ARTICLE IX.—EXPERIMENTS WITH SMALL FRUITS IN 1891.

(1.) COMPARATIVE TESTS OF VARIETIES.

The season of 1891 was very unfavorable for the testing of fruits, as nearly every variety was injured by frost. For this reason no satisfactory comparisons could be made as to season of ripening and productiveness. In the notes on varieties none but those of recent origin are mentioned except in the lists of approved sorts, as there is nothing new to add to what has been said in previous reports. It has been the custom in the past to mention those varieties only that have been offered for sale, but this plan has been departed from to some extent, and it is proposed in the future to give illustrations of the most approved sorts, whether they have been introduced or not.

STRAWBERRIES.

Two severe frosts, on May 5th and 17th, injured the strawberry blossoms to such an extent, on the Station grounds, that no satisfactory report can be given of the varieties on trial. Some were injured more than others, as shown by the relative quantities of fruit produced by the different varieties.

The varieties with perfect flowers suffered more than pistillates, Parker Earle and Enhance being apparent exceptions. It seems to be the rule, however, that staminate flowered sorts are comparatively tender. Nearly all the blossoms that were open were killed on the 17th, also many that were not yet open. The blossoms of some varieties are
easily killed before the buds open; hence there seem to be essential differences as to hardiness of varieties; but relative time of blooming is also a factor to be considered, nor must comparative fruitfulness be overlooked. In general, the varieties that give the largest crops in seasons when there is no frost also produce comparatively good crops in frosty seasons. As a rule, pistillate varieties are more prolific than staminate, and being more hardy as well those of the latter class are decidedly at a disadvantage, especially in frosty seasons, and in fact under adverse conditions of whatever character.

NOTES ON VARIETIES.

The following varieties have been tested for a sufficient length of time to warrant recommending them as among the best for general cultivation: Haverland, Crescent, Warfield, Bubach. Gandy, Pearl and Miner may be added for pollenizers.

NEW VARIETIES.

Bessie (imperfect). This variety possesses many good qualities, although not remarkable in any particular. The plants are healthy, vigorous, and quite productive. The berries are about the same size as the Crescent, and rather more regular in outline. Its chief merit seems to be in its shipping qualities, being unusually firm. It escaped the frost better than most varieties, but was perhaps rather favored in point of locality. It seems to be worthy of further trial.

Brunette (perfect). A very good variety, although not remarkable in any way, except in flavor, in which characteristic it excels. It is equal to Prince of Berries in quality, and seems to be superior to that variety in vigor of plant and productiveness. It is a promising variety for the amateur, and for those who place quality above all other characteristics.

Barton's Eclipse (imperfect). See plate 1. Resembles the Sharpless in foliage and Haverland in fruit, but averages rather larger. It was injured comparatively little by the frost, and gave a fair crop of fruit. This seems to be a variety of considerable merit, although it is not generally known, nor widely disseminated. It is worthy the attention of commercial fruit growers.

Bender Wood (perfect). Said to be very early, but owing to the fact that it suffered considerably from the frost, its comparative earliness could not be satisfactorily determined. The plants are vigorous and productive, and the berries are of good size, but rather soft. It is deserving of extended trial.

Dayton (perfect). On the Station grounds this variety was much injured by frost, and gave but little fruit, but it was seen on the grounds of the originator, where it was yielding a satisfactory crop. It is said to be about a week earlier than the Crescent, but owing to the frost nothing could be learned on this point from our trial at the Station. Plants very vigorous, free from disease, and quite productive; berries medium to large, conical, often flattened and sometimes slightly coekscombed, but
usually quite regular in outline; color, crimson; quality, good. Further trial is needed to determine the value of this variety, but it must be ranked as very promising.

**Edgar Queen** (imperfect). Our plants were mixed, but the variety that is supposed to be the true one has somewhat the same characteristic as the Haverland, and will no doubt prove to be an acquisition.

**Enhance** (perfect). This was one of the perfect flowered varieties that gave a good crop in spite of the frost. As claimed by Mr. Young, the originator, hardiness is one of its strong points. It seems to be nearly equal to the pistillate varieties in this respect.

The Enhance has been on trial at the Station a sufficient length of time to warrant the assertion that it has decided merits as a pollinizer and market variety. The plants are very vigorous and almost perfectly healthy, and but little inferior to the best pistillate sorts in productiveness. It is strictly a market sort, however, as it is too acid and ill-shaped to suit amateurs. Market growers generally, ought to give it a trial.

**Farnworth** (perfect). This is quite the opposite of the Enhance in most particulars. The plants do not make a vigorous growth and are only moderately productive, but the fruit is of excellent quality. It is not excelled as a variety for the home garden.

**Greenville** (imperfect). See plate II. This is a strong competitor of the Bubach, and indeed bears some resemblance to that variety. The plants are a shade lighter in color than the Bubach, make a stronger growth, and are quite as productive. The berries average a little smaller than Bubach, but are more uniform in size and regular in outline, and of firmer texture. It seems probable that the Greenville will have the important advantage over the Bubach of being a better shipper. Not introduced.

**Great Pacific** (imperfect). On fall-set plants this variety gave some very fine berries, but on one year-old plants in a matted row, the berries were inferior in size and appearance. It can hardly take a place along with standard varieties.

**Ivanhoe** (perfect). A beautiful berry of good quality. Plant healthy and moderately vigorous; quite productive. Altogether a promising variety.

**Lovett’s Early** (perfect). Plant vigorous, healthy and quite productive; berries resemble Haverland in shape, but are darker in color. We were not able to make satisfactory comparisons with other varieties as to earliness, on account of the damage done by the frost, but in other respects it seems to compare favorably with the recognized standards. The claims made for it seem not to be overdrawn, and it will probably take high rank among the leading varieties.

**Lady Rusk** (imperfect). Not satisfactory as to growth. The plants are quite subject to rust, and appear to be unable to carry the crop of fruit that sets. Many unfavorable reports are heard concerning it.

**Muskwagum** (perfect). This variety has been on trial several seasons, but is not introduced. It appears to have no serious faults, and is believed to be an acquisition of great merit. The plants are healthy, vigorous and productive, while the berries are uniform in size, large and attractive. Season, medium to late.

**Michel’s Early** (perfect). Known also as Osceola and Ella. The claims as to earliness of this variety seem to be substantially true, which makes it valuable for sections where earliness is the most important consideration, but it appears to have met with disfavor at the North because of its small size. It cannot become a general favorite, and growers in this State would do well to plant it sparingly, as it comes in competition with southern berries at a time when prices rule low.

**Parker Earle** (perfect.) Withstood the frost almost as well as the pistillate sorts. The Parker Earle has received commendations from nearly all sections of the country,
and, judging from its behavior here, these words of praise are well deserved. It seems to have no faults, unless it may be inc­ med to overbear, but the plants are so vigorous and healthy that they are able to produce large crops. The berries are not large, but uniform in size, and make a good appearance in baskets. It would be well adapted to hill culture, as the plants throw out but few runners.

*Shuster’s Gem* (imperfect). This seemed to suffer more from frost than most pistillate varieties, and in consequence did not give as heavy a crop as in former seasons. It is, however, a very promising market variety, but it may be too soft for long shipments.

*Steven* (perfect). The introducer claims that this is the earliest of all, but as the first blossoms were taken by frost a fair comparison could not be made. It was one of the first to ripen, however, and no doubt it will compare favorably in earliness with Michell’s Early and Covel, but in other respects it is decidedly inferior to these varieties. The plants are weak in growth and succumb quickly to the rust. The plants set in the spring of 1890 made a weak growth, and nearly all died from the effects of the rust the present season. It is hardly worthy of further trial.

*Van Deman* (perfect). A good grower, but foliage somewhat affected by rust; productive; berry conical, medium size, uniform, bright and attractive, firm. This promises to be a good shipping variety because of its firmness, and seems to be sufficiently productive for profit. Not introduced.

**RASPBERRIES.**

The varieties most suitable for general planting are: Gregg, Ohio, Hilborn, Palmer, Turner, Cuthbert, Brandywine and Shaffer.

**NEW VARIETIES.**

*Cromwell.* Fruited here but one season, but appears to be a promising variety of the Doolittle type. Plants rather low and bushy; berry of fair size and good color, but rather acid. Appears to be worthy of further trial.

*Kansas.* Fruited here one season only. Plants have made a fair growth, but not equal to the Gregg. The berries are fully as large as the Gregg, black and handsome in appearance, and ripen some days earlier. It appears to be a very promising variety.

*Lovett.* One season’s fruiting does not enable us to determine comparative earliness, but this variety appears to be of about the same season as Souhegan, or possibly a little later. The plants are quite vigorous and productive; fruit about the same in size as the Gregg, with less bloom and of better quality. Altogether very promising.

*Muskingum.* Similar to Shaffer, but the berries are smaller and firmer. Very desirable.

*Royal Church.* Plants vigorous and productive; berries large, dark crimson, moderately firm and of excellent quality. A very promising variety.

*Smith’s Prolific.* This has been on trial two seasons, but the plants have been attacked by the orange rust so seriously that they have produced almost no fruit, and are nearly dead.

*Thompson’s Early Prolific.* The plants do not make a strong growth, and are only moderately productive; berries medium size, bright crimson and quite firm. It com-
GREEN—EXPERIMENTS WITH SMALL FRUITS IN 1891.

EXPERIMENTS WITH SMALL FRUITS IN 1891.

Peaches to ripen soon after the middle of the strawberry season, and gives good pickings from the start. Altogether this is the most satisfactory early red sort that has been tested here, and can be recommended for general cultivation.

BLACKBERRIES.

The blackberry crop suffered more from frost than any other small fruit crop grown at the Station, hence but little can be said concerning any variety. Erie and Minnewaski seem to be taking the lead among the newer varieties. Both are reasonably hardy, although not entirely so here, and both are large, of good quality and fine in appearance. So far as can be judged, there seems to be but little choice between them. They are more hardy than the Lawton, and less liable to rust than the Kittatinny, although the Erie has shown a slight tendency to rust. Wilson, Jr., is not able to endure even mild winters, and has given but one crop in four years. Snyder, Agawam and Ancient Briton are the only varieties that pass the winter safely in this latitude. Early Harvest is commonly reckoned as tender, but is less often winter killed than Erie and Minnewaski. The berries are small, but uniform in size, and a beautiful glossy black that renders them very attractive and salable. Its extreme earliness and prolificacy make it a valuable sort. Either it is uncommonly well suited to this locality or its merits have been overlooked. If the robins would let it alone it would be as profitable as any variety that can be grown here. There must be some mistake regarding its reputed tenderness, as it stands next to Snyder in hardiness here.

Child’s "Everbearing Tree Blackberry" has been fully tested both under its present name and its former name, Topsy. It is of no value here because of its tenderness. It has been killed even in mild winters, and has never given a crop. The plants attain about half the height of ordinary varieties, and are indescribably thorny. It is the least promising of any variety ever tested here.

(2.) TREATMENT OF RASPBERRY ANTHRACNOSE.

Experiments in the treatment of raspberry cane scab or anthracnose were undertaken last spring, but as the results cannot be fully known until the next season’s crop is gathered the details will not be
given until after that time. The treatment seems to have been very beneficial, and is referred to here in order that those interested may know what materials to use. The following, which is a dilute Bordeaux mixture, gave the best results:

Copper sulphate, 4 pounds.
Lime, 4 pounds.
Water, 50 gallons.

To prepare the mixture the copper sulphate should be dissolved in two gallons of hot water, and the lime, which should be quick-lime, should be slacked slowly and water added sufficient to make a thin paste, or milk of lime. The copper sulphate solution is then to be poured into the lime, after which water sufficient to make fifty gallons is added. The quantity of lime recommended is more than is needed, but in practice it is found to be quite difficult to reduce all of it to the required consistency, and more or less remains in the bottom of the vessel in the shape of small lumps, which if left in would clog the nozzle; hence it is necessary to strain the lime paste before using, which occasions some loss, but leaves sufficient for the purpose.

The first application should be made early in the spring before the leaves open, at which time the spraying should be very thoroughly done. The second application should be made soon after the young canes appear above ground, and the spray directed to them alone. The third application is to be made in about two weeks from the date of the second, taking the same precaution to spray the young canes only. The fourth and last application for the season should be made just previous to the time of blooming, in the same manner as advised for the second and third sprayings. Raspberry eaves are very tender, and the mixture injures them slightly, but not enough to preclude its use, especially if some care is taken to keep it off the leaves of the bearing canes. The leaves on the young shoots of the current season's growth are not so easily harmed, hence no pains need be taken to keep it off them.

Six ounces of carbonate of copper dissolved in three pints of ammonia, to which fifty gallons of water are added, has been used with nearly as good results as the above, and with even less harm to the
foliage; but all things considered, the dilute Bordeaux mixture is preferred. The raspberry canes that have been treated with the above compounds are almost entirely free from the disease, and no doubt the crop will be much larger than upon the untreated plants. The prospect is so assuring that fruit growers are advised to make a trial of the treatment for themselves. It should be remembered that the remedy is preventive, hence the first application is probably the most important of all.

SUMMARY.

1. The blossoms of perfect flowered varieties of strawberries are more easily killed by frost than those having imperfect flowers.
2. Haverland Crescent, Warfield and Bubach are the most reliable of the fully tested varieties of strawberries. Gandy Pearl and Mimer are suitable for pollinizers.
3. The new varieties of strawberries that are the most promising are Brunette Barton’s Eclipse, Beder Wood, Dayton, Enhance, Greenville, Ivanhoe, Lovett’s Early, Muskingum, Parker Earl and Shuster’s Gem.
4. The following require further trial, but so far seem to be worthy: Jesse, Edgar Queen and Van Deem.
5. The following appear to have but little value or at least some serious faults: Stevens, Great Pacific, Lady Rusk.
6. The following well known and fully tested varieties of raspberries are recommended for general cultivation: Gregg, Ohio, Hilborn, Palmer, Turner, Cuthbert, Brandwyine and Shaffer.
7. The following new varieties of raspberries are promising: Cromwell, Kansas, Lovett, Muskingum, Royal Church, Thompson’s Early Prolific.
8. Smith’s Prolific appears to be of little value because of its tendency to rust.
9. The hardest varieties of blackberries, and most suitable for this latitude, are Snyder, Ancient Briton and Agawam.
10. Erie and Minnewaska are the most promising of the ever bearing varieties.
11. The value of Early Harvest seems to have been overlooked. It is very early and comparatively hardy.
12. Wilson Jr. and Child’s “Everbearing Tree Blackberry” are too tender for this latitude. The latter name is a misnomer, and the variety is the most nearly worthless of any that has been tested here.
13. The following mixture has proved efficient in preventing the raspberry scab, or anthracnose: Copper sulphate, 4 pounds; lime, 4 pounds; water, 50 gallons.
14. Four applications should be made during the season, the first before growth has commenced in the spring and the last just before the time of blooming.
15. Care should be taken in making the second, third and fourth sprayings, to direct the spray towards the young canes, and to keep it off the leaves of the bearing canes.
16. Six ounces of copper carbonate dissolved in three pints of ammonia, and diluted with water to fifty gallons is nearly as efficient as the above, but preference is given to the dilute Bordeaux mixture.

In the following article will be found a technical description of this and other diseases of the raspberry and blackberry, by Miss Freda Detmers, Botanist of this Station.

W. J. Green, Horticulturist.
ARTICLE X.—DISEASES OF THE RASPBERRY AND BLACKBERRY.

Technical Description.

(1). ANTHRACNOSE OF RASPBERRY AND BLACKBERRY.

Gleosporium venetum, Sp. (Plates III, IV.)

This disease has become very destructive in the berry patch, and yet seems to be but little noticed or understood by the average fruit grower of the State. It is due to a fungus, a true parasite, developing only in the tissues of living plants. Professor T. J. Burrill, of the University of Illinois, published in the Agricultural Review of November, 1882, so far as we know, the first description of the fungus, under the name of the Raspberry Cane Rust. He gave it no specific name, but said it probably belonged to the same group of Fungi as the Grape Anthracnose. Since then it has been reported from time to time, and appears to be widespread as well as destructive.

A detailed account of the fungus and its effect upon its host is given in the Report of the Department of Agriculture for 1887, but as these reports are not accessible to all in the State, a full description will be given of it here.

EXTERNAL APPEARANCE AND EFFECT UPON THE HOST.

The fungus was first observed on the black-cap raspberry early in May, when the young shoots were about a foot high. On these shoots, at or near the surface of the ground, appear small purple spots, which are round, distinct, and scattered irregularly on the canes. The spots rapidly increase in size and number, extending around and up the cane, the youngest spots being uppermost. At first purple, they soon become whitish in the center, with a raised purple border marking the line of separation between the healthy and diseased tissues (plate III). The white center dies, the border becomes brown, often the spots coalesce, when the dead epidermis ruptures, and we have ragged looking patches of several inches in length and entirely girdling the cane.
The purple spots also occur on the leaf petiole, veins, and leaf tissue. The veins are a little swollen, and the affected petioles curl downwards. On the parenchymatous portion of the leaf the spots are much smaller than on the canes.

The disease is not fatal the first season, nor does it seem to visibly affect the growth of the young canes; but the next season, when last year's young canes bear fruit, its destructiveness becomes but too apparent (plate IV). The effects of the fungus are most noticeable at the time of the ripening of the berries, which do not attain to a normal size, but shrivel, and finally dry up; the leaves are much smaller than healthy ones, and have a generally unhealthy appearance, later turning yellow, then brown. The canes finally become blackened and die.

The period of most rapid growth for the canes is also the period of greatest development of the fungus. From June until August this rapid development is kept up; then its vigor seems to abate somewhat. During August of this season, after the worst diseased canes had been removed, the others seemed to recover and become much greener than they were before, although fresh spots of the fungus still continued to appear on the young growth. During the latter part of August and first of September the extreme ends of the shoots rapidly turned a purplish black, without showing definite Anthracnose spots, and died. The extreme tip blackens first, the discoloration extending down the shoot. The young leaves are stunted and do not open.

BOTANICAL CHARACTERS.

The fungus consists of a mycelium, the vegetative portion; and the spores, the organs of reproduction.

The mycelium is a very minute white thread, imperceptible to the unaided eye, and penetrating between the cells draws from them the nourishment needed by the host plant. It causes first the discoloration of the tissues seen in the purple spots, and later kills the cells outright. The mycelium does not penetrate to the pith, but is confined to the bark and cambium layer, and has the same effect on the canes as though the latter were girdled with a knife; indeed, many of the diseased areas have that appearance.
In the center of the spot appear little, yellowish, raised specks or globules, visible to the unaided eye, (plate III); in these are the spores. The mycelial threads unite and form a tuft in the center of the spot; this tuft is made up of short slender hyphae, called basidia, growing side by side and at right angles to the mass of mycelium. On the summit of each basidium is borne a spore or conidium, a minute one-celled, colorless, oval body. The basidia are formed beneath the cuticle, through which they soon burst; but they and the spores they bear are held in these little yellow globules by a gelatinous substance, which is soluble in water. During a rain or heavy dew this substance is dissolved; the spores are set free and float away in the water. They are capable of germinating at once, and when they lodge on another portion of the plant the spore is ready to send its little germ tube into the tissue and begin a new growth. The parasite is thus spread from leaf to leaf and from cane to cane. These conidia are but short lived and cannot perpetuate the fungus from year to year. No resting spores have yet been discovered; but these are not needed, as the mycelium is perennial and passes the winter in the cane.

(2). SEPTORIA RUBI (Westd)

In this disease the leaves of blackberries and raspberries and particularly the dewberry are badly spotted. The spots are similar to Anthracnose spots, but are larger, and on closer examination are seen to be dotted with small black slightly raised specks, visible to the unaided eye. Examine these with a lens, and from the apex of each black speck, or perithecium, a tiny, white, threadlike tendril protrudes. These tendrils are made up of sporules which emerge from the perithecium in this manner. The sporules are hyaline (colorless), linear, somewhat curved. The spots occur on both sides of the leaves. Though very abundant the fungus does not seem to have done much damage.

There are two other diseases affecting the blackberry and raspberry, which are also very destructive and hard to combat.
The first of these diseases is *Oxoma nitens* the common Red Rust. It was very abundant this year, there being scarcely an uncultivated berry patch that was not literally red with the rust, and many a cultivated patch suffered severely.

In April, or as soon as the leaves appear, they have a peculiar golden cast. It shows strongly on the margin. Unfold such a leaf and the whole upper surface is found to be dotted with little golden globules or tubercles; these are the spermagonia; little, rounded, cone shaped sacs, containing minute colorless cells—the spermia.

The spermagonia are soon followed by the sori containing the orange colored spores. The spores are connected in chains, and are not powdery, but form a waxy, reddish orange layer over the affected portion of the leaf. This is the stage of the fungus which gives to it the name of Red Rust.

The mycelium of *Oxoma nitens* lives throughout the winter in the canes. In May, 1891, experiments were made by Mr. F. C. Newcombe* to determine whether there is a perennial mycelium or not. He says:

"A shoot of the blackberry was selected whose lowest leaf bearing the rust was 16 centimeters from the rooting portion of the stem. Beginning with the leaf, cross and longitudinal sections were made at intervals of 2 centimeters, down to the roots." At every section he found the mycelium between the cells; in one case in the medullary rays; in every other in the pith, looking just as active in the cell as in the young, green shoots. From this mycelium, haustoria (suckers) were sent out which pierced the wall of the cell, and in the interior of the cell expanded “to a large lobed, knotted, club-shaped body, whose diameter exceeds that of the mycelial filament, and whose length frequently attains the transverse diameter of the host-cell.” In longitudinal section the mycelium was followed for long distances, sending its haustoria in all directions.

The same experiments were made by Professor T. J. Burrill of the University of Illinois, either in April or very early in May of 1891.

* *Journal of Mycology, Vol. VI, 1891, pp. 106, 107, pls. V and VI.*
He kindly permitted me to examine the sections, in which the mycelium and haustoria were plainly to be seen.

The fungus once established in the canes, lives from year to year through its perennial mycelium. It is spread from plant to plant by means of the spores. Spraying with fungicides can only be beneficial in preventing the spores from germinating on the leaves of healthy plants. The canes already diseased should be destroyed, as the fungicides will not reach the fungus.

The parasite effects its host in a peculiar manner; often on a fruiting branch, in place of one strong fruit-bearing shoot, there appears a cluster of half a dozen feeble, yellowish-looking shoots. The diseased canes are said to die the third season.

"Osoma nitens," says C. A. J. A. Oudemans, Hedwigia 1891. Heft 3, S. 178, "must in future be called Osoma interstitiale." He supports this statement by drawing attention to the fact that von Schelchtendal in 1820 described an Aecidiomycetes found on the leaves of Rubus articus, collected in Kamtschatka 1817, the characteristics of which correspond exactly with those of O. nitens. Therefore the "Schlechten-dal'sche" name, C. interstitiale, must have precedence.

(4). A BACTERIAL DISEASE OF THE RASPBERRY.

The second disease that must not be confused with Anthracnose looks, at first sight, remarkably like it. It occurs in the Experiment Station berry plantation on the Turner and Marlborough red raspberries, and is reported from Illinois on the Snyder blackberry.

At the base of the canes, usually quite near the surface of the ground, occur brownish black patches from one-half inch to several inches long and extending completely around the cane. There are also smaller patches at the bases of branches, on the petioles and under surface of the mid-veins of the leaves, which curl downwards. The parenchymatous portion of the leaf does not seem to be attacked. These blackish patches differ from those caused by Anthracnose in that the epidermis does not crack, and though blackish-brown in color, they do not look dry. The discoloration extends to the sub-epidermal tissues.

The row of Marlborough raspberry was most affected, the leaves were all curled over and the whole row looked as though blasted. On
July 19th I sent a diseased cane of the Marlborough to Professor T. J. Burrill, of Champaign, Ill., and received July 21st the following reply:

"I have only had time to examine the Marlborough, and find the same trouble that we have here on some Snyder blackberries, which is an undescribed bacterial disease altogether distinct from that called Anthracnose."

Again July 28th, Professor Burrill wrote:

"It has now been satisfactorily determined that the disease of raspberry and blackberry canes showing wide dark discolorations of the bark without rupture of any kind is blight—'pear blight.' I have formerly suspected this, now it seems certain. We have the same trouble, and this year more than I had seen before. The same stems frequently are spotted with Anthracnose, but the two diseases are very distinct."

I made cultures from diseased stems on a nutrient culture medium and obtained what appears to be a pure growth each time, but have as yet inoculated no healthy canes with them.

I wish every owner of a berry patch in Ohio would carefully examine his canes and find out whether any or all of these diseases described are present, and if so take note of these points:  
1. Date of first appearance of the disease.  
2. Time of most marked increase.  
3. Effect of hot, dry weather.  
4. Manner and amount of injury done the host.  
5. Varieties affected.  
6. In the case of Red Rust, whether the fungus kills its host the third season.

I should be glad to receive reports on these points, and specimens and any notes of interest at any time. I do not limit this appeal for assistance to the diseases affecting raspberries and blackberries only, but ask for co-operation in the study of all diseases of plants. We can thus aid one another in determining not only the nature and life history of the disease, but also some method by which its ravages may be checked or prevented.

FREDA DETMERS, Botanist.
ANTHRACNOSE OF RASPBERRY.

Plate III (Original)—At the right, young cane of black-cap raspberry showing early stages of the disease; natural size. At the left, a fruit body containing spores; several loose spores are shown above; mag. F. Detmers, del.
ANTHRACNOSE OF RASPBERRY.

PLATE IV.—Fruit bearing cane of black-cap raspberry showing the contrast between leafless diseased, and comparatively healthy branches. Less than natural size. From a photograph by F. Falkenbach.