ground that the lower your nursery stock is in price, the better for the grower. If you have a lot of it for sale, you will induce a new man to come into the field. If it does not pay you to sell nursery stock, you will sell dry root.

Mr. Pierce: If nursery stock was extremely high, there is not many people who would venture to invest very much in it. The cost of getting started would scare them out.

Dr. McMaster: There is not everybody that is adapted to growing ginseng. It requires a lot of patience to grow the root. You can't market under six years.

Mr. Holly: I wonder how many members have sold nursery stock this year.

Dr. McMaster: I sold 40,000 seed.

Mr. LoSee: I sold 1,000 two year olds.

Mrs. F. W. Ingalsbe, who who was to give the paper on the subject of "The Lady Ginseng Grower, and What She Has Already Accomplished," being absent, the discussion of the subject was left open.

Mr. Roof: I have corresponded somewhat with some lady ginseng growers, and have asked them to write us giving us some of the ideas that would suggest themselves to them with reference to their part in the industry, but so far have failed to get anything.

Dr. McMaster: I remember last year our President Roof told about the largest growers in Ohio being two ladies, and that they made a success of it.

Mr. Goodspeed: I understand their garden did not do well the last year, and now they are moving it to the woods.

Meeting adjourned until 1:00 p. m.

Meeting called to order, Dr. McMaster in the chair.

Supplementary report of the membership committee read.

Moved and seconded that the names read be admitted to membership by vote. Motion carried.

"Pests and Enemies of Ginseng and Remedies therefor and specialization in growing of crops in general." Dr. J. W. Beal, East Lansing.

The subject was chosen by some member of the association, and not of my own choice. (Paper.)

For forty years or more the professors of agricultural and horticulture in our agricultural college, and I think in all similar institutions in this country, have advocated what is called mixed husbandry, instead of advising farmers to devote all their capital and energy to growing one crop or one kind of produce to sell from the

farm. Here are some of the reasons for this advice:

Manure is economized, as crops do not all feed alike; the fertility of the soil is better and more economically preserved; weeds are more easily controlled; it enables a person to distribute his labor more evenly throughout the year; it gives a proportion of grain for feed, and course straw for litter; crops in alteration are less liable to attacks of fungi and insects. When fields are occasionally cultivated, moles are less likely to become troublesome.

If all the eggs are put in one basket, and that basket takes a fall, where will the owner look for revenues?

One objection can be made to the production to many kinds, of crops or animals by every man, viz., very few persons have the ability to carry on well so many kinds of business. Perhaps a compromise between the extremes of one thing and a large number of things is about right. Let the producer engage in a few lines of work only in which he can succeed best; thereby enabling him to become proficient in a few things, and not a failure in many things.

While at South Frankfort last summer, I observed VanDeman & Co. had dug a trench about their plat of ginseng, as I remember it to keep the roots of wild plants from making inroads on the sacred rights of the ginseng. In the botonic garden at the college that I manage, for a long time we were annoyed by the advent of quack grass and moles, which came in from the large campus surrounding. I tried lumber, which was costly and soon decayed. Next I dug a narrow trench to the depth of 18 inches or more, one bank of which was gently sloping to one side, and on this smooth side plastered an inch to an inch and a half of cement, which soon hardened so the trench could be filled. The two enemies, mentioned above, stopped then and there on their own side of the cement. Any one wishing to use trees to shade his yard of ginseng in place of lattice work, could stave off the effect of tree roots by digging a trench three feet deep, and see that the bottom contained only infertile soil, which might discourage the tree roots from digging under the cement for good feeding ground.

To scare thieves at Frankfort, the firm named turned loose at night two lively and noisy dogs; besides, adjoining the garden was a small house in which one of the proprietors or a trusty man slept and watched all night.

The shading at this place, as many of you know, consisted of seven-eighths cedar strips four inches wide extending north and south, placed two inches apart, thus shading two-thirds of the surface. This seemed to work so well that the proprietors were going to experiment on exposing wider strips to the light. From what

I know of plant growth, I think it would require more shade for ginseng, the farther south we go, especially in places some distance from a large lake.

Ginseng is a delicate, thin-leaved plant, not so easy to grow with success as potatoes, corn and beans. I have often wondered why so many grow ginseng with success, but I learned the explanation at your meeting last winter. Those successfully engaged in the work are unusually alert and painstaking. In sagacity they surpass most people who engage in growing fruits, vegetables, pigs, chickens or cattle—all combined on the same farm.

Plants may be said to be diseased when they do not thrive on account of having too much water or too little, too much light or too little, on account of a severe wind or unsuitable fertilizers, and for several other causes. No special remedies need be prescribed for such things. Cucumbers, tomatoes, beans, cabbages, are often damaged or destroyed by bacteria, and the plants die quickly. You may be familiar with the cucumber wilt. The remedy is to pull up vines as soon as they show wilt, and destroy them. Plant for a few years in places remote from where the wilt has existed. No spraying is effectual. In case of the fruit and leaves of beans, no spraying is of any use; save seeds from healthy plants and plant in a new place. In cases of beans, the disease passes from farm to farm in diseased seed.

As all the older persons present know, when apples are first grown in a new country, they are fair and the trees clean and healthy, but by degrees the larger orchards and the smaller orchards alike harbor apple scab, black rot, codling moth, tree borers, and many other enemies. So in growing any crop of garden, field or orchard, or ginseng, we are led to expect a continued increase of fungus foes and other enemies, as greater numbers of persons engage in the business.

You need no introduction to fungus enemies—minute plants which are parasitic, tramp-like, sponging their living on your favorite pet, ginseng.

Now, a word about remedies may interest you. Of hundreds of inquiries that reach me every year regarding weeds and plant diseases, two questions never fail to come with the specimen: viz., "What is it and how can I easiest get rid of it."

Bordeaux is the most famous, and so far, usually the cheapest and most efficient fungicide yet discovered, and is extensively used in many countries from Maine to California, Europe, New Zealand, and Australia. Although a favorite remedy, it is not an unmixed good, even when well prepared and well applied. Careful observa-

tions by many experts have detected more or less injury to plants which have been sprayed—plants in great variety from the hardy apple tree growing in sunshine to the delicate shade-loving ginseng. Injured leaves show irregular dead spots, more or less scattered about after spraying with bordeaux. This injury, especially of apples, is known as "Spray injury," or "Bordeaux Scald," "Bordeaux Burning," "Spray Russetting," "Cork Russetting," "Yellow Leaf."

A recent bulletin, No. 287, prepared by Professor U. P. Hedrick, of the Experimental Station at Geneva, N. Y., speaking of apples, says, "Use less copper sulphate; give the 3-3-50 formula for bordeaux mixture a thorough trial; spray in moderation; spray to cover the foliage and fruit with a thin film and yet not have the trees drip heavily; use the remedy only in dry weather or when plants are dry if possible; use equal amounts of lime and copper sulphate." The formula means three pounds of copper sulphate, 3 pounds of lime to 50 gallons of water, which is weaker than formerly recommended. Bordeaux mixture is made in this way: Suspend the copper sulphate in a cloth sack in a cask of water until it dissolves. Slack stone lime in water, straining it through a brass wire sieve, about forty wires to the inch. The solution of copper sulphate and milk of lime are mixed and well stirred. All the water used for dissolving copper sulphate and slacking lime is counted in the mixture which ultimately is to consist of 3 pounds copper sulphate, 3 pounds fresh stone lime, 50 gallons water, or in these proportions.

Bordeaux is acid, the lime used neutralizes the acid, till the combination is alkaline. Whatever nozzle and pump are used, the pressure must be high enough to make a continuous fine mist and be moved along fast enough to avoid the falling of drops of the liquid.

The Vermoral nozzles have been considered the standard for excellence. Experts at the college this summer think a new nozzle called MISTY or the MISTY, JR., are better than the Vermorel. Here are circulars of the Gould Company, corner Ohio and Franklin Sts., Chicago, Ill., treating of spraying apparatus, and here are copies of Special Bulletin 37 by L. R. Taft, of the Agricultural College, and here are samples of the best kinds of nozzles for spraying, and here on the wall is the chart shown last year illustrating diseases of ginseng.

Dr. Beal: Nematoids have been very injurious among certain gardens in New Jersey. As a remedy they have used about 175 bushels of slack lime to the acre.

Mr. Voorhies: Would ashes have the same effect?

Dr. Beal: I can't tell you.

Dr. Latimer: How do they apply the lime?

Dr. Beal: Put on the ground and plow under. Use slacked lime.

Mr. Goodspeed: I think you will find that nematois will increase quite rapidly, and an increase of two or three years will stop growth entirely. We get that disease in the old sections of the counrty more than in Michigan. I know of no remedy only to dry the root and start in a new place. It is a disease that is very readily recognized. Our experience is that sawdust does not retard the disease at all.

Mr. Pierce: Would it be safe to set ginseng roots in the ground after that preparation of lime has been put on ?

Dr. Beal: No, they recommend to go to another place.

Dr. McMaster: I will say we found some nematoids in our old garden while digging this year. They were in beds from made ground that had been filled in three or four feet with old plaster, and wherever that old plaster was, the nematoids were thick, and that plaster had plenty of lime in it.

Mr. Twiner: We have used lime every year, and we have never made new beds unless we gave them first a coat of lime and spaded it in.

Dr. McMaster: I would like to inquire of Mr. Goodspeed if it effects the price.

Mr. Goodspeed: It is very rare you get it upon the body of the root. It comes on the fibers and does no damage whatever to the root. You could not tell, after the root was dried, whether it was effected by that or not.

Mr. Luther: I would like to ask what remedy to use for rust.

Dr. Beal: Do you refer to alternaria on the roots? I cannot tell you. I don't know much about it. I think Mr. Roof will explain alternaria more fully than I can, if he will do it.

Mr. Roof: To distinguish alternaria: The first thing you would discover would be perhaps a brownish spot on the leaf. It might possibly start on the edge of the leaf and creep toward the center, but we find ordinarily it begins in a spot and that spot soon becomes transparent, from the sucking out of the juices of the leaf by the fungi. You hold it up to the light and you see simply a hole, examine it carefully and you find there is a little film.

Dr. Beal: If you perceive this in the early stages, you can begin your spraying.

Mr. Roof: Yes. There is a difference in the starting of alternaria upon the stalks and upon the seed heads. If alternaria attacks your seed head or stalk either, they both turn a sort of rust color. If it attacks your seed head ,you see rust spot upon the seed or head. You may look for blighted seed. In the case of the stalk,

if that should be affected with alternaria, it turns a sort of rust color and following that you either find a rotten spot or a dried up portion of stock. It very often opens up a hole in the stalk and then crawls up or down from where it is attacked, although I have seen stalks that were so dried that there was simply a film on one side where the outer skin of the stalk remained green and sufficient sap had been carried up through that to maintain green leaves, but, of course, could not produce any growth in that condition.

Dr. Beal: Any one that is looking after disease must train his eyes to see these points.

Mr. Goodspeed: I would like to ask Dr. Beal if he knows anything of the diseases we call rust affecting the skin of the plant.

Dr. Beal: I do not.

Mr. Goodspeed: It is something like potato scab.

Dr. Beal: On your young plants?

Mr. Goodspeed: Not especially young plants.

Dr. Beal: Have you had Prof. Whetzel look that up?

Mr. Goodspeed: We have both been looking it up. The only remedy we can hit upon is to take the plants and move to a new section. Sometimes they will recover by taking up and setting in new soil.

Mr. Roof: I had just a little experience. I will say that it has been my opinion from observation that it is some bug. Where I have found that rust, I find that it is not communicated to other roots in my case and, further, I have taken up roots that were rusted and transferred to another bed and the rust has left them.

Dr. Beal: Mr. Goodspeed, has that been extensive enough to cause any trouble?

Mr. Goodspeed: It seems to be locally in different sections. It is not wide spread, but I know of two or three gardens which it has got into bad. That disease practically spoils the root for market. There is a little in Michigan and some in New York, but I notice it comes more largely from sandy soil. Nearly every specimen I have comes from sandy soil. I had one hundred pounds shipped to me from Minnesota and not a root but was affected.

Mr. Ferris: On the matter of nematoid on the roots, I would like to ask those who have had it, would it not be better to throw away the roots or destroy them?

Dr. Beal: I would, most certainly.

Mr. Goodspeed: In that connection I would say that if you have a considerable amount of them, isolate them until they get their growth and dry and market them, but keep these roots entirely away from your garden. If you can afford it, the better way is to

destroy them at once, because that pest is certainly gaining.

We have handled this fall something like 175 different crops of green root, coming to us from Wisconsin and Missouri, and I would be safe to say that the disease is present in fully 50 per cent. of the crops. Some crops will have it on every root.

Mr. Cook: Will the disease in time advance to the place where it destroys the root? You said the presence of the disease did not injure the root for market. If that is the case, why pay any attention to it?

Mr. Goodspeed: I said a moment ago that it would increase until it stopped the growth. It destroys the life of the fiber roots and their ability to feed the plant. The fiber roots begin to die first and all means of sustenance is taken away from the plant, while you have the body of the plant there that can be turned into dried root and something realized out of it.

Mr. Pierce: Has any one had any trouble with soft rot of the roots? That is the fleshy part decaying entirely? I have had some trouble, but not to any great extent, and I would like to know if any one else has had any experience.

Dr. Beal: The only remedy is to get it out as soon as you can.

Mr. Goodspeed: I would dig it right out and burn it and look out for the soil.

Mr. Murphy: I have had a little trouble with the root rotting, and I have noticed it most when wet. I laid it to an over-supply of water in my garden.

Dr. McMaster: It is a disease that spreads and the way to get rid of it is to dig out that plant.

Mr. Goodspeed: If you wish to determine difinitely whether you have soft rot or not, you can determine by cutting the ginseng plant just below the bud lengthwise and if you find a little red spot, that indicates the disease. This is a root disease.

Mr. Pierce: Is this not more ruleable among aged and infirm plants, that is old woods plants? I find it so in our garden.

Dr. McMaster: I think that is so.

Mr. Holly: I found it among some of my three year olds this year.

Mr. Goodspeed: Ginseng, in its natural element, is a long-lived plant. It comes to a point of maturity in five or six years. If you leave it in the garden after that, it begins to decay. It is not an uncommon thing for a whole crop to take it into its head to disappear without any apparent disease.

Mr. Ketcham: It seems strange to me there should be so much disease with plants grown in a garden. Now I have run the woods

and dug many thousands of ginseng plants and I must say that I don't remember of having found a diseased ginseng root from the woods. It looks to me as though most of these diseases come from too much preparation of ground or something in the ground where we put our gardens. I use leaf mold and the fine dirt beneath the leaves and I must say I have never seen any disease of any kind in my garden. No rot and no alteranria. My ground is good rich sand, with clay two feet from the top of the ground.

Mr. Goodspeed: All that I can say is that Mr. Ketcham has been unusually fortunate.

Dr. Beal: Prof. Whetzel claims he found alternaria in the woods.

Mr. Horling: I have found several specimens. I found a little patch of heavy clay, and found not less than seven or eight that were from one-third to one-half rotted in the woods.

"Drying and Shipping Direct to China and Selling Dry Ginseng in this Country"—William G. Voorhies, South Frankfort.

Mr. Voorhies: I spoke about that some time ago, and have nothing more to add.

Dr. McMaster: You spoke of shipping direct to China.

Mr. Voorhies: I have not sold anything to amount to anything, so I am not posted on that.

Discussion opened by Mr. Brown, of the Muskegon Ginseng Co.

Mr. Brown: I did not know until today that I was on for discussion, so I am wholly unprepared to say anything in regard to it.

Mr. Goodspeed: You can't dry wet roots under four weeks. We spread our root out on a large floor until wilted, then we have a room where we hold the temperature at 60 degrees. It is put on racks in that room and the last three or four days the temperature can be run up to 120 degrees.

Mr. Ferris: How about washing it?

Mr. Goodspeed: That depends upon the demand of the Chinese. It is hard telling you anything that will hold. The Japanese are very sure to follow us. If we wash our root white this year, the Japanese next crop is washed just as near like ours as they can, then the people handling American root in China will say, "Give us some other kind, because the Chinaman is prejudiced and he cannot tell them apart by their looks." Consequently, you see if the Japanese root was exactly the color of American root, American root would go on the market at a disadvantage. We often get orders for roots running twenty roots to the pound, and then we get or-