wisconsin standard size of barrel."

"Any person, who, by himself or by his servant or agent or as the servant or agent of another shall sell apples, pears, cranberries, or other fruit in barrels of less capacity than is herein provided for, and any person, who, by himself, or by his servant or agent or, as the servant or agent of another shall stamp or brand any such barrel of less capacity than is herein prescribed, with the letters "W. S." shall be punished as provided in sub-section 10 of this section.

"All contracts for the sale of apples, pears, cranberries, or other fruits, potatoes or other vegetables, by the barrel or crate, unless it is otherwise expressly stipulated in writing shall be constructed to mean barrels or crates of the capacity prescribed in sub-sections four, six, seven, eight and nine of this section."

The new statutes provide for the proper branding of the standard barrel and prescribe stringent penalties for the sale of non-standard containers. Notwithstanding the fact that Wisconsin has had a standard barrel for cranberries for many years, the attention of the state department of weights and measures has been directed to the fact that many short barrels have been manufactured and sold in this state during that time. That such practices have been permitted is easily explained. The old law on weights and measures, while it had many excellent provisions, was practically a dead letter. No adequate provision for its proper enforcement was made. Furthermore it was almost impossible to secure a conviction as "intent" to defraud had to be proven. Now all this is changed. The dairy and food commission is rigidly enforcing the provisions of this act.

I have been told that certain growers have placed orders for the coming year for barrels with heads one-eighth of an inch short. This means that the barrel lacks several quarts of being standard size. Not only is the party who sells cranberries in such barrels dishonest and a violator of the law, but the cooper who manufactures the barrel is likewise a partner to the fraud. The state law makes it a misdemeanor for any one to sell a non-standard barrel in this state. If such barrels cannot be sold it naturally follows that they cannot be legally manufactured for the growers. It means that greater care will be exercised on the part of coopers to bring their barrels up to standard size.

I wish to commend the officers of this Association for the stand they have taken in securing the above legislation, and I suggest that if any of the members of this Association are found guilty of violations of the law that they be severely dealt with by the Association. Such members injure the good name of your Association and rigid action on your part will perhaps be a greater punishment to such parties than the imposition of a small fine.

My attention has been called to the fact that barrels cannot be made absolutely correct, that there must be some variation. We realize this and have provided for this by the establishment of a tolerance. If the barrel staves have not been properly dried they will shrink. Again, if they have been kiln dried and are exposed to a damp atmosphere they may expand. Then there is the human element of error. I have been told that old experienced coopers can make barrels that hold almost absolutely the correct capacity. There should not at the most be a variation greater than one pint, sometimes over and sometimes under the correct capacity. In making our regulation we have considered the above causes for discrepancies in capacity. Our regulation permits a variation of $1\frac{1}{2}$ per cent in capacity above or below, but the variation shall not be uniformly below on a test of twelve barrels taken at random. In the case of a bushel crate for cranberries a variation of 1 and one-third below or 2 and two-thirds above is allowed, but in no case shall the variation be uniformly below on a test of twelve crates taken at random.

A bushel of cranberries shall contain 35 lbs. It is customary to sell cranberries by stricken or level measure. If such stricken measure holds 35 lbs. it is a legal bushel. If it holds less sufficient berries must be added to bring the weight to 35 lbs. Our law now plainly states that if there is not a written agreement all commodities possessing a legal weight must be measured in terms of weight. A bushel of potatoes is 60 lbs., of apples, 50 lbs., of cranberries 35 lbs. While I do not appreciate that there is a wide discrepancy between the weight bushel and the volume bushel of cranberries, such as exists in the case of different varieties of apples, still there must be some variation and it might be well to be sure of the facts in the case before selling your berries.

It is impossible in the short time allotted me on this program to give you more than a mere outline of the work the state is trying to do in the enforcement of the weights and measures law, but I believe that with the splendid co-operation of this Association we need have no great fear in the future of any flagrant violations of honest or fair dealing among the cranberry growers of this state, and I wish to assure you that this department will use all the authority delegated to it by law to see that you are accorded a square deal in competing with

the growers of other states in so far as the same lies within our jurisdiction.

SECRETARY'S ADDRESS.

Mr. President, Ladies and Gentlemen:

I had the great pleasure in June of seeing some of the Cape Cod bogs about which we have heard so much, and it was certainly an inspiring sight. I was somewhat prepared as to how the vines would look, but the locations and the character of the whole country were something very beautiful and attractive to me. Indeed I am almost tempted to say that many people familiar with cranberry bogs in Wisconsin might drive by one of these bogs and not suppose they were a cranberry marsh. Set in the midst of the high land with a beautiful close at hand they do not suggest an idea of marsh bog except to one looking for it.

I was fortunate in seeing the splendid warehouse of the United Cape Cod Cranberry Co. at South Hansen, where last year 50,000 barrels were stored and sorted and I could not but wish that we had two such warehouses in Wisconsin and how it would simplify our marketing problems. I also saw some of their bogs, one of which had suffered severely from the June frosts. Indeed the evidences were quite plain in many bogs, one could see it even from the car windows and it looked to me that if those bogs were located in Wisconsin, there would have been no loss as sandèd and clean vines do not freeze in Wisconsin during the growing season.

They have one great advantage on many bogs and that is, the same lake is both reservoir and outlet, lying sometimes as much as five feet below the bog. The water is raised by pumps during frosty nights, and in the morning is let back into the pond, so that many of the bogs get fine drainage, because to keep them wet as we do here, would require constant or frequent pumping.

At South Hanson I also saw Mr. R. A. Eversen's bog. Mr. Everson is familiar to many of you as he spoke at our August meetings. Mr. Everson showed me a section of Howes on which one square rod not especially picked out for the thickest berries yielded two barrels and six quarts. A woman scooped a box in 37 seconds. Mr. Everson had discarded several of the fancy berries and reset to Early Blacks and Howes, and said that he thought he would plant Early Blacks exclusively on any new bog he might make.

I was much impressed with the sturdy appearance of the vines, that they seemed much better rooted than ours. It was no trouble to get at the ground and see the loose sand they were rooted in. Quite different from putting your hand into our western vines to get down to the ground. Here one digs through a mass of vines, mud, etc. I

am well satisfied that we have much to learn along this line. We can grow vines but we are growing roots, and roots are what we need to produce the berries in paying quantities.

It seemed to me that they had found out the best way to build a bog and all practically used the same system, while here in Wisconsin almost everyone has a different theory.

I had the pleasure of spending part of a day with Professor Franklin at the experiment station at Wareham. If you will remember, Mr. Franklin at one of our meetings, some years ago, told us that he thought the only way we could control the fruit worm (if at all), would be with water. He wished to be remembered to you all, and spoke of how much he had enjoyed our meeting. Their experiment station has twelve acres of vines and I was quite surprised to see on close examination, how thinly it was vined. It did not seem capable of producing 25 per cent of a crop, but Mr. Franklin assured me that he would not have them any thicker, that it was by drainage he kept them as they were, that he did not need to prune them and that they would produce the maximum crop.

Mr. Franklin was carrying out many interesting experiments, which were very practical in their scope, in fact all the work was in the nature of finding out whether it would pay and it seemed as if some way should be devised whereby Mr. Malde could do the same way in Wisconsin. This bog had only been touched a little in one season by the frost. The reservoir is a lake of about 300 acres which lies five feet below the vines. I was told that when they started the water on, the temperature would rise ten to fifteen degrees in a short time.

In conclusion I will say that I am very well satisfied that cranberries can be raised to compete with any region in Wisconsin.

J. W. FITCH, Secretary.

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Annual meetings on second Tuesdays of January and first Tuesday after the 12th of August of each year at places determined by ex. com.

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