I have received from various members at various times, various courtesies for which I sincerely thank you. We are all glad of the large meeting. I hope the Association will continue to grow and become a large body. And if I can find out anything that will assist my fellow members, I shall be glad to give you all the information that I can.

I believe that the lessening price of ginseng is due to the ignorance of many growers. They try to raise roots in a way inconsistent with what nature intended. The thing to do, I believe, is to get together all those who are interested and control the kind of seed to be raised and the prices for it. If you clip off the buds you are certain of getting a good price. A root that has been decapitated will be better to withstand blight than one with a large crop of seed.

Mr. Curtis:—We have tried to make arrangements to have five or six automobiles here at a little after four. These will not be enough to carry all of you, so those of you who will walk, had better go on and walk. We have arranged to go and visit some of the gardens this afternoon. Those persons who feel unable to walk, may go in the automobiles. The rest had better start now.

Mr. Zahl:—I move that we have an evening session. We will not get much done otherwise.
Motion seconded and carried.

Mr. Koehler:—I move that 8:00 o'clock be the time for the evening meeting. Motion seconded.

Mr. Zahl:—I would offer an amendment to that motion to make it 7:30. Amendment seconded, accepted by Mr. Koehler, and carried. Motion carried.
Meeting adjourned.

Evening meeting called to order by the President, Mr. Eberlein, at 7:45.

We have with us Professor L. R. Jones of the University of Wisconsin, and I am informed that he must leave tonight. I am sure that he has an interesting talk to give us.

Ginseng Diseases and their Remedies

(Professor L. R. Jones, Department of Plant Pathology, University of Wisconsin.)

I can be with you only a short time. I shall, therefore, use this opportunity simply to introduce the subject and explain the relation of our department in the Experiment Station to the ginseng disease investigations. It is one duty of the department of plant pathology of the State University to study Wisconsin plant diseases and advise as to their control so far as practicable. Requests for help
about ginseng diseases have recently been coming to the Experiment Station in considerable numbers. As you probably know, these maladies and their remedies are not well understood and we have thus far, had neither time nor opportunity at Madison for their critical study. We are glad to announce, therefore, that the United States Department of Agriculture, at the request of a Wisconsin congressman, has undertaken to investigate these more critically for the whole country and has placed our best authority on this field, Professor H. H. Whetzel of New York, in charge of this work. As representing him Mr. Rosenbaum has come to spend a short time here investigating conditions in Wisconsin ginseng gardens that Wisconsin growers may have the fuller benefit of this study and the advice which is to follow. It is, therefore, important that you not only learn from Mr. Rosenbaum all you can while he is here, but also that you send in for his examination, specimens of any diseases that are troublesome in your gardens that he may be fully advised as to the Wisconsin problems. Such specimens should be clean, dry, and are best wrapped in newspaper with leaves of the plant so spread out and separated by the folds of the paper that they partially dry out in transit. If packed with soil or wet moss they become badly matted or even decay before they arrive.

Since he is to tell you about ginseng diseases in detail I will now simply introduce this subject with a few statements as to the nature and causes of plant diseases in general.

The plant is a living thing as truly as the animal and with much the same needs. Like the animal it must have air, water and food; and to manufacture a part of this food it must have sunlight. If any of these things are lacking or out of proper proportion disease may result. Some of the ginseng diseases are of such origin, and when rightly understood such are to be controlled by improved methods of culture, fertilization, water supply, drainage or shading.

There is another class of diseases due to parasites, and while unfavorable conditions just mentioned may predispose the plants to these they are not the direct cause. Such parasitic organisms may be either animal or plant. The animal parasites of chief concern are the insects and worms. The plant parasites are either of two types, bacteria or fungi. Since the next speaker will refer to specific examples of ginseng diseases due to each of these I will simply show illustrative specimens on the apple and point out certain differences.

Here we have the common twig blight of the apple (specimen shown). This is caused by parasitic bacteria which are generally introduced through the blossom or wounds in the stem and then grow and multiply in the
sap and spread especially in the inner bark where they poison and kill the tissues. The destruction of the diseased tissues and general sanitary measures are required in this and most such bacterial diseases.

This same apple is also subject to a fungus disease, the cab, which shows itself as dark blotches on the leaves and fruit. This scab fungus is a sort of mold-like growth which produces an abundant crop of greenish black spores or seed bodies on the surface of such spots and these, when scattered over the surface of other healthy apple leaves and fruits, with favorable moisture and temperature, germinate and send a germ-tube or sprout through the underlying skin of the apple and so start new infections. This, and such fungus diseases generally, are best controlled by spraying the surface of the healthy plants with some fungicide, that is, a solution which will destroy these fungus spores and so prevent such infection.

In these introductory remarks the purpose has been to prepare you for two fundamental facts; first, that some understanding of the cause of each disease is necessary for the intelligent planning or use of remedial measures and, second, that in most cases such measures must precede rather than follow the serious developments of disease, i.e., the aim should be prevention rather than cure.

In closing I would again invite you to send specimens of diseased plants with inquiries to the Experiment Station at Madison or directly to Cornell University for the advancement of the present investigations and that we may secure the fuller practical benefits for the Wisconsin ginseng growers. I thank you you for your attention and yield the floor to our specialist from New York.

Mr. Eberlein:—In behalf of the Association, I wish to thank you, Professor Jones. We will notify you of the time and place of our next meeting.

Prof. Jones:—Thank you. I am sorry that I cannot stay longer this time.

Mr. Eberlein:—We have with us the assistant of Professor Whetzel who is doing such excellent work in behalf of ginseng growers, Mr. Rosenbaum.

Mr. Rosenbaum:—
Before I tell you anything about the diseases of ginseng, I want to say to you that Professor Whetzel is very sorry he could not attend the meeting himself. He is very busy and was unable to come.

Now, as I go along if I do not make myself clear to you, do not hesitate to ask questions.

I have talked about the diseases in the field today, and perhaps I may repeat some of these things tonight.

Most of the diseases of ginseng are caused by fungi. Fungi are plants just like ginseng is a plant. But the ginseng plants you can see with the naked eye, and the fungi you cannot. I will try to show you some tomorrow
through the microscope. These fungi produce their seeds much like ginseng produces its seeds. These seeds or spores spread the diseases in your garden. The seeds of the fungi are much more numerous than those of ginseng. There are, for example, thousands and thousands of the Alternaria Blight spores on a single diseased stem of ginseng.

Now, I have here on the table, specimens and photographs of the different diseases. You do not have all of them in your gardens just now, but you may have them sometime, and I have specimens here so that you may acquaint yourself with all of them. I will try to give my attention to the most important.

**Papery Leaf Spot.**

The Alternaria Blight is more common than any other ginseng disease in Wisconsin just now, but later you may get the others, and it is just as important to know about these as it is to know about the blight. The first disease which I want to discuss is called *papery leaf spot*. The difference between the papery leaf spot and the Alternaria blight is quite marked. The papery leaf spots appear only between the veins. In the case of blight the spot is not as transparent and has a rusty border. Leaves affected with papery leaf spot should not be removed. While there is any green part left in the leaf, it will still continue to manufacture food for your plant. If you remove the leaves from the top of your plants, no food will be made for it. Try the experiment yourself when you get home, by taking two dozen plants. From one dozen remove the leaves, and leave all the leaves on the other dozen. You will see when you dig the roots that those of the plants from which none of the leaves were removed weigh much more than the other dozen roots. The more leaves you have the more food will be manufactured for the plant. Now, a word or two as to the cause of papery leaf spot. No single cause can be assigned. Many causes may account for it; excessive dry weather may be one. In the case of excessive sunshine, more water will be evaporated and less left for the plant. The Root "rust" may also cause the spot. "Rust" destroys the little fibers of the root which absorb the moisture so that there is no way for the plant to obtain water. The leaves dry out in spots for want of water. In the case of the blight, the diseased spot in the leaf is full of the fungus. This keeps spreading and you must take the leaves off and burn them. In the papery leaf spot, on the other hand, no fungus is present and just as long as there is green coloring matter in these leaves, they will still continue to manufacture food for the plant.

**Fiber Rot, "Rust" or End Rot.**

I have visited about seventy-five gardens this summer, and I have gone into but one in which I have not found
the "rust," although several people claim that their gardens are free from it. I dug up a half dozen roots in Mr. Koehler's garden to see if I could find any rust there. I have not found any as yet, but feel pretty sure, that if I looked long enough I should have found some. This disease is due to a specific fungus that lives in the soil. Rust affects the roots directly while blight only affects them indirectly. Blighted plants grow again the next year if they do not suffer some from another attack of blight. Fiber rot or "end rot" attacks the roots directly injuring them and making them subject to attacks of other diseases also. The application of lime to the soil favors the development of the "rust." We have demonstrated in the State of New York, that this disease can be controlled by application of acid phosphate. If you have applied lime to your soil, you will have to apply more acid phosphate to counteract the lime. If you have not applied lime to your soil, acid phosphate at the rate of one thousand pounds per acre will probably control the disease.

Question: Is Tennessee phosphate rock the same thing?

Mr. Rosenbaum: I think it is, but I am not sure.

If your roots are badly rusted dig and dry them if they are large enough; if not it may pay to dip them in Bordeaux and replant. If you want to use the land again from which these rusty roots have been dug, I would advise you to treat the soil with formalin. Write me and I will tell you where to get this. If you get formalin (also sometimes called formaldehyde) at the drug store, they will charge you more than you will have to pay if you get it wholesale. It would be advisable for you ginseng growers to get together and buy it in bulk. It costs about ninety cents per gallon. Forty per cent strength is the strongest you can get. Dilute this 40 per cent formalin at the rate of one gallon of formalin to one hundred gallons of water and apply the diluted solution at the rate of one gallon per square foot of bed. It would be well for you all to take this down. Apply it with a sprinkling pot. A hose would be better if you can use one. Let one man spade up the soil while another applies the solution. It should be applied during the autumn or early spring. Wait at least two weeks before you plant any seeds or roots in the soil, respading several times. Formalin is a poisonous gas dissolved in water and it takes about two weeks for it to evaporate. In treating your land in this manner it will not only destroy the "rust" fungus, but it will also destroy any other fungi that may be present in the soil. In talking to ginseng growers, I have noticed that the majority of them claim that the soil that has grown one or two ginseng crops, cannot grow as good a crop again. If you will sterilize with formalin, the land should be just as good as when you started.
Question: You don't mean in the sense of a fertilizer

Mr. Rosenbaum: No. This acts as a fungicide. The soil will be just as free from disease producing fungi as when you started. If I were growing ginseng, I would use ordinary manure. Apply some manure for fertilizing, though it may not be necessary to do so every year.

Question: Does not the application of manure cause grub worms?

Mr. Rosenbaum: I do not know anything about bugs, I am not a bug man. If you have very badly rusted roots, first treat your soil with formalin, one gallon of the 40 per cent solution diluted with one hundred gallons per square foot. The next thing is to apply acid phosphate one or two thousand pounds to the acre. This is not all. If you intend to plant the same diseased roots again, I would advise that you dip them first into a solution of Bordeaux, 3-3-50, the same as you apply for blight, then reset the roots while wet. To sum up: First, you treat your land with formalin to kill the organisms that attack the roots; second, you have to put the soil in an acid condition by using acid phosphate. Then treat the diseased roots by dipping them in Bordeaux before replanting.

The best way to dip the roots is to have a tub and two baskets. Dig out the roots and put in one basket. Then dip them in the tub containing the Bordeaux, and while setting these out have the second basket in the Bordeaux.

Mr. Eberlein: I would like to ask if, by applying this formalin to the soil, when it requires one gallon to one hundred gallons of water, and then one gallon of this covers one square foot, it would not be cheaper to use new land?

Mr. Rosenbaum: I am simply telling you how to control the disease if you wish to use the old beds. If you think it is cheaper to work up new soil, move your plants, and do everything over again, that is another question.

Question: I did not quite understand the difference between formalin and formaldehyde.

Mr. Rosenbaum: These terms are used for exactly the same thing. If you call for formaldehyde at the drug store, they will charge you twice as much. I suppose that is because it has a longer name. But you say that you want forty per cent formalin, and they won't charge you as much, because they will think you must know something about it. (Formaldehyde is a gas, when dissolved in water formalin results.)

Question: I would like to ask if the ninety cents a gallon which you say is the cost, is in car load lots.

Mr. Rosenbaum: You have to get it in carboy lots if you want it at that price. (A carboy is a large glass bottle holding several gallons.)
Well, if we growers use this, we will have to get together and send for a lot to some wholesale druggist, and get it in large quantities.

Mr. Rosenbaum. I think you will get wanting to get about a carboy of this yourself before I finish talking, because it is used not only for rust, but for many other diseases. You may not use it all this year, but it will keep for four or five years.

But we would not want to buy it for five years ahead.

Mr. Rosenbaum: No, but there are other diseases that we are working on now, and the preliminary study of these indicates that we will use formalin also for these other diseases. I think that in three or four months from now we will be able to tell you more about it. But as you say, the thing for you now to do, if you only want to treat several hundred feet or so, is to unite, as some of our growers are doing, and buy the formalin together.

Question: If applied at the rate of one hundred to one, would the formalin injure the leaves?

Mr. Rosenbaum: You do not apply it to the leaves. This is a treatment for the soil after the roots are removed.

Well, I thought perhaps that if it was good for one thing it might be good for another.

Well, it might injure the leaves, I cannot tell you. I never tried it. I think that it would injure the leaves.

Question: What is the object in dipping the diseased roots in Bordeaux?

Mr. Rosenbaum: If some of the fungus remains on the roots after you have treated the soil, you are simply inoculating your soil again.

Question. Why not use the formalin directly on the root?

Mr. Rosenbaum: It may kill the root. If the solution is dilute enough it may work all right, but you see you would have to get a solution strong enough to kill the fungus and still weak enough not to injure the roots.

Mr. Zahl: To help this discussion, I will say that I sprinkled formalin very freely on my plants, and it did not hurt them. I used it just the same as Bordeaux and it controlled the blight.

Mr. Rosenbaum: Did you notice the weather conditions at that time? It may have been that the weather conditions were unfavorable for the blight.

Mr. Zahl. I do not remember about the weather. But I know that it was harmless to the foliage. I used it one to one hundred pounds.

Mr. Rosenbaum: I will try it out.
Question: Isn’t arsenate of lead used for diseases of plants?

Mr. Rosenbaum: Arsenate of lead is used for insects, but not for fungi which are plants.

Now, I wonder if you are familiar with fiber rot or end rot of seedlings? I will pass some specimens around which show some of the typical signs of this disease. It shows the successive stages of the disease. Here is a healthy seedling. I will pass this one around, and you can take your time about looking at the rest and studying them here on the table.

Mr. President, am I to have any time tomorrow? If so, I will arrange to show these more plainly to your members.

Mr. Eberlein: We will arrange to allow an hour and a half tomorrow. But give us all you can tonight because some of us cannot be here tomorrow.

**Alternaria Blight.**

Mr. Rosenbaum: I will talk about the Alternaria blight since some of you will not be here tomorrow. You understand, I cannot tell you all about it in the short time I have. I could talk for a long time and then not tell you all there is to know about it. We hope to have a bulletin out shortly, which will better help you to understand these diseases. I may repeat some of these things tomorrow when I can use the microscope. This disease appears very early in the spring. It attacks the stems of the plants first, though unless you look very closely for it, you will not see it on the stems. It is on the stems that the spores of the fungus are produced. These are carried to other ginseng plants. If an insect alights on a diseased stem, it will become covered with these minute spores which it will carry away to healthy plants. It may carry away five hundred or more spores and spread them on throughout the garden, until the whole garden is diseased. It spreads very easily, and the little spores cannot be seen with the naked eye.

Question: What is the appearance of the spores on the stem?

Mr. Rosenbaum: They produce a fuzzy or velvety appearance, making a long black spot on the stem. I have a specimen here. Perhaps you can see them. By handling this specimen, I have possibly five thousand spores on my hands. Now, I will have to change my suit before I go into your gardens lest I carry the fungus spores with me. These spores need moisture to germinate. The spores or seed will not grow without water. That is one reason we tell you to spray before the rain and not after. It is almost as bad as not to spray at all, if you cannot spray before the rain. The spores of the fungus germinate by sending out germ tubes or little branches. Some have
germinated here, but I doubt whether you can see on account of the light being poor. (Mr. Rosenbaum arranged a specimen under the microscope, and the members came up to examine it.)

After the spore or seed germinates, and this germ tube penetrates into the stem or leaf, no amount of spraying will kill it. It is after this germ tube enters the plant, three or four days later, that the spot appears on the leaf or the stem as the case may be. The germination goes on during rainy weather. Get your spraying mixtures on before the rains, because once the fungus gets into the leaf you cannot hope to control it. We visited a very badly diseased garden this afternoon. It was badly affected with Alternaria. I think it was the second garden we visited. (This was Mr. Chellis' garden.) The very first thing to do this fall—in such a case of Alternaria blight, it is not enough to begin in the spring to get rid of the disease but you must begin in the fall—the very first thing to do after the tops die off, is to break off all tops and stems, carry them out and burn them or scatter straw and burn them on the beds. In the fall when the plants have gone into a condition of rest, apply coppy sulfate five to six pounds in fifty gallons of water. Spray on the soil in order to kill any spores that remained on the ground. Be sure, in the spring to spray the ground with copper sulfate, then continue spraying before each rain with Bordeaux. Do not spray after the rain. Spray before.

Question: How are you going to know when it is going to rain?

Mr. Rosenbaum: That is a hard question to answer. The government puts out weather reports which show you approximately what the weather will be in your locality. You should learn how to use these weather reports to your advantage. These reports are sent out daily. In some places they are in the newspapers. Usually storms travel from west to east. If you study the maps you will soon learn when to expect a storm. I would advise you to begin studying them in the winter, then by summer or spring you will know about the game. If a storm, say, is in Idaho today, you can expect it here in twenty-four to thirty-six hours. Now, if you see according to your weather map that there is a storm in Idaho, you can feel pretty sure there will be a storm here soon. For example if I saw on a weather map today, that there was a storm in Idaho, I would expect it here late tomorrow afternoon or early the next morning. I would immediately take out my spraying machine and spray, covering stalks and stems and the upper side of the leaves, and the under side, too, although that may not be necessary, yet it will not affect the growth of the plant. It will not hurt the growth of your plant any, and it may help protect it some. The 3-3-50 Bordeaux will kill the spores and control the blight.
If you feel better about using 5-5-50, go ahead and use it. It will not hurt your plants if you test your Bordeaux, and if you use it right. I will show you how to test your Bordeaux tomorrow.

Question: Is it not better to use 5-5-50?

Mr. Rosenbaum: The 3-3-50 will kill the spores. After the spores are dead, if you feel better about using a stronger solution go ahead and do it. The 3-3-50 will kill the spores provided you put it on thoroughly.

Question: Does it kill the spores before they germinate?

Mr. Rosenbaum: Yes or when they are germinating. It will not kill the fungus after it has entered the plant. There isn’t anything remaining of the spore after it germinates but the empty hull. The spore is a seed just as much as the ginseng seed. After the seed of ginseng has produced a plant, you have only the hull left.

Question: That is the point in question. Will the application of Bordeaux kill the fungus that develops from the spore?

Mr. Rosenbaum: No. You can spray all you want to, and if you do not get the spore before it germinates, and enters your plant, you cannot kill its growth once it is in the leaf. After you spray, your Bordeaux will not wash off. You can use a scrubbing brush, and you will find out that you cannot rub off Bordeaux. You will see the light blue color again after it is dry. Pyrox is the same way. That is the reason we tell you to spray before each rain in order to destroy the spores before they germinate.

Question: What is the use of spraying again between each rain if the Bordeaux will not wash off?

Mr. Rosenbaum: The leaf of the plant may grow some between rains and you spray again to cover any new growth.

Question: What material ought we to use to spray with?

Mr. Rosenbaum: Bordeaux will control the blight. You have seen here in the first garden that we visited, and I have seen it in twenty gardens, so I know that it will control the blight where applied before the rains, covering the stems and the upper sides of the leaves. Where they were sprayed with Pyrox, some gardens had no blight; in others it was not checked.

Arsenate of lead acts as an insecticide. There is no necessity of adding it to Bordeaux to stop blight, because blight is caused by a plant not an insect.

Question: Isn’t Pyrox a proprietary article? I thought there was a secret formula for it.

Mr. Rosenbaum: Add Arsenate of lead to Bordeaux and you have Pyrox.

Question: How much Arsenate of lead?
Mr. Rosenbaum: Two pounds to fifty gallons of Bordeaux. It is not at all necessary, but if you will feel better about it, go ahead. In a crop like ginseng, it is a valuable crop as compared with potatoes. While it may not be practical to use Pyrox on potatoes, it may be on ginseng. If you can get Pyrox fresh, for it produces better results fresh, it is all right. If you cannot get it fresh, add two pounds of Arsenate of lead to fifty gallons of Bodreaux. I think that is all I will tell you tonight. Are there any questions you would like to ask?

Mr. Curtis: I would like to ask a question. A great many growers have sprayed with Bordeaux, and sprayed thoroughly, yet their gardens went down. Yet you say it will prevent the spore from germinating and will kill it. How do you account for it?

Mr. Rosenbaum: My dear Sir, did they spray before the rains? How thoroughly did they spray? I tell you, I do not call sprinkling, spraying. And the spray machine that most of you ginseng growers use, is not efficient.

Mr. Curtis: My garden, everybody is willing to admit was not in first class shape apparently. One other garden was sprayed with Bardeaux mixture, and was in fine shape. Do you think that was the entire reason for that being in good shape while others were not?

Mr. Rosenbaum: You mean, was that the only reason or the prime reason? Is it not partly because the gentleman who owns it, has practically a new garden? New land has less disease in it. Or is it because he sprayed thoroughly?

Mr. Curtis: Two years ago I had the pleasure of taking the gentlemen around. They were very much pleased with the condition of my garden at that time. They expressed decidedly that it was in as fine shape as any they had seen here. I felt reluctant to show my garden in the condition it was today. I appreciate the fact, however, that the only object we have is to solve difficulties and to learn how to remedy them. So I consented to show my garden as an example of a badly diseased garden.

Mr. Rosenbaum: Your garden is not in very bad condition. The roots are not badly affected. The thing for you to do is the three things I suggested before. First dig up your roots, treat soil with formalin, apply acid phosphate to your land. Examine your roots and if you find them badly affected with “rust,” dip them in Bordeaux before replanting.

Mr. Curtis: Was the “rust” pretty general all through my garden?

Mr. Rosenbaum: I should say, judging from the samples I have taken up and from the plants, that the disease is pretty well distributed.

Will the plants go down with “rust” just the same as with blight?
Mr. Rosenbaum: You mean the tops? It takes the fibres off and there is no way for the plants to take up moisture to feed the tops. In that way the tops are affected. They turn red early and may wilt. They usually do not die down however.

Mr. Weaver: Are lime and ashes injurious to the plants?

Mr. Rosenbaum: Not to the plants. However, it induces a condition of the soil favorable for the disease.

Mr. Weaver: If the Bordeaux is sprinkled over the plants, will the lime in it hurt the growth of the plants?

Mr. Rosenbaum: In that case the lime does not get to the roots. Bordeaux is only for the tops.

Mr. Eberlein: I have a large garden and if I waited until before I thought it was going to rain, I wouldn't be able to get half over my garden. So I set a time to spray and spray often. During a rainy season I spray oftener and I have good success that way. I have not any blight to speak of.

Mr. Eberlein: There are two things I would like a little information about. The purpose of using Bordeaux, as I understand, is to prevent the germination of these spores. You have not as yet touched upon the cause of the spores nor their origin. Can you tell us a little bit about where and how they originated?

Mr. Rosenbaum: You see first how they get on your leaves. They must get on the leaves before they produce injury. I will take up briefly the life history of this plant, that causes all the disease. It has a certain life cycle. It goes to sleep, and gets up, and it has another time to work. The summer time is its work time. The spores get upon the plant—they may be blown there by the wind, or carried there by insects, or carried in by your clothes as you pass through the garden. There are a great many ways that they may get there. The same way they may also get on the stem, and they do just as much injury on the stem. Where do they originate? It is thought they were brought in from the forest on diseased wild ginseng. Man began to bring the plants in from the forest, and when he brought the plants closer together, the disease became more noticeable. You would probably never have noticed it on a single plant in the forest. But when you bring the plants in close together, it spreads more easily from one to another, and then it is noticeable.

Mr. Eberlein: My other question is this. We know that the atmosphere and everything that we eat and breathe is alive with germs. We also know that if a person's health is not in good condition, he will be affected by these germs and by sickness. May be the disease will be tuberculosis. And unless he is physically strong enough to throw off the disease, he will be sick. Now, is it not true that a plant may be weak and thus subject to these
diseases? Is there any way to treat your plant, to make it strong enough to withstand the attack of these diseases?

Mr. Rosenbaum: While soil, shading and other cultural methods will influence the amount of disease in your garden, if you have blight spores and if certain conditions are favorable for the germination of the spores you are sure to have blight there. But as you said, cultural conditions may have much to do with diseases. Select seed from the healthiest plants, and select the healthiest seed heads. Then go through these, and select three or four of the best. In this way, while you will not get a plant entirely resistant to disease, it may be much more resistant than you have now. You growers should begin selection of seed by marking the seed heads, and then selecting the best seed from these seed heads.

Question: Is that the way you account for one plant whose stems are rank and unaffected, and other plants around it are affected, while this plant has no appearance of being affected. Is that the way you account for it?

Mr. Rosenbaum: It may be, and it may be also that the moisture conditions were not just right for the spores of the fungus to germinate there. I would select my seed from that plant. It must be that some condition makes that plant more vigorous than the others.

Mr. Curtis: I had an opportunity of visiting a garden in the north part of the state Saturday. Some of the plants were affected, while others were not affected at all. I wanted to find out the reason. I found that invariably the plants that were affected were planted with the bud of the plant quite deep in the ground. The unaffected plants were planted with the bud within an inch of the top of the ground. I believe that we plant our plants too low, or too deep. It is impossible for the plant to drink in the nitrogen and oxygen from the air which is necessary for plant life, when it is planted so low. I also believe that if the planting of ginseng continues, that we will have to make a study of the needs of the plant. If there is something lacking in the soil we should find out what it is and put it back. I believe that we will raise a healthy plant that will withstand the germs that are in the soil, just as a vigorous healthy man can breathe the germs of tuberculosis and not be affected by the disease. But just the minute you stop nourishing the system through the stomach, or the nourishment of the plant through its fibers and through its stem, just that minute you create an unhealthy plant. I bring this up for the sake of argument or suggestions along that line. I do not claim to know about this, but from a common sense standpoint, I believe that vegetable life is nourished—perhaps along different lines, but still just the same as human life is nourished, and if you do not give it the nourishment that the plants require, then they are susceptible to sickness; and that is proven to my
satisfaction in the gardens we have visited today. In the first garden there was no apparent disease, while in my garden—which was the last garden those in the automobiles visited—which was treated in exactly the same manner as the first garden, there was very much disease. That confirms in my opinion that there is something that has been extracted from the soil or some condition of the plant that needs attention. And I understand that it is the nature of the plant to go deeper into the ground, that the fibers pull themselves into the ground. None of the roots that were planted in this garden, were planted originally five or six inches below the ground, but they have drawn themselves down. Now, a plant that is that deep is not going to be as healthy and vigorous as it is up where that bud can get the sun. I believe that there is something in that worth consideration, and before we get through with this convention, I want to suggest that we, as an organization, employ some expert to make a study of this business and by testing the soil and expert examinations and investigations, give us something from time to time that will be of benefit to us.

There was some gentleman from my garden collected a bouquet of leaves and stems and would be very glad to have you examine those and tell the gentleman just what was the matter.

Dr. Card: It must be true that our most vigorous plants are raised from the best seed. Now, the question is where, and how to get the seed that will raise the vigorous plants. The plants from seed raised from old plants—not less than seven years old—produce better seed than younger plants do.

Mr. Rosenbaum: I should say from this hasty examination that these leaves have the blight spot, while all the rest are the result of the disease in the root which causes these leaves to turn the color they are now.

Question: Do you claim that the red in those leaves is due to disease?

Mr. Rosenbaum: It may be due to exposing leaves to an excess of sunlight, or it may be due to lack of moisture which disturbs the physiological functions of the plant. When these functions are disturbed they cause the peculiar colorations. I have had a large number of specimens at the laboratory this year. Half of that number had trouble with the root, so we advise you to send your whole plant unless you are sure the trouble lies elsewhere.

Mr. Zahl: I have found plants that were perfectly healthy in an open plane where a slashing had been burned, and where there had been a superabundance of shade. And when this shade had been taken away, the leaves became red. I believe that a superabundance of sun will cause the leaves to turn red.

Mr. Eberlein:—The program as prepared, calls for
various articles. I think we had better take them up in the morning and also allow Mr. Rosenbaum time to finish his article.

**Mr. Zahl:**—I move that we adjourn until tomorrow morning at 9.00 o'clock.

Motion seconded and carried.

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**Thursday Morning Session**

Meeting called to order by the President at 9:05.

**Mr. Eberlein:**—I believe it would be well at this time to change the order of our program a little and have the election of officers. The officers of the Association hold for one year, and in consequence of this fact, there must be election of officers at this time. There shall be elected, President, Vice President, Secretary-Treasurer, and three members of the Executive Committee. The other members are appointed. The Chair will appoint as tellers, Mr. LeMieux and Mr. Bender.

Result of first informal ballot for President:

Mr. Eberlein .............. 19 | Dr. Burns .............. 3
Mr. Neefe .............. 1 | Mr. Koehler .............. 2
Mr. Zahl .............. 1

**Mr. Neefe:**—I move that the first informal ballot be declared formal.

Motion seconded and carried.

**Mr. Loehr:**—I move that the secretary be instructed to cast a ballot in favor of all the old officers except the Secretary-Treasurer.

Motion seconded and carried.

The Secretary was so instructed and cast such ballot.

**Mr. Eberlein:**—The next in order is the informal ballot for the election of a secretary for the ensuing year.

**Mr. Loope:**—According to the report of the Secretary, the question really hinges on the question of dogs, and perhaps the secretary would object to take so many dogs on his hands. That is the only trouble that I can see. The main question would be, what would become of the dogs if we do not elect Mr. Krier? If you should elect me, I would take the dogs and drown them the first thing.

We have plenty of material here. Mr. Steeps of Rice Lake, has plenty of ability for this position.

**Mr. Eberlein:**—It is up to the Convention to do as it pleases. It would be hard to pass the dogs to another man.

**Member:**—Do the dogs go with the secretaryship? Can we not leave them where they are?

**Mr. Zahl:**—Is there anything in the Constitution and By-Laws or any other place that necessitates the secretary to have charge of the dogs? Does one man have to have them all?