

Author: Fruit Growers Association of Adams County

Title: Proceedings of the. . .annual convention

Place of Publication: Bendersville, Pa.

Copyright Date: 1917

Master Negative Storage Number: MNS# PSt SNP aAg016.12

1917

THE
Fruit Growers Association
of Adams County
Pennsylvania

ORGANIZED DECEMBER 18, 1903

PROCEEDINGS

OF THE

THIRTEENTH ANNUAL CONVENTION

HELD IN

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Wednesday, Thursday and Friday

December 12, 13, 14, 1917

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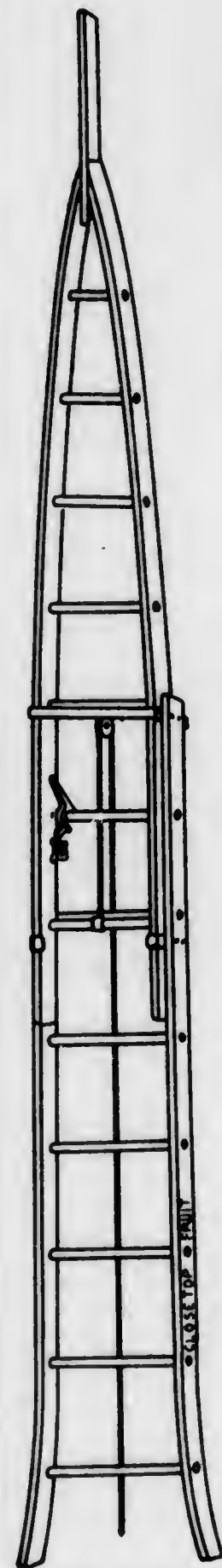
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With the "REITER" Bolster Spring on the American Farm Wagon

You can haul or carry any and everything equal
to any spring wagon and at one-half the cost

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CONSTITUTION

Preamble.

Being interested in fruit growing and believing that, by organization, we may materially advance our common interests, we hereby adopt the following Constitution and By-Laws.

Article I.—Name.

This Association shall be known as The Fruit Growers' Association of Adams County.

Article II.—Object.

The object of this Association shall be to encourage the co-operation of the fruit growers of Adams County for the protection and advancement of their common interests.

1. By securing and disseminating such scientific and practical information as shall promote the general advancement of the fruit growing interests in this county, and shall tend to the improvement of the quality and quantity of our products.

2. By securing such legislation as may be advantageous, and preventing that which may be detrimental.

3. By securing such improved facilities in transportation as shall tend to give us more expeditious and economical distribution.

4. By endeavoring to secure a better and more uniform system of packing and package.

5. By devising a plan of advertising and marketing which will develop and increase the demand for Adams County fruit and promote closer relations between growers and markets.

6. And by endeavoring to obtain such improved systems of crop reporting as shall furnish, through coöperation with other similar associations, accurate information concerning production, thereby enabling the fruit grower to know the exact situation.

Article III.—Membership.

1. Membership in this Association may be secured by application to the Executive Board and shall consist of two classes, regular members and special members as hereinafter described.

2. The regular members shall include all persons acceptable to the Executive Board, who are interested in fruit growing and who have paid annual dues of \$1.00. Members of this class shall, until the next annual meeting, be entitled to attend and participate in the educational features of all regular and special meetings and to receive all published reports thereof.

3. The special membership shall include all regular members, acceptable to the Executive Board, whose orchards are located within the limits of the Adams County fruit belt, and who, in addition to paying the annual dues specified for regular members, have paid special annual dues at the rate of twenty cents for each acre of orchard they own and who have also paid such additional assessments as the Executive Board may deem necessary from time to time, subject to the approval of the Association, had at a meeting following a ten-day written notice which shall state object of meeting and amount of proposed assessment. Also any regular member not owning orchards and acceptable to the Executive Board, may become a special member by contributing annually, for the use of the Association, the sum of \$5.00 or over. Members of this special class, in good standing, and whose dues are not in arrears shall, until next annual meeting, in addition to enjoying all rights and privileges accorded regular members, have the exclusive right to vote on all matters of business, to receive all crop and market reports, and to have free access to all information which the Association is able to collect.

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THE OLDEST, STRONGEST AND BEST COMPANIES, viz:

Continental, Home, Hartford, Phoenix Fire Association, North America, Aetna, London Assurance, Farmers of York, and others

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GOOD MUTUAL COMPANIES when desired

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Holiday Gift Suggestions

With Christmas just a short time ahead, and market conditions worst ever to get goods, we advise early buying this year especially.

Our line of useful gifts now here is worth your inspection:

**Handkerchiefs, Hosiery---Silk, Cotton and Wool,
Gloves, Collars, Umbrellas, Silks,
Dress Goods, Furs, Scarfs, Rugs, Skirts, Sweaters,
Neckwear for Ladies and Gents**

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GETTYSBURG, PA.

Each partnership, corporation or estate holding special membership rights shall be entitled to one vote, and shall be represented by some individual designated by them.

4. Services for personal benefit only, when approved by the Executive Board, may be undertaken by the Association at the expense of the special member desiring such service.

5. The communication of any information concerning the business of the special membership, to any person, persons or corporation other than special members in good standing, shall, upon proof satisfactory to the Executive Board, immediately terminate the membership of the offender without refund of dues, unless such communication has been authorized by the Executive Board.

6. All members, subject to the approval of the Executive Board, may renew their membership annually by the payment of the annual dues specified for their class.

Article IV.—Dues and Assessments.

The annual dues of both regular and special members, as specified by Article III, are payable to the Secretary at the meeting immediately preceding the annual meeting, as a receipt for which the Secretary shall issue a certificate of membership for the succeeding year. All assessments shall be paid within thirty days from date of authorization.

Article V.—Officers.

The officers shall consist of a President and four Vice-Presidents, a Secretary and Treasurer, all of whom shall be elected by ballot at each annual meeting, to serve for the term of one year, or until their successors shall be chosen. These seven (7) elective officers shall constitute an Executive Board.

Article VI.—Quorum.

Five (5) members shall constitute a quorum for the transaction of business.

Article VII.—Amendments.

The Constitution and By-Laws of this Association may be amended at any regular meeting by a two-thirds vote of the members present, a notice of the proposed amendment having been presented in writing at a previous regular meeting.

Article VIII.—Fruit Districts.

For the purpose of distributing the work of the Association and extending its scope, the County of Adams shall be divided into the following seven (7) districts: District One, or North District, to consist of Menallen Township; District Two, or West District, to consist of Franklin Township; District Three, or Southwestern District, to consist of Highland, Liberty and Hamilton Townships; District Four, or South District, to consist of Cumberland, Freedom and Mt. Joy Townships, and that portion of Straban Township lying south of the Western Maryland Railroad; District Five, or Eastern District, to consist of Germany, Union, Conowaga, Mt. Pleasant, Oxford, Reading, Berwick and Hamilton Townships; District Six, or Northeastern District, to consist of Latimore, Huntingdon and Tyrone Townships; District Seven, or Central District, to consist of Butler Township and that portion of Straban Township lying north of the Western Maryland Railroad.

Article IX.—Standing Committees.

The following four (4) committees shall be appointed annually by the newly elected Executive Board and announced at the January meeting, as follows: a Committee on Programs, a Committee on Membership, a Committee on Exhibits, and a Committee on Legislation.

"Black Leaf 40"

(40 per cent. Nicotine)

KILLS

Green Apple Aphis	Rosy Apple Aphis
Woolly Aphis	Apple Red Bug

10-pound tin	\$10 75
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Makes 800 gallons of spraying solution for Woolly Aphis and Apple Red Bug; 1,000 gallons for Green Aphis and Rosy Aphis.

2-pound tin	2 50
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"Black Leaf 40"

Is Recommended by Experiment Stations

It is the "standard" spray for Aphis, Red Bug, Thrips, and similar insects. May be used in combination with Lime-Sulphur, Arsenate of Lead, Bordeaux Mixture, Pyrox, etc.

It is Sold By:

S. G. Bigham, Biglerville; J. P. Bixler & Sons, Carlisle; H. W. Skinner and A. L. Solenberger, Chambersburg; Tyson Bros., Inc., Flora Dale; R. S. Reindollar & Bro., Fairfield; Gettysburg Department Store, Gettysburg; Emlet & Emlet and J. C. Tanger Co., Hanover; Holmes Seed Co., and Walter S. Schell, Harrisburg; Adams & Baker, Idaville; D. M. Wertz & Co., Quincy; C. Alvin Fogelsanger, Shippensburg; R. J. Gillan, St. Thomas; D. L. Miller Co., Waynesboro, and Everhart's Drug Store, Serff & Jacobs, and N. H. Shearer & Co., York. Also, Emmert Hardware Co., Hagerstown, Md.; Rothwell & Co., Martinsburg, W. Va., and other dealers at fruit centers.

PLACE YOUR ORDER WITH YOUR DEALER.

Manufactured by

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BY LAWS

Article I.—Duties of President.

The President shall be the executive officer of the Association and of the Executive Board, and shall preside at all meetings of either body. He shall pass upon all bills and accounts of the Association before they are ordered paid by the Secretary.

Article II.—Duties of the Vice-Presidents.

The highest designated Vice-President present at any meeting shall preside in the absence of the President; all of the four Vice-Presidents shall serve on the Executive Board in conjunction with the other elective officers, and, in addition, each Vice-President shall have special duties, as follows:

The First Vice-President shall be chairman of the Program Committee and be responsible for the preparation of a program for each Educational meeting.

The Second Vice-President shall be chairman of the Membership Committee and shall use every effort, personally and through members of his committee, to extend the membership and secure renewals.

The Third Vice-President shall be chairman of the Committee on Legislation and it shall be his duty, in connection with the members of his committee, to urge beneficial legislation and oppose that which may be detrimental, and keep the Association advised on legislative matters.

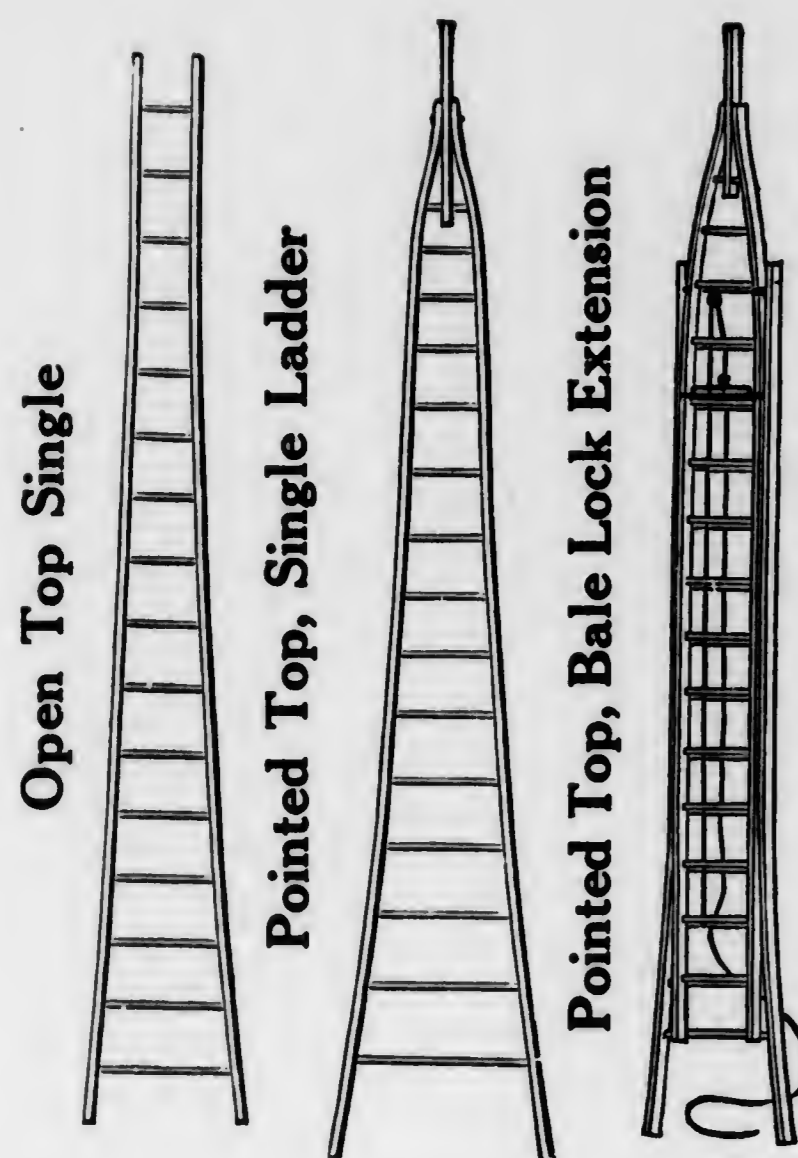
The Fourth Vice-President shall be chairman of the Committee on Exhibits and have entire charge of securing fruit for exhibits and displaying same as directed by the Association.

Article III.—Duties of the Secretary.

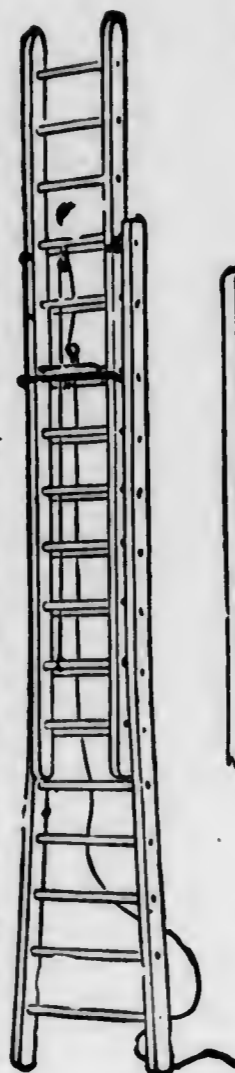
The Secretary shall be the recording, corresponding and accounting officer of the Association and of the Executive Board; he shall make no expenditure of a large or doubtful character without the sanction of the board; he shall secure the written approval of the President on all bills or claims against the Association before drawing his order on the Treasurer for the payment thereof; he shall attend all meetings of the Association and of the Executive Board, and shall keep a faithful record of their proceedings; he shall sign all certificates of membership and all diplomas and certificates of merit awarded by the Association. All money received by him shall be promptly paid to the Treasurer. He shall have full charge of the Association's books and papers and shall be responsible to the board for all property placed in his charge. He shall be the custodian of the seal of the Association and shall have authority to affix same to documents when needful. It shall be his duty to prepare and issue from time to time such reports as may be authorized by the Executive Board, and to present to each annual meeting a report of the work of the Executive Board. He shall mail a notice of dues to all members one week prior to the November meeting, at which time all dues are payable. As recompense, the Secretary shall receive all necessary expenses and such salary as may be determined by the Executive Board.

Article IV.—Duties of the Treasurer.

All the funds of the Association shall be paid into the hands of the Treasurer; he shall disburse the moneys of the Association that come into his hands only upon order of the Secretary countersigned by the President. Immediately preceding the annual meeting he shall submit to the Executive Board a written report showing the amount of money that shall have come into his hands during the year, the sources from which it has been derived and disposition made of the same.



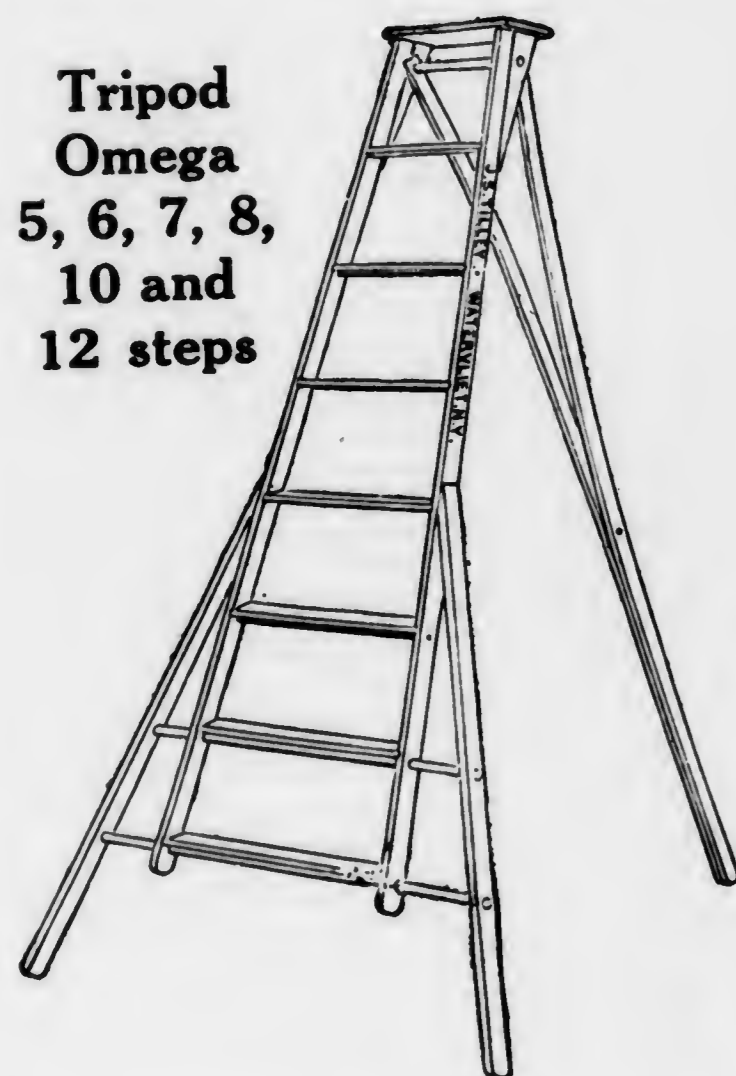
This is the most convenient orchard ladder ever produced for trimming trees and picking fruit. Entirely new, works perfect



Bale Lock Extension

Quick and Positive

Always keep rope hand close to ladder when operating top section. Pull rope to raise the traveling section. To lower traveling section carry the hand slightly to the right while Bale is in vertical position. To lock it, carry hand to the left, always keeping rope hand close to the ladder and the Bale will drop in position and lock it secure.



Tilley's Omega Tripod Step Ladder

'First-class in every respect. stiff, rigid, light and durable. All flat steps to stand on. The two lower steps are supported by, and rest on rounds which tie, support and thoroughly brace the main ladder. Fully covered by patents dated December 26, 1910.'

JOHN S. TILLEY LADDERS CO., Inc.

Manufacturer of Ladders and Step Ladders of every description

Factory, WATERVLIET, N. Y.

Article V.—Duties of the Executive Board.

The Executive Board shall enact all rules and regulations for the management of the affairs of the Association, determine the salaries of its officers and assume the control and management of its exhibitions; it shall have power to displace any officer of the Association for neglect of duty or abuse of position, and shall pass upon all candidates for membership and renewals thereof with power to annul membership for cause; shall fill all vacancies by appointment to continue until the next annual election; it shall carefully guard the interests of the Association, watch over its finances and provide for its necessities as they shall arise; and it shall submit to the annual meeting, through the Secretary, such report upon the condition, general interests and prospects of the Association as it shall judge necessary or expedient. All important measures shall be submitted to this board, but may, by the board, be re-submitted to the Association for recommendation.

Article VI.—Duties of the Standing Committees.

1. The Committee on Programs shall be responsible for the preparation of a program for each educational meeting.
 2. The Committee on Membership shall bring the work of the Association to the attention of fruit growers throughout the county, and by such means as they deem best, strive to increase the membership.
 3. The Committee on Legislation shall inform itself in regard to such existing laws as relate to the horticultural interests of Adams County and bring the same to the attention of the Association, at the same time reporting any additional legislation which in their judgment is desirable. When so directed by the Association, it shall cause to be introduced into the state legislature such bills as may be deemed necessary, and shall aid or oppose any bills introduced by others which directly or indirectly affect the interests of the fruit grower.
 4. The Committee on Exhibitions shall suggest from time to time such methods and improvements as may seem to them desirable in conducting the exhibitions of the Association, and with the assistance of the Executive Board, shall arrange the premium lists and have charge of all the exhibitions of the Association.
- Such other standing committees may be created by the Executive Board from time to time as in its discretion may be desirable or necessary.

Article VII.—Meetings.

There shall be a regular meeting of the Association on the second Saturday of each month at 7:30 p. m., unless otherwise ordered. The meeting held in December to be regarded as the annual meeting. Special meetings may be convened by the Executive Board at such times as they may appoint.

Article VIII.—Initiation of Officers.

All new officers shall assume the duties of office at the opening of the meeting immediately following the one at which they were elected, except that the newly elected Executive Board shall prepare and announce, at the January meeting, the membership roll of the four committees specified in Article IX, and the chairman of Program Committee shall prepare a program for the February meeting and announce same at the January meeting.

Article IX.—Order of Business.

1. Reading of minutes of previous meeting.
2. Nominations and elections.
3. Reports of committees.
4. Deferred business.
5. Communications.
6. New business.
7. Discussion of questions.



No. 1, FOLDING CRATE, with or without cover See catalog for other styles and sizes
OVER 25,000,000 IN USE TO-DAY

CUMMER line of
RATES, for every service,
CANNOT be excelled.

RIGID, collapsible, or folding
RIGHT in all proportions
REASONABLE in price.

ALL materials used
ARE carefully selected and construction
ASSUREDLY honest throughout.

TAKE our word for it
THIS brief statement is worthy
O fill your "pipe of reflection."

EACH crate is as nearly
VERLASTING as is humanly possible and
INCOMIUM encourages examination.

STRONG language is never
SERVICEABLE unless backed up by the goods.
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World's Largest Makers

HIGH CLASS

*FRUIT AND
VEGETABLE
PACKAGES*

ANNUAL OUTPUT

Sixty Million Packages
TEN PLANTS IN FOUR STATES

Baskets

Crates

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FARMERS MANUFACTURING
COMPANY

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Ask for samples and prices

"ELECTRO DRY"



ARSENATE OF LEAD POWDER is the word to remember when you want to kill bugs.



"ELECTRO" ARSENATE OF LEAD POWDER really kills insects and bugs. It is so fine and mechanically perfect that it mixes instantly with water.

When mixed it stays mixed, insuring an even covering of the leaf surface and won't wash off.

Less than a pound of "Electro" Arsenate of Lead Powder is required for 50 gallons of water.

Manufactured by

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Flora Dale, Pa.

PROCEEDINGS
OF THE
THIRTEENTH ANNUAL CONVENTION
OF THE
FRUIT GROWERS ASSOCIATION
OF
ADAMS COUNTY, PA.

The Thirteenth Annual Convention was called to order and addressed by the President, C. Arthur Griest, at 2:00 p. m., Wednesday, December 12, 1917, in Fruit Growers' Hall, Bendersville, Pa.

President's Address.

C. A. GRIEST, *Guernsey, Pa.*

Another milestone has been reached and we have again assembled for exchange of thought, for comparison of conditions and methods, and with the hope of getting some new ideas which may be applied to our personal needs during the coming year. The problems of the fruit grower have not all been solved, in fact, it seems to me, that for every insect pest or fungus trouble we learn to control, there is a new one presents itself for our thought and consideration. But have not these obstacles been a benefit to the business of fruit growing and to the fruit grower himself? The appearance of the scale and codling moth caused us to waken up and study our spraying lesson. We learned what material would kill these insects, when to apply it for best results, and the importance of thorough spraying. Then came the aphis, the red bug, the curculio, the leaf curl, the scab, the blotch, the bitter and brown rots, etc., all to be controlled by spraying. These additional spray problems made us study the harder to learn how we could combine sprays, and spraying operations, so as to control all the pests at the minimum cost of labor and material.

The blight brought with it another problem which forced us to go deeper into soil management and study more carefully the cultivation, the cover crops, and the fertilization of our orchards so as to avoid as far as possible having conditions favorable for the development and spread of blight spores.

These problems, with many other similar ones, have been solved by the fruit grower to the extent that we are producing fruit that has gained a reputation in the markets of the world, and is being sought by the discriminating buyer and consumer. Now we are facing new problems of a somewhat different character. We are engaged in a great war for humanity, the seriousness and necessity for which are just dawning upon the American people. (Read carefully the address of Mr. H. C. Culbertson, of the National Department of Food Administration, farther along in these "Proceedings." It will give you new light on the vital importance of the subject.) What can we as a fruit growers' association and as individuals do to help win the war? How can we produce more food products per acre with less labor and less capital? How can we increase our production with important commercial plant foods unavailable? How can we control insects and diseases with sulphur almost unobtainable? How can we harvest our crops and perform other important operations without the usual amount of help? Let us intensify every operation, eliminate every unnecessary move, and speed up a little, for our country needs every effort we can put forth. Let me say that we appreciate what has been done by State College in sending an entomologist to this county, who spent the greater part of the summer hunting and studying the insects found in our orchards and reporting to the respective owners what was in his particular orchard, the exact time to spray to be most effective, and what material to use. You will find a report of this work in the address of Prof. C. H. Hadley on another page. We have also had the coöperation of the Secretary of Education of the state through the vocational department, in helping with the labor problem. They granted the high school boys over sixteen years of age who had the required class standing the privilege of going out in camps for two weeks to help the farmers. As many of you know, there were two such camps in Adams County during apple picking season. The experiment, if it may be termed such, was a success, at least to the extent of developing the strong and weak features of the plan. The boys came from school with little or no knowledge of farm work and not hardened to any kind of manual labor. When put to work with home boys of the same age and size, who had been working day after day and week after week, the contrast in amount and character of work done was very noticeable, and yet they demanded the same wage as the boys who were physically fit and knew how. By the end of two weeks, however, they had gained in strength and ability so that it would seem that in the future a four weeks' camp would be preferable to one of two weeks' duration. Looking at it from the educational side, it gives the boys a broader field of vision, brings them in closer touch with nature, and gives them a knowledge not to be obtained in the school room.

Combating New Pests.

BY J. G. SANDERS,

Economic Zoologist, Harrisburg, Pa.

(An abstract prepared by the author.)

Mr. President, Ladies and Gentlemen: I want to assure you that I prize this opportunity to meet with you in this annual gathering of Adams County horticulturists. Last year I was forced by previous engagements to forego this pleasure; and even now I am exceedingly sorry that other calls prevent my attendance at this meeting more than a couple of hours.

With the aid of a few slides for illustrations, I wish to talk with you for a brief period on a subject which I believe implicitly is one of the most important factors affecting the growth and development of agriculture and horticulture in America, and for safeguarding these interests in future years.

Each year many millions of dollars are lost to our country and her people through the destruction of certain percentages of each and every crop grown. More than half of these startling losses can be attributed to attacks of insects and diseases which have been carelessly introduced from foreign countries on nursery stock, in the soil about the roots of imported plants and in other ways.

The trade in various types of nursery stock grown in other countries and imported to America is enormous; unnecessarily enormous. Nine-tenths of the plants now imported could be readily grown here for sale and distribution, without the attendant dangers of introducing some new pest of agriculture to add to the destruction already so severe in our country. As has been said on other occasions, the American citizen, whether producer or consumer, undoubtedly pays the heaviest tax of any person in the entire world for destruction of crops and their products by insects and plant diseases. Too great dependence has been placed on other sources of supply for these and other materials which can be produced here with greater safety, and now the time has come for our people to demand a cessation of these pernicious practices which may bring profit for the time being to a few, but ultimately lead to greater and greater difficulties in crop production.

Unless this open door policy of plant introduction is altered, the number and character of pests introduced and the losses which will occur will overwhelm us, and economical production of crops will be impossible. All who have had experience in agriculture or horticulture can attest to the constant warfare which must be waged against plant pests in order that a reasonable crop can be secured. Each year under the present system of miscellaneous importations of plants in immense shipments of many tons each, sometimes

amounting to shiploads, what chance has the trained inspector to detect insects which are hidden away in an earthen cell in soil about the roots of plants so shipped. Fumigation of these large masses of earth bound in burlap has been attempted by several methods and with the best known chemicals for the purpose, but without success in destroying the hidden insects. Spores of plant diseases cannot be detected by the most careful inspections, except when the disease is in an advanced stage.

Under the present war conditions, plant shipments have been reduced to a very low mark, almost to the point of prohibition, yet our florists have been able to report in their trade papers a very successful holiday trade by replacing the usual supply of azaleas and other imported plants with plants of their own propagation. Let us continue in this safer method.

Some very serious and destructive pests have been introduced within the past few years, and even now some undiscovered pests are multiplying which will be brought to light soon, if we may judge by past experiences. Let us review a few of the more important and destructive pests of plants recently established in our country.

The gipsy moth has already cost us in the neighborhood of fourteen million dollars in efforts for suppression, but the pest still continues its gradual spread to new territory. The brown-tail moth has spread more rapidly due to its powers of flight and now is destructive to tree life in all New England states and has penetrated far into northeastern Canada. The destruction wrought to the elm trees of our eastern states by the elm leaf beetle from Europe is well known in the affected area. The leopard moth which attacks several of our best shade trees is doing damage in the vicinity of New York and in states adjoining, near the seashore.

More recently there have appeared some pests which promise to be as serious as any yet established. One of these has been pronounced by our best judges as "probably the most serious pest of fruit trees that has ever been introduced in the United States." This reference to the oriental peach moth (*Laspeyresia molesta* Busck) is not overdrawn in consideration of the past season's observations. Attacking the new twigs, buds and fruits of the peach, plum, quince, apple, apricot and cherry in a destructive manner, this pest introduced from Japan in nursery stock promises to do more damage in a few years than the value of all the nursery stock imported to the United States during the past quarter century.

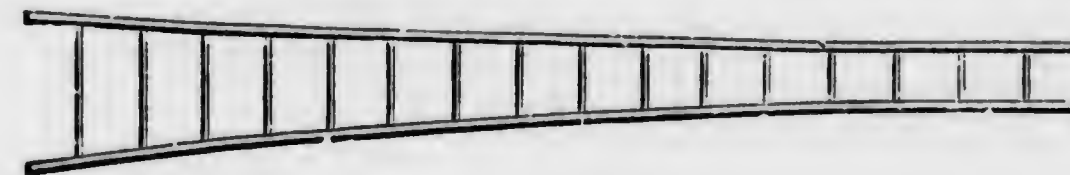
Only last summer (1917) the establishment in enormous numbers of a destructive beetle (*Popillia japonica*) from Japan was determined at an important horticultural center in New Jersey. This pest was apparently introduced in the soil about the roots of a shipment of Japanese iris imported about four years ago. An acknowledged pest in its native country attacking grapes, roses and other blossoms, the foliage of plum and cherry, and several other useful and ornamental trees and shrubs, we cannot as yet judge the great importance

of this pest here; but since such pests are usually more severe than in their native homes, we know we are harboring a dangerous enemy.

The recent discovery of the European mole cricket and the earwig in destructive numbers in New Jersey and Long Island forces our attention more definitely to the dangers of importing soil with plants from foreign shores. These pests are well nigh uncontrollable without great effort and they promise to be very troublesome after a few years. A large number of destructive weevils, cutworms, slugs, wireworms, caterpillars, beetles, scale insects, aphids and mites could be named and discussed at length with much interesting history of heavy losses occasioned by their attacks, but this abstract will not permit.

Finally, it surely appears that our policy and methods of plant introduction are wrong and should be altered at the earliest time compatible with reasonable nursery procedure. Experience proves to those who have been watching the introduction and progress of these new pests that the business which is responsible for most of these introductions will not take the lead in overcoming the dangers. The nurserymen and florists will not of their own accord make a change in methods, although these dangers have been pointed out to them on many occasions, and striking examples of pest introduction entered as evidence. Yet these same business men are to suffer along with others in curtailment of orders.

The chestnut blight from China, the white pine blister rust from Germany, the poplar blight and imported poplar weevil have practically eliminated a demand for these trees, and the nurseryman suffers a loss of business thereby, while the final loss of these valuable trees in their natural areas is incalculable. Eight years ago the citrus canker was unknown, but having been introduced with orange trees from China into Florida, last year there were appropriated for repressive control measures approximately eight hundred and forty thousand dollars. Does it pay to allow anybody and everybody the privilege of bringing in whatever he likes in plant forms? A bill has been introduced in Congress prohibiting plant importation except by the United States Department of Agriculture, and every right minded citizen should support it fully.



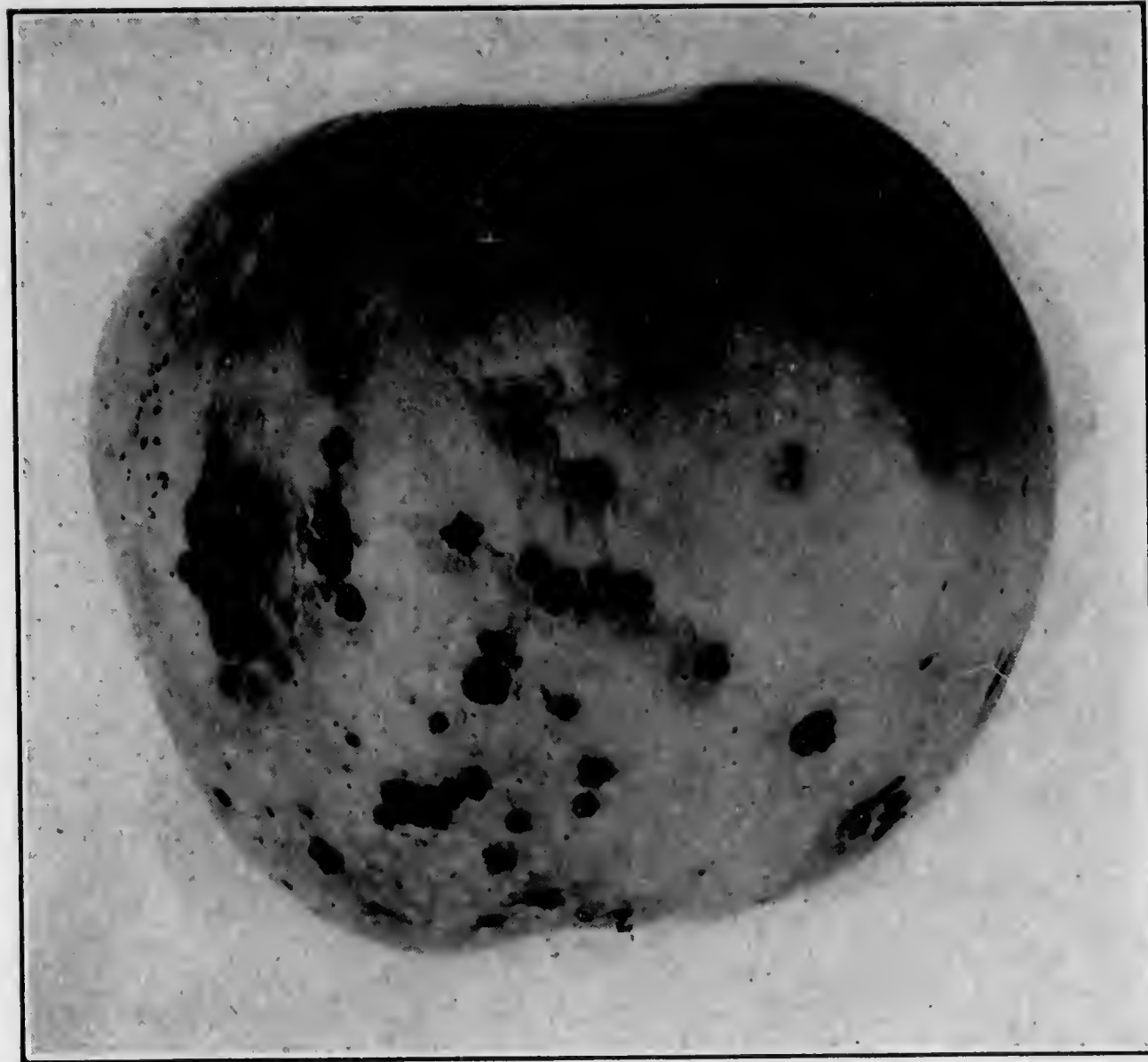


FIG. 1. APPLE SCAB DISEASE.

This apple is nearly mature and shows abundant late infections. Note particularly the numerous small black scab specks at the left.

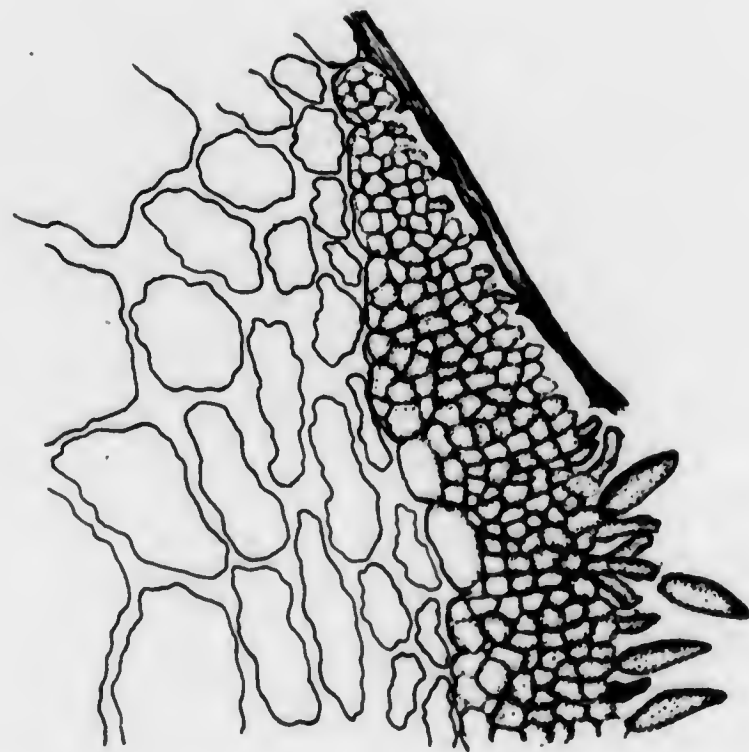


FIG. 4. SUMMER STAGE OF THE APPLE SCAB FUNGUS.

Drawing of a very thin razor section, much magnified, through the margin of a scab spot on a fruit. The cuticle is lifted, the tissue near the fungus is shrinking and the fungus has produced some black spores which break off readily and are blown to other trees.

What the Farm Bureau is Doing for the Adams County Fruit Grower.

H. F. HERSHEY,
County Agent, Gettysburg, Pa.

The Adams County Farm Bureau was organized in February, 1917, and the County Agent started work on May 7, 1917. First of all, I wish to tell you what the Farm Bureau is and something about its workings, and this applies to the fruit grower as well as to any other type of farmer in the county.

The Farm Bureau is an organization composed of farmers and men who are interested in "better agriculture" for Adams County. Any one who signifies his intention is a member, as there are no dues. Membership carries with it the privilege of voting for the officers and the executive committee. An annual meeting is held yearly, in the month of December, and everyone should make it a point to be present, so as to keep in close touch with the work. Due notice of the meeting will be given through the newspapers and by means of a circular letter.

The Adams County Farm Bureau was established for the purpose of bringing to the farmers of the county practical suggestions and information concerning every phase of agriculture. For many years the Agricultural Experiment Stations have been studying a wide variety of practical farm problems, such as soil fertility, care of farm animals, control of crop diseases and insects, orchard culture, crop improvement, drainage, marketing, etc. Much valuable information has been secured, and to make it more useful, practical, and more readily available to the farmers of the State, the so-called agricultural extension work has been outlined. Although there are many forms of the extension work, the county farm bureau represents the best avenue to secure contact with the average farmer.

The farm bureaus are supported by public funds. The Smith-Lever Act, passed by Congress in May, 1914, provided for a definite appropriation to every state, the amount being in proportion to the rural population of the state and the money to be spent through the agricultural colleges. The provision was also made that the individual states must advance as much money, dollar for dollar, as the national government. An act passed by the legislature in 1913 permits the county commissioners to appropriate as much as \$1,500.00 to take care of the local expenses. The Adams County commissioners appropriated \$250.00 to carry on the work until January 1, 1918. The rest of the money must be raised by private subscription. It is hoped that the commissioners will see fit to appropriate \$1,000.00 for the coming year. Having appropriations from

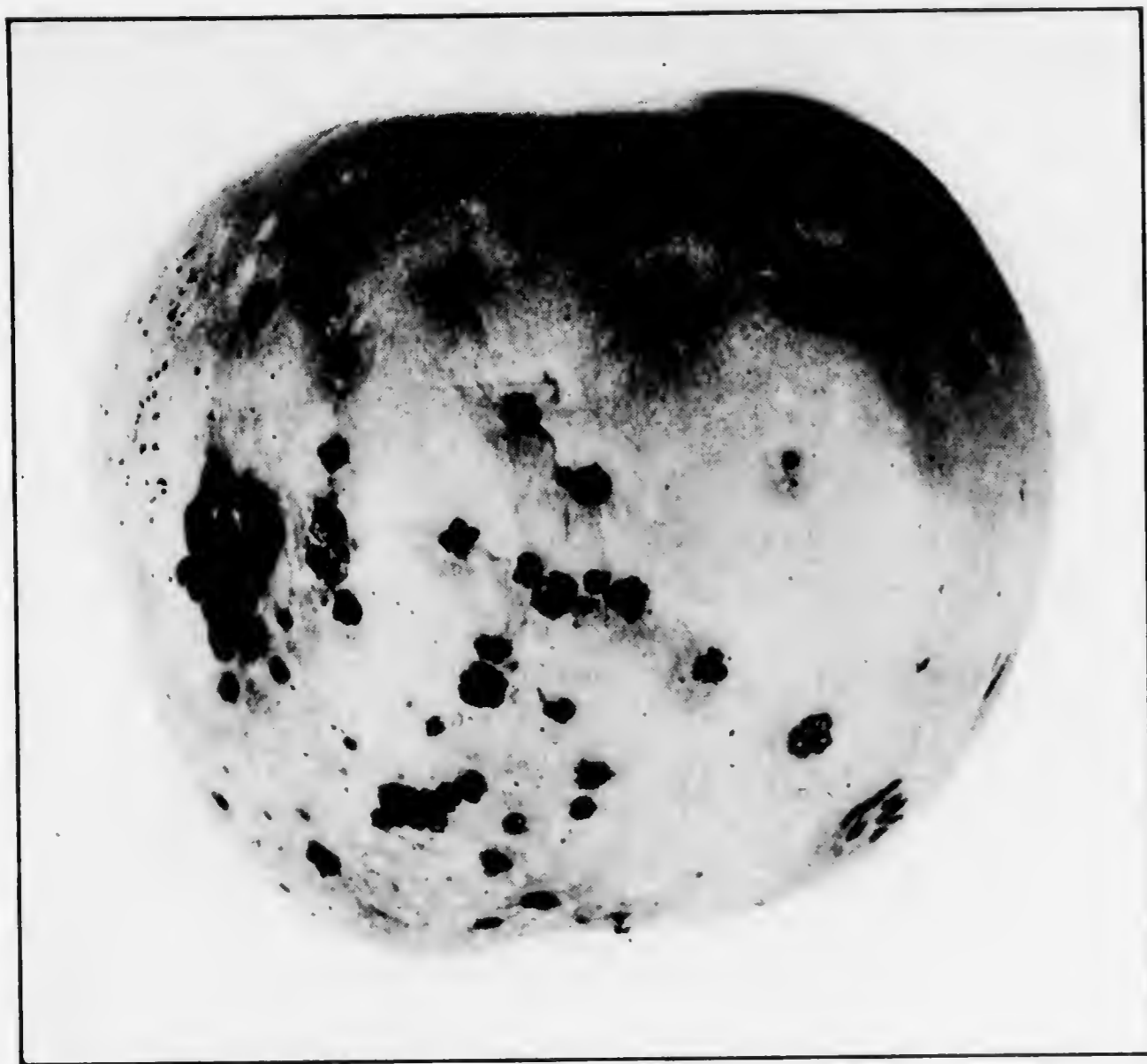


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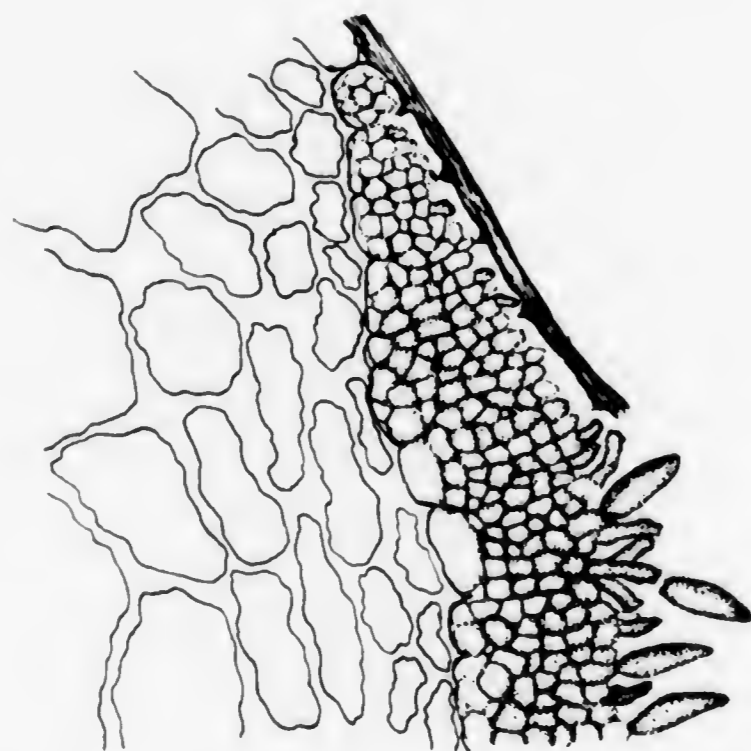


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the national and state governments and from the governing body of the county puts the work on a sound basis.

The County Agent has a machine which he uses to travel around the county. The first year's work consisted for a large part in getting acquainted with the farmers and studying agricultural conditions throughout the county. An office is provided in the court house and as there is some one there all the time, telephone calls are cared for. A great deal of time was spent last summer in individual farm visits, and in helping to work out individual farm problems.

A great many calls were received from the fruit growers of the county to help solve many different problems, and to identify different diseases and insects. Among these I might enumerate the following: Aphis, red bug, fire blight, collar blight, cedar rust, and frog eye, on apple; yellows, brown rot, scab, shot hole fungus and leaf curl on peach. These were the principal diseases for which the County Agent gave advice. He can continue to be of service to the fruit men if such calls are made for his service. The Farm Bureau will also plan to conduct several projects on spraying to control frog eye and leaf spot and probably projects along other lines if the need warrants.

The major project along horticultural lines will be a detailed orchard survey of Adams County. The Extension Department of the Pennsylvania State College plans to make an orchard survey of the entire South Mountain district, which will include Adams, Franklin, York, and Cumberland Counties, and the farm bureaus in these counties will cooperate in the work.

On the opposite page is the outline which we plan to use for making of the survey. It was drawn up largely by A. Freeman Mason, of the Extension Department of State College, in consultation with other interested parties. It is needless to go very much into detail as the outline is self-explanatory. These points, however, have been kept in mind in making the outline. The exact acreage of trees planted to date, their age and what future plantings are contemplated by individual growers. Also varieties planted, their age and their yields over a period of years. When we have the survey completed we will have something definite in regard to varieties and acreage, and it will be of value as an advertising feature. Other points are gone into in regard to management, production, profitable and nonprofitable varieties. It is planned to make the survey in such detail that when we come to summarize it we will have data that will be of the greatest importance to the grower, buyer, or to any one who is interested in fruit growing, and in Adams County in particular.

It is not expected that this work will be finished within the coming year as it requires a great deal of time to see each individual grower. The Extension Department will furnish a man to help in the work and individual growers can greatly assist by giving their

PENNSYLVANIA STATE COLLEGE.

Apples

Orchard Survey.

No.

Date

Owner, Post Office,

VARIETY.	Pre. 95 A. Trs.	95-00 A. Trs.	00-05 A. Trs.	05-10 A. Trs.	1911 A. Trs.	1912 A. Trs.	1913 A. Trs.	1914 A. Trs.	1915 A. Trs.
York,									
Stayman,									
.....									
.....									
.....									
.....									

Location,

Site and Elevation,

Soil Type,

Soil Mgmt.,

Pruning,

Spray Program,

Fertilizers,

Worst Pests,

Equipment,

CROP DATA.	1914 Bbl.Bulk	1915 Bbl.Bulk	1916 Bbl.Bulk	1917 Bbl.Bulk	1918 Bbl.Bulk	1919 Bbl.Bulk	1920 Bbl.Bulk
Total Yield,							
Amount Received,							
Cost of Production,							
Income Per Acre,							
Where and How Packed and Sold,							
Profitable Varieties (Why),							
Nonprofitable Varieties (Why),							
Per Cent. Farm in Fruit,	Per Cent. Income from Fruit,						
Chief Other Interests,	Suggested Combination,						
Remarks,							

Observer.

hearty coöperation to the County Agent or whoever comes to see them.

In conclusion I wish to say that the Farm Bureau wishes to do all in its power for "Better Agriculture" in Adams County. These are strenuous times and production must be pushed to the utmost. Whenever the County Agent can be of service to you do not fail to get in touch with him at once. The purpose of the Farm Bureau, in fact all extension work is not to force it upon the people, but to give help wherever and whenever asked. The usefulness of the County Agent depends largely upon the use which is made of him by individual farmers.

Discussion.

Member.—What questions are you most frequently asked?

Mr. Hershey.—The questions are pretty general, but have been so far, more in regard to apple growing than any other line.

Member.—Do you have in mind any particular line of fruit questions?

Mr. Hershey.—Cedar rust is one that has come up quite largely, and also a great many questions in regard to peach diseases and insects.

Member.—Can you give an outline of the law that has been passed in regard to cedar rust?

Mr. Hershey.—No, I cannot; but perhaps Mr. Goodwin may be able to do so.

Mr. Goodwin.—The law does not give any specifications, but covers the various pests and plant diseases and provides for the eradication. If a man refuses, under the present law, to cut down his trees, he can be taken before a justice of the peace, and if convicted, is fined and has to pay the costs, and is compelled to cut the trees. Or they can be cut and the bill charged to him. This law is in operation now.

Member.—How long a time is a man given after he has been notified to take out his cedar trees?

Mr. Goodwin.—He is given a reasonable time. I do not remember the exact wording of the law. If the complaint is placed with the State Zoologist he will see that it is taken care of.

Member.—Would you mind telling us what other lines of work you have taken up, Mr. Hershey? Will your office attempt to keep a list of the people who have good seed corn?

Mr. Hershey.—Yes; we will keep a list of such people so we can keep other people in touch with them. Also oats and other farm crops.

Member.—Would it be very much work for you to go to a man's farm and make an analysis of the soil of each field?

Mr. Hershey.—I cannot do it myself. A chemical analysis of the soil can be made, but you do not get very far, because you may find

your soil has plenty of potash but it is not available for plant food, as it is not in an available form. There may be plenty of nitrogen and potash in the soil, but your plants may not be getting enough, so if the plant is not getting enough of the food elements you must rely mostly on conditions of plant growth to tell you what your soil needs. In many cases a chemical analysis will show that potash is not needed in the soil, and yet by applying potash your crops are greatly increased, even though there is plenty in the soil. But there is one thing you can do. Have samples taken of your soil and have it analyzed for lime requirement. Different parts of a field will vary so much that it is not possible for a chemical analysis to give a fair analysis of your field. You must take such a small sample that it would not be at all fair to the balance of the field. What one part of the field may lack the other part of the field may have plenty of. The Experiment Station will not make a chemical analysis of soils for the reasons I have stated.

Member.—Could they tell whether the soil needed lime?

Mr. Hershey.—Yes, they can analyze the soil to tell the lime requirements. Of course there are a number of simple tests, but by analysis of your soil you can tell pretty definitely just about how much lime you need to make your soil sweet.

Member.—Will you take up any investigations in regard to smut on corn?

Mr. Hershey.—The work of the County Agent is not to do that in a very extensive way, because his time is taken up with so many different problems all over the county, but the question of corn smut is a very serious one, and the only way you can get rid of it is to remove it from the field. If it is not removed it is carried on the fodder and in the manure and thus carried over another season.

Member.—Would the same treatment apply to oats smut?

Mr. Hershey.—That will help, but will not prevent the smut being carried over in the manure if the corn fodder is fed the animals and then carried out again in the fields. One of the best ways is not to use the fodder, then take seed from a field that you know is entirely free from smut.

Member.—Will smut from corn infest the oats next year?

Mr. Hershey.—No; I think it is altogether a different smut.

Member.—Does smut make the stock sick?

Mr. Hershey.—Not unless they get too much of it. Do not believe they would get enough to injure them.

Member.—Will your corn reports show the varieties best adapted to certain sections or counties?

Mr. Hershey.—Surely. We will try to get high yielding corn, as well.

Member.—Why is high yielding corn not given prizes at corn shows?

Mr. Hershey.—Probably because certain rules have to be lived up to. I am not able to answer that. I heard an incident the other

day in which, out of ten ears of corn which had taken the sweep-stake prize, two or three ears utterly failed to germinate. That will sometimes happen. You, of course, can tell if an ear is properly dried, and if it looks good, but cannot always tell if it will germinate, and if you get one ear like that in your seed corn it will be a big loss to you.

Member.—Is white corn worth as much as yellow corn?

Mr. Hershey.—In feeding value it is. I think that depends on the section.

In our farm bureau work we never push the work on anyone, but go out and give our services when asked for. The idea is not to shove it down the the throat of the farmer, so to speak, but to give him any information when he wants it, and give what service we are able. Many questions which we come up against we are not able to answer ourselves, but are in position to secure information on the subject.

C. A. Griest.—The question of seed corn seems to me wonderfully important. I hope the work the Farm Bureau is going to do will help us to get better seed corn in the future. It is a question in my mind whether it is the right way to select seed corn to go to the crib and pick it out. It seems to me by all means it should be selected in the fall, before the corn is stored away, and then stored in a suitable place so that it can be properly dried and taken care of in the best possible manner to avoid overheating or freezing before getting dry.



Peach Cankers.

DONALD REDDICK,

Professor of Plant Pathology, Cornell University.

Peach growers in western New York have relatively little trouble with diseases of foliage and fruit. The leaf-curl disease is common enough but it can be suppressed readily by spraying. Other troubles are of so little consequence that almost no growers do any summer spraying. There are, however, some troubles of limb and trunk that require attention. They are commonly referred to as canker. Two distinct kinds of cankers are found and must be considered separately as they are of entirely different origin.

BROWN ROT CANKER.

Some years ago complaints were made from the Niagara district on both sides of the international line that black canker was very common on the larger limbs of bearing peach trees, and that the vitality and fruitfulness of the trees was seriously impaired. For some unknown reason the disease was referred to as European canker. The peach growers of Niagara County, New York, finally arranged a financial coöperation with Cornell University for an investigation of the trouble, and Dr. R. A. Jehle was assigned to do the work under the writer's general supervision. Dr. Jehle has published¹ the results of his work which are here briefly reviewed.

It was soon observed that the cankers were confined to bearing wood and that they varied in appearance from the reddish to brown sunken lesion on shoots of the current season to large, black, rough, open lesions on old limbs, the latter showing thickened annual increments of growth. When it was found that a dead spur, or the scar of one, could be found in the center of practically every canker a very strong suspicion was aroused that this trouble and the familiar brown rot disease of the fruit were very intimately related and probably caused by the same organism. Then it was found that a blighting of blossoms was not uncommon and the blighted blossom usually was glued to the twig by a mucilaginous excretion. Small sunken cankers appeared about the blighted blossom and the brown rot fungus was found fruiting on the blossoms. In the autumn blighted shoots began to appear and when it was found that a fruit affected with brown rot could be found at the base of the blighted part and that a sunken lesion encircled the shoot the evidence seemed very conclusive.

¹ Jehle, R. E. The brown rot canker of the peach. *Phytopathology* 3: 105-110. 1913.

Peach cankers and their treatment. *Cornell University Agr. Exp. Sta. Circ.* 26: 53-64. 1914.

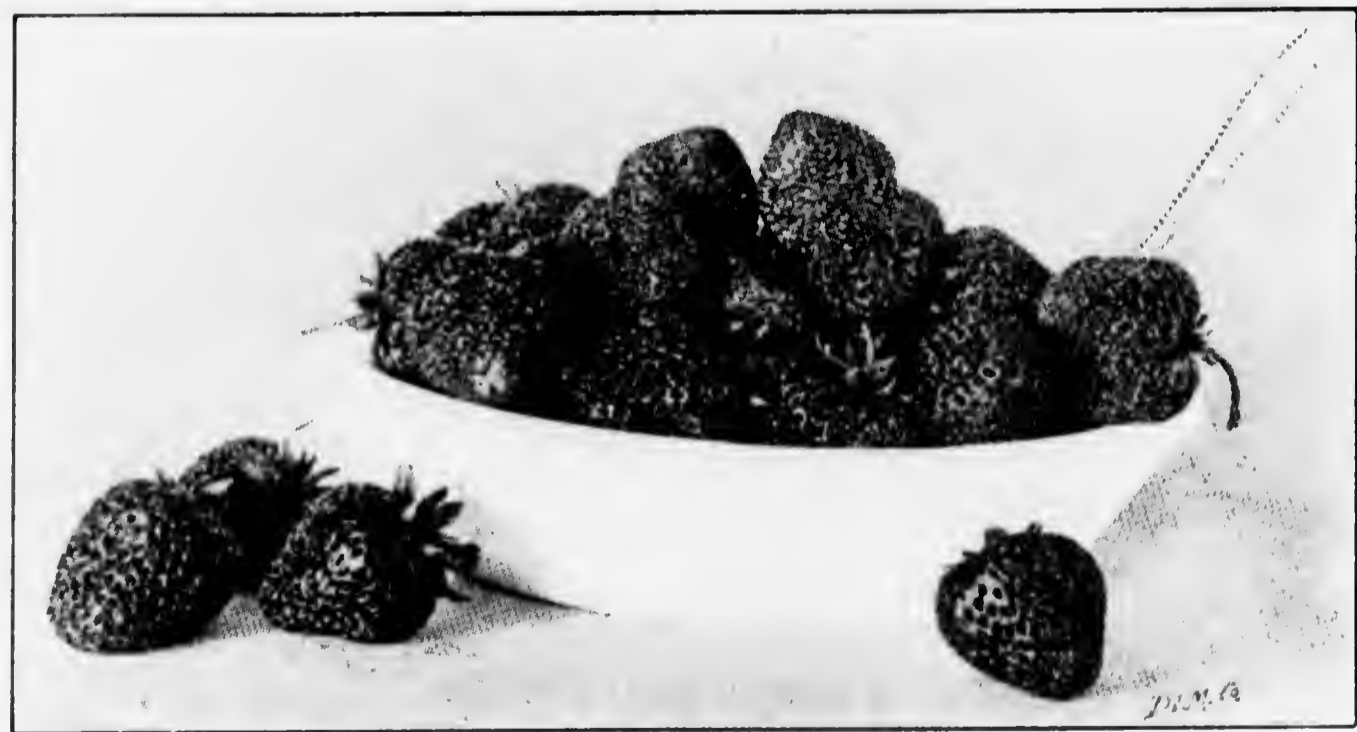
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In the meantime, however, pure cultures of the brown rot fungus had been secured from diseased blossoms from fruits, both mummies and freshly rotted ones, as well as from the affected tissues in cankers of all ages. These cultures of the fungus were used for making inoculations into healthy branches and fruits. In every case a typical lesion developed, whereas tissue injured but not inoculated, healed over quickly. The proof was conclusive that one and the same organism produced all the different types of lesion described above as well as the brown rot of fruits.

The organism, known technically as *Sclerotinia cinerea*, is best known to growers by the grayish brown tufts that appear on rotted fruits. These tufts consist largely of fruiting bodies of the fungus. The vegetative part is hidden away in the diseased tissue and is only visible by means of a powerful microscope.

A fruiting stage of the fungus not so well known is formed in the early spring on the fallen mummy. One or more pale brown, cup-like bodies issue from the fallen mummy that has been protected from drying completely, and after attaining the height of about one inch expand at the apex into a disc which sometimes measures as much as a half inch in diameter. From this cup or disc, spores are ejected in great quantities and these are carried by the wind to expanding blossoms where, if moisture conditions are favorable, an infection takes place. In the course of a few days, longer or shorter, depending on temperature conditions, the blossom blights, becomes tufted with the common gray or brownish fruiting bodies, gum exudes, cementing the blossom securely to the twig, and a sunken lesion may develop at the base.

The summer spores of this fungus are produced very abundantly and, while no examinations have been made, it is altogether probable that practically every fruit in the average orchard is well dotted with these spores and that many of the spores are viable. In spite of this it is a very rare occurrence to find rot in green peaches in New York orchards. It has been shown fairly definitely by Taylor² that punctures, such as those made by the curculio, are necessary before the fungus enters the fruit. As the fruits approach maturity the skin is more readily broken and a variety of insects may then puncture it, thus forming infection courts for the fungus.

It is an unfortunate but common practice in peach picking to leave the overripe fruits on the tree. Such fruits invariably become affected with brown rot and it is from these that many new cankers are formed since it is an easy matter for the fungus to work back through the pedicel into the tissue of the twig.

Control.

With this brief survey of the situation some practical measures for preventing the cankers will be apparent.

² Taylor, Estes P. Fighting curculio in peaches. *The Fruitgrower* 21: 84-86, Feb. 1910.

1. First of all, it should be noted that a goodly proportion of the cankers originate from blossom infection. This means that some plan of interfering with the normal development of the winter fruiting body or of eliminating it entirely is desirable. If there is no fruit rot there will be no fungus, but it will be seen that the practice of dropping overripe fruits to the ground is just about as reprehensible as of leaving them on the tree. In general, blossom blight is commonest in orchards that are not plowed before blossoming time, and it is regularly more common in grassy orchards. If the orchard could be plowed before blossoming time and dragged over one or two days before the blossoms actually opened, the amount of blossom blight might be reduced materially. Such treatment would seriously disrupt normal development of the winter fruiting bodies and would prevent the development of spores at a critical time. Spraying in the bloom might give results but the work would have to be done in a very short time, and would not be very profitable, except on comparatively young trees.

2. The second measure in preventing cankers is to prevent the brown rot of the fruit. Methods for doing this are well known, but when the disease is of so little consequence, commercially, as it is in New York orchards, not many growers will bother to employ them. But there seems no good reason why the overripe fruits should be left hanging on the trees. They might be culled out in the packing shed and disposed of in some way, or at least dropped to the ground where hogs would eat them if given an opportunity.

3. Another consideration in canker control, which is not so obvious, is worthy of attention. It has been noticed repeatedly that canker is more abundant in orchards given high nitrogen fertilization, particularly of stable manure, than in others not so treated. Growers whose orchards are on sandy land know how well their trees respond to heavy applications of stable manure, and the indications certainly are strong that the matter has been overdone in some instance. Contrary to common opinion, there is some evidence to show that the plants we commonly regard as in vigorous condition really do not have the vitality to resist disease as well as those apparently in less flourishing condition.

FROST CANKER.

Another type of canker is common in many New York orchards. It is a sunken lesion in the crotches of the main limbs, or at the base of the trunk. Usually there is a copious flow of gum, particularly in wet weather. The canker varies in extent from a small sunken area to one so large that the principle limbs or trunk are girdled. In the latter event, the tree usually puts forth leaves which remain small, later turn yellow and finally die. In the smaller cankers the bark gradually dries down and in the course of a few months white pustules appear over the dead area. These white pustules are the fruiting bodies of a fungus. *Valsa leucostoma*, which

in some localities is said to act as a parasite, and to be responsible for the trouble. Various workers at Cornell University have made inoculations of this fungus into healthy tissue, and have never succeeded in producing a lesion.

The trouble undoubtedly is a type of winter injury. It is known that the tissues in these regions are most susceptible to injury by cold and the prevalence of the trouble can be correlated with late growth and immaturity whether this is brought on by late nitrogenous fertilization or by midsummer drought followed by favorable growing weather. If winter temperatures reach a certain point, peach trees freeze to death, but if this temperature is not reached, there may still be regions where the tissues are susceptible and are either killed or very severely injured.

The last tissue to show injury from low temperature is the cambium. The young wood within and the bark without, may be frozen to death and still the cambium may retain life and give rise to new tissues in the spring. This is not an infrequent occurrence, as may be determined by sawing off a peach tree and examining for the presence of black rings in the wood.

The recuperative power of peach trees injured by freezing is as great or greater than for most other kinds of fruit trees. Tissues that appear to the eye to be dead, or nearly so, if left undisturbed, often survive. Growers are beginning to recognize this fact, and the practice of "dehorning" trees after a severe freeze is not indulged in as freely as it was a few years ago.

When the tissues in crotch and trunk cankers are completely dead and sunken and there is no possibility of recovery, the presence of the dead and injured tissue is a menace to the tree. The peach is particularly sensitive to injury, and almost any injury is followed by gum flow. Pockets of gum are formed regularly under frost cankers and it has been found that the removal of the dead tissue facilitates healing of the wound. Apparently the presence of this dead matter, which is soon infested with fungi and insects, stimulates gum flow to the detriment of callus formation.

TREATMENT OF CANKERS.

Whatever the origin of cankers, their treatment is essentially the same except that in the case of an infectious disease, such as the brown rot canker, the work must be done with care, in order to insure that all trace of the fungus is eliminated.

Whenever the cankers occur on limbs that can be removed without detriment to the tree, it is best to remove them while pruning, care being taken to cut several inches below any visible injury, as the living fungus in the brown rot canker extends back beyond any external evidence of the disease, and if allowed to remain will continue to infect healthy wood. If the cankers occur on limbs that it is desirable to save, they should be cleaned out by removing all the diseased wood a short distance back of any visible evidence of the

disease. The diseased wood and bark can be readily detected by its brown color. In the brown rot cankers it is very important to remove all this discolored tissue, as it is in this tissue that the fungus lives and if it is not removed the disease will spread. The amount of bark that it is necessary to remove depends on the extent of the diseased part. It is not necessary to remove any of the solid wood except to smooth the treated part. The wound should be pointed at the upper and lower extremities, and the bark at the edge of the wound should be cut at right angles to the wood. As soon as the wound has dried out it should be coated with coal tar. The tar acts as a disinfectant and preservative, and no other treatment is necessary. Trials have been made in order to determine this point, and it is now evident that the use of corrosive sublimate or lime-sulphur solutions in addition to the coal tar, is unnecessary.

The tools needed for such work are in the possession of every fruit grower. A good, stout pruning knife, a pruning saw, a gouge, and a mallet comprise the list.

The time required to treat cankers varies greatly with their size and condition. Small cankers readily accessible, can be treated quickly with the pruning knife, while crotch cankers, involving several limbs, may require an hour.

Discussion.

Member.—At what time in the year can brown rot spores be seen on the trees?

Dr. Reddick.—You do not see the individual spores, but if you will examine a blighted blossom, say a week after they have begun to show blight, you will see it covered with a brown powder, and if you hold it up and blow a puff of air across it, you will see a cloud of something flying away, which is the spores of the fungus.

Member.—Would cultivation just before blossoming time and burying it destroy the spores?

Dr. Reddick.—It is not a question of burying them, but of turning the mummy over so that in the process this little cup-like fungus will be broken and will not have the opportunity of casting those spores while trees are in blossom. It is very difficult to make an experiment and determine how much good you have done that way. In orchards where the owners have plowed before blossoming the amount of blossom blight is considerably less than in orchards where the plowing is done later. There seems to be that general condition.

Member.—In the case of a young orchard bearing the first crop, if all over-ripened, decayed fruit is taken out of the orchard, where will the spores winter?

Dr. Reddick.—The brown rot fungus occurs on plums, cherries, apples and perhaps on some other kinds of fruit, as well as on peaches, and it will cross from one kind of fruit to another, so that even a wild cherry tree in the neighborhood might be a source of in-

fection. The weight of one of the spores is very much less than a particle of dust you can see in the sunshine. When the spores are thrown into the air, their chances of being carried by currents of wind are fairly good.

Member.—In cutting away the diseased portion of the tree, what do you think of the advisability of using coal tar as a disinfectant?

Dr. Reddick.—On wounds where the bark has been cleaned out I have used coal tar. I refer to the tar that comes from gas works that make artificial gas from coal. I have put that material on peach trees and on all sorts of trees, and have never seen any injury to the bark from it. It sticks to the wood better than any material I know of, and its preservative effect will last for more than a year. I think there is no question but that it is a safe thing to use.

Member.—Have you allowed it to overlap the cambium?

Dr. Reddick.—Yes, and have allowed it to run down the tree.

Member.—Is there a difference in the process of making gas in the different works?

Dr. Reddick.—Yes, there is. Some places gas is made from oil, and tar that comes from that process is injurious to the tissue.

Member.—Would it be any advantage in dressing the wound to go over the cambium with shellac before putting on coal tar?

Dr. Reddick.—I should not do that. It has been done, but do not know of any advantage in doing it. We secured from as many gas works in New York as we could, samples of their product and tested them on apples. We did not have a single case of injury to apples from the use of tar that came from the various New York works where the tar came from coal.

Member.—Did you try any from the oil gas works?

Dr. Reddick.—Yes, and we had injury from that. It killed the tissue of the bark where it lapped over and around the edge of the wound.

Member.—Then it is not an absolutely safe remedy to use in the ordinary growers' hands?

Dr. Reddick.—Under these conditions I should think not, but under New York conditions, we have tested so many samples that it is pretty safe. We do not get the sort of coal tar that has oil in it, apparently.

Member.—When a crop has been lost from brown rot, what can be done to insure a crop the next year under favorable conditions for brown rot?

Dr. Reddick.—We do not have enough brown rot in New York to make it worth while to spray in summer, but where brown rot is prevalent it is regularly held in check by spraying or by dusting. The particular treatment, of course, depends on the locality.



Fig. 198. Just right to spray for codling moth. Two apples from which the petals have just fallen. The calyx lobes are widely spread.

(Courtesy of Cornell University.)

Results of a Survey of Insects Affecting Orchards in Adams County.

C. H. HADLEY,

Extension Entomologist Pennsylvania State College.

INTRODUCTION.

In March, 1917, the writer attended a meeting of this association, and at that time outlined the plans for making a survey of the insect conditions in several representative localities of the State. The Floradale (Adams County) fruit district seemed to represent average conditions, and when the plan was presented at the meeting referred to above, those present agreed that the experiment was worth trying, and offered to help out in any way possible.

The report presented herewith will show briefly the results obtained this season, and is based upon the observations and studies of Mr. J. R. Eyer, Mr. W. C. Cook, and the writer.

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Fig. 1. Apple Aphids clustering on opening buds. The most effective time for spraying.
(Courtesy of Cornell University.)



Fig. 3. Condition of blossom buds when Red Bug Nymphs first appear. Spraying should be done as soon after this stage as possible.
(Courtesy of Cornell University.)

APHIS.

There are three species of aphids present on apple trees, the grain aphid (*Siphocoryne avenæ*), the rosy aphid (*Aphis malifoliæ*), and the green apple aphid (*Aphis pomi*). Of these, the rosy aphid is the most destructive.

The grain aphid hatched first, having hatched about the middle of April. This species feeds on the outer leaves or buds of the opening clusters. They do not cause a great deal of damage, since they leave the apple by the middle of May for various grasses.

The rosy aphid was very destructive in many orchards, especially where prompt control measures were not adopted. The stem-mothers of this species commenced hatching about the last of April. This species is the worst offender, as it feeds on the foliage and young fruit, causing the foliage to curl badly and the fruit to become dwarfed and pitted. The familiar "aphis apples" show a common type of injury resulting from their work. At least three complete broods of this species developed on apples by early July, when the winged forms left the apple for their other food plant, the plantain. This species was observed returning to apple foliage late in the fall, in early November.

The green apple aphid stem-mothers hatched early in May in rather small, scattered colonies. Their occurrence was rather local, and the damage restricted to new foliage. This species remains on apple throughout the season, without causing very marked injury. The winged sexed forms appeared in large numbers during early October, and commenced laying the over-wintering eggs.

The eggs of all three species are laid on apple twigs, but the different species cannot be separated in this stage. The newly hatched lice in the spring may be separated by carefully observing the characters as given in the following key:

	<i>Grain Aphis.</i>	<i>Rosy Aphis.</i>	<i>Green Apple Aphis.</i>
Body,	Dark blackish green.	Green, with several rows of dark spots along body. Body covered with white powder, giving bluish appearance. Smaller than other species.	Lighter green with sometimes lemon-colored tinge.
Antennæ,	Very dark color, shorter than in other species.	Dark blackish color, longer than in other species.	Dusky color, especially toward the tips.
Cornicles ("honey tubes"),	Black, hardly noticeable.	Dark, long and prominent.	Dark colored, shorter than rosy aphid.
Legs,	Dark color.	Dark color.	Dark color, lighter towards tips.



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Body,	Dark blackish green.	Green, with several rows of dark spots along body. Body covered with white powder, giving bluish appearance. Smaller than other species.	Lighter green with sometimes lemon-colored tinge.
Antennae,	Very dark color shorter than in other species.	Dark blackish color, longer than in other species.	Dusky color, especially toward the tips.
Cornicles ("honey tubes"),	Black, hardly noticeable.	Dark, long and prominent.	Dark colored, shorter than rosy aphid.
Legs,	Dark color.	Dark color.	Dark color, lighter towards tips.

This season's experience has shown that in general neither lime-sulphur nor miscible oil sprays alone will satisfactorily control aphids. Tobacco solution alone or in combination, if applied thoroughly and at the proper season, will control these insects. The best time to apply this spray is just when the buds are bursting open in the spring. At this time all species of lice will have hatched, and the insects will be clustered on the ends of the buds. (Fig. 1.) We may speak of this spray as the "delayed dormant" spray, since it may replace the dormant spray, by using a combination of lime-sulphur (dormant strength) and tobacco (containing forty per cent. nicotine sulphate, diluted three-fourths pint to 100 gallons spray solution).



FIG. 2. Knotty apple resulting from red bug injury.

APPLE RED BUGS.

Both species of apple red bugs were present, but the true red bug (*Heterocordylus malinus*) seemed to be less numerous than the false red bug (*Lygidea mendax*). The former commenced hatching early in May, the latter a few days later. The young bugs puncture the tender leaves, causing a spotting and slight curling. This injury is, however, slight compared with their attacks on the young fruit, resulting in the characteristic gnarly, pitted apples. (Fig. 2.)

This season's experience showed that the most effective control was by means of a tobacco spray, applied when the blossom clusters have separated, just before the blossoms open. (Fig. 3.) This is the application commonly known as the "pink" or scab spray. The proper strength of tobacco to use is that recommended above for aphids; summer strength lime-sulphur may be used in combination if needed for scab, and arsenate of lead may be added if needed for bud moth or leaf-eating caterpillars.

BUDMOTH.

Early in the season, the tube-like hibernaculi or winter cocoons of the budmoth larvæ were very common on the terminal twigs of both apple and quince. Late in April the larvæ emerged from their winter quarters and commenced webbing and devouring the bud clusters. The damage effected at this time, however, was slight in comparison with that done by the fall brood of larvæ on the fruit itself. The larvæ attack the fruit, causing the injury shown in fig. 4.

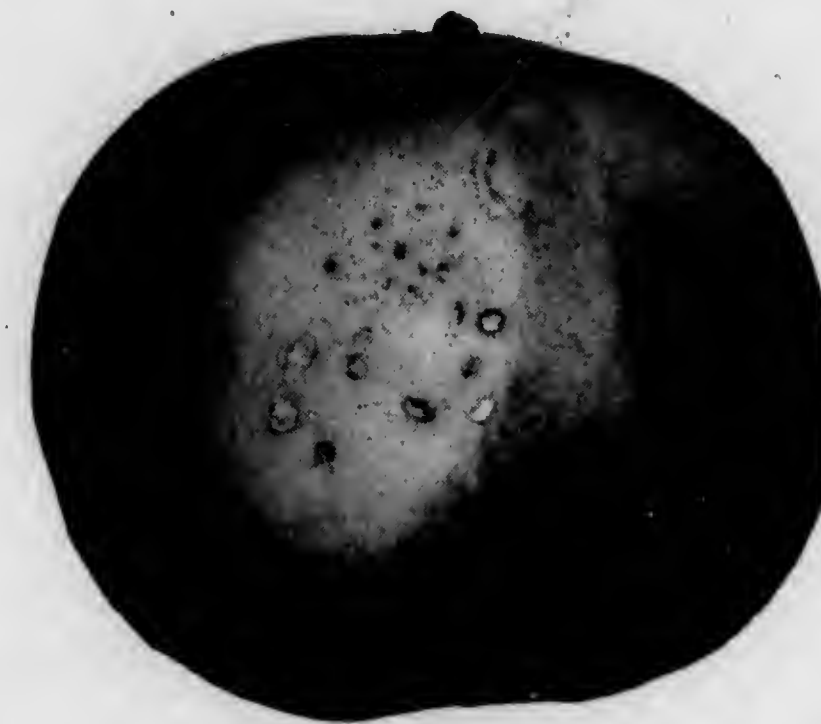


FIG. 4. Injury to mature apple caused by bud-moth larva.

Usually this pest is kept under control by the ordinary codling moth sprays, applied just after the petals have fallen, and again about two weeks or so later. A late summer spray would undoubtedly help to prevent the injury from the fall brood.

PALMER WORM (?)

A green caterpillar, superficially resembling closely the palmer worm (*Ypsolophus ligulellus*) was observed feeding in the fall on the mature fruit. The injury (Fig. 5) was more noticeable in some orchards than in others. In grading the apples at the sorting and grading tables, many apples, otherwise perfectly sound, were sorted into seconds. It is hoped that opportunity will be found next season to make a more detailed study of the insect responsible for this type of injury.

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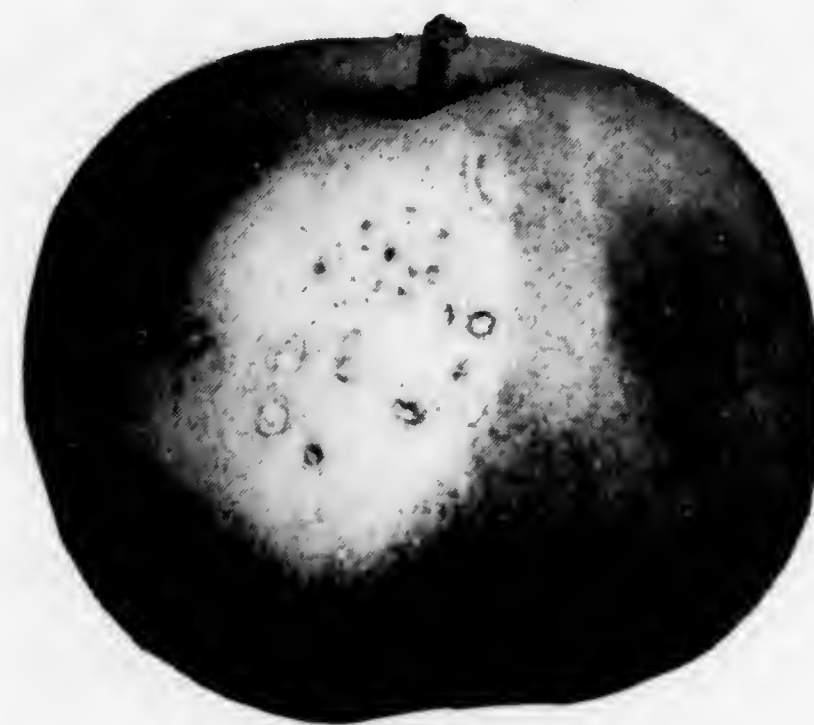


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OTHER PESTS OF LESS IMPORTANCE.

Among the other apple pests of less importance may be mentioned the following.

The codling moth (*Carpocapsa pomonella*), causes very little injury, except in unsprayed or poorly kept orchards.

The round-headed apple-tree borer (*Saperda candida*) is rather common, especially in hillside orchards. The damage done is rather local, but often infested trees become so devitalized as to become worthless as fruit producers.

The twig pruner (*Elaphidion villosum*) was quite abundant in young orchards, working in the terminal twigs. Many infested twigs were so weakened that they would break off in a heavy wind, or when brushed by the spray rig.



FIG. 5. Typical injury to mature apple caused by caterpillar, possibly palmer worm.

The yellow-necked apple worm (*Datana ministra*) often entirely defoliated young apple trees during the latter part of August. This pest seems to be quite abundant, and where necessary, could be controlled by a late summer spray of arsenate of lead.

The plum curculio (*Conotrachelus nenuphar*) is quite a common pest of plums, cherries and peaches. In some apple orchards, much of the mature fruit was disfigured by the late feeding punctures of the beetles.

The bagworm (*Thyridopteryx ephemeraeformis*) is a general pest, defoliating apple and quince trees in some orchards, as well as being commonly found on arbor vitae, locust and other trees.

PEACH PESTS.

The peach tree borer (*Sanninoidea exitiosa*) is the worst pest of peach trees; few peach orchards are free from the ravages of this insect. Consistent worming in spring and fall is the most practical method of fighting the pest, while painting the trunks with strong lime-sulphur and mounding just after the spring worming, seems to help somewhat in reducing further infestation.

The fruit tree bark beetle (*Eccoptogaster rugulosus*) has been found doing considerable damage in trees which have been weakened by borers or yellows. This insect causes "shot-holing" of the larger limbs and branches. Infested limbs should be cut out and destroyed.

CONCLUSION.

Notes were obtained on a great many other insects of lesser importance. The insects mentioned above, however, are responsible for the great bulk of the insect injury, and are therefore of chief interest to the grower.

Discussion.

Member.—What time would you spray to control curculio?

Prof. Hadley.—The usual codling moth sprays, if applied thoroughly and under high pressure, will help considerably. Where infestation is severe, late summer sprays should also be made, using arsenate of lead. Summer cultivation will also aid materially, by destroying many of the pests in the pupal stage.

Member.—Do grasshoppers do any injury?

Prof. Hadley.—Grasshoppers seldom do much damage to orchards under Pennsylvania conditions, but they do often cause serious injury to various field crops.

Member.—Do you think it is really practical to spray for aphid?

Prof. Hadley.—I think so. There are several gentlemen here who have sprayed. Perhaps Mr. Tyson will say what he thinks of it.

C. J. Tyson.—I do not think there is any question at all about its being worth while to spray for aphid. It is very seldom it can actually be 100 per cent. controlled, but I think it is a practical proposition to spray.

Member.—I have been wondering why more satisfactory results have not been obtained.

Prof. Hadley.—Men used to spraying with dormant sprays for scale are trying to cover the larger branches and trunks. When you are dealing with the aphid proposition you are not dealing only with the trunks and larger limbs, but also with the smaller tips of the branches. Therefore more material must be used per tree and a very thorough job must be done. Then too, many growers have tried to control aphids without the use of tobacco. Tobacco, as a general proposition, is necessary in order to get satisfactory results.

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Prof. Hadley.—Men used to spraying with dormant sprays for scale are trying to cover the larger branches and trunks. When you are dealing with the aphis proposition you are not dealing only with the trunks and larger limbs, but also with the smaller tips of the branches. Therefore more material must be used per tree and a very thorough job must be done. Then too, many growers have tried to control aphids without the use of tobacco. Tobacco, as a general proposition, is necessary in order to get satisfactory results.

Mr. Cohill.—We spent \$800.00 last year for "Black Leaf 40," and will never do it again. The reason is this. Two years ago we had a great deal of aphid in our orchard. We called up our State Entomologist and he said it was too late to spray for aphid. Last year we got "Black Leaf 40" all ready for aphid. Our entomologist came up and looked over the trees and said that we wanted to get busy. We got everything fixed under directions of the state man to spray for aphid. We sprayed about one-half and the other half we did not spray, and there was not a particle of difference between the ones sprayed and the ones not sprayed. We could not understand that. Apparently there was no damage whatever from aphid that year. Our state entomologist tells us that it is weather conditions. Is that true?

Prof. Hadley.—What state are you talking about?

Mr. Cohill.—Maryland.

Prof. Hadley.—I am not familiar with weather conditions down there. Weather favorable for you is not favorable for aphid, and if you can bank on getting that kind of weather you are all right. Conditions will vary in different states. Then, too, the species present in your case may not have been the rosy aphid, but one of the less injurious species. Perhaps Mr. Goodwin can say something about Ohio conditions as to the species present.

Mr. Goodwin.—Over in Ohio the rosy aphid is the one that gives practically all the trouble. They increase in numbers rapidly enough to do serious injury to the crop.

Member.—I do not think from what I saw in this section that a man would be safe in taking a gamble in not spraying.

Member.—We have sprayed with nicotine for aphid for two years, and will not take any gamble but will spray with nicotine stronger this year than last.

Prof. Hadley.—Is there anyone in Adams County who took the chance?

Mr. Brinton.—I did. I am in the lower end of Adams County, and had always sprayed. Last year I looked over the trees for aphid and found only a few on the fruit buds, so I did not spray. This year I had a beautiful crop of aphid. Next year I will spray.

Prof. Hadley.—In Lawrence County this year several men took the same gamble, not as a gamble, but because at the time the spraying should have been done, they could not get help, with the result that in one orchard in particular there was a loss of from one-fourth to one-third of the crop because spraying could not be done at the proper time.

W. C. Tyson.—Would you consider it necessary to spray if there were no rosy aphid present, apparently? I heard of a case down at the Virginia meeting last week of a man who had sprayed every year with nicotine and found he had practically no rosy aphid, and as the injury of the green aphid was so little, wondered whether he would be safe in omitting the nicotine spray.

Prof. Hadley.—I will answer that by giving you two experiences. I was in New Hampshire a few years ago and there they had an abundance of lice. They expected to find them every year, but could not see that they affected the apples, unless it might have been a slight reduction in size. I do not know that there was any rosy aphid there. It was not until I left New Hampshire and went to New York State that I learned to appreciate the difference between the species. The other experience is that of Dr. Fletcher, who has an orchard in Virginia. He says green lice are quite common there, and he has never experienced any serious injury from them. My own impression is from the common experience of other orchardists, that it would be a safe gamble under the conditions you mention.



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FIG. 2. DUSTING—A RAPID PROCESS.

The photograph shows how very large old trees are treated. The outlet pipe is moved slowly up and down and the team walks at a brisk pace. This particular Baldwin tree is unusually large and has borne twenty barrels of apples. (Courtesy of Cornell University.)

A Progress Report on Dusting.

DONALD REDDICK,

Professor of Plant Pathology, Cornell University.

It has come to be very well known that in any well-regulated experimental tests of disease or insect control the results of a single season can not be accepted with certainty as conclusive. It happens often that results are due not to a special treatment or to the use of special materials, but to some unknown factor which had not been considered.

It is for this reason that the speaker is not yet willing to come before the growers of this association with an unqualified endorsement of dusting as a substitute for summer spraying. A year ago, in an address, which has been published in your proceedings, some of the marked advantages of dusting were presented, the history of the Cornell experiments outlined, and a résumé given of the experimental evidence on which several New York orchardists were convinced of the usefulness of the dusting machine in their orchards. With that general information about dusting already before you it is only necessary now to state, as well as I may be able, what accumulated information there is bearing on the general proposition. This I am able to do through the courtesy of Dr. F. M. Blodgett, of Cornell University, and of various pathologists and horticulturists in other states. Dr. Blodgett has kindly furnished the facts for the

compilation of table 1, but I am not in position to present for publication many of the facts about results in other states.

APPLE DUSTING IN NEW YORK IN 1917.

All of the work in 1917 was done by the growers themselves, but in many instances they had the advice or assistance of extension workers in plant pathology.

Several hundred dusting machines were purchased for use in western New York in 1917, and most of them were used to some extent. The very unfavorable conditions existing throughout the apple section, however, make it impossible to present a satisfactory report. If possible the weather conditions were more unfavorable for all orchard work than in 1916, and in addition the set of fruit was so poor that in the majority of cases no records could be obtained. How unfavorable the conditions were may be seen from the table which shows percentages of clean, scabbed and wormy fruit. It should be stated in this connection that the nine records shown in the table were taken from orchards owned by some of the best fruit growers in the state.

It will be seen that apple scab was exceedingly abundant, and that neither dusting nor spraying gave very satisfactory results. In five of the nine orchards, scab control is favorable to the dust method although in some cases the difference is negligible.

In the case of codling moth it is to be noted that practically all the damage done by this insect was from side entrance by the larvæ. There is considerable question whether any of the treatments given reduced the injury from this source. In some instances the number of fruits damaged in this way is greater in the treated plats than in

APPLE DUSTING AND SPRAYING RESULTS IN NEW YORK IN 1917.

VARIETY.	UNSPRAYED. Codling Moth.				SPRAYED. Codling Moth.				DUSTED. Codling Moth.			
	Sound.	Scab.	Side.	Calyx.	Sound.	Scab.	Side.	Calyx.	Sound.	Scab.	Side.	Calyx.
Baldwin,	34	64	4	2	72	27	.6	.1	73	24	2.8	.1
Baldwin,	23	69	16	4	59	38	5.0	.5	61	36	2.0	.1
Baldwin,	27	15	63	12	58	12	32.0	3.0	28	34	45.0	9.0
Baldwin, .....	.....	.....	.....	.....	53	36	14.0	.5	65	10	26.0	3.0
Greening,	44	53	3	2	65	34	1.0	.3	57	41	2.0	.4
Greening,	5	88	20	9	25	67	17.0	2.6	24	58	23.0	8.0
Greening, .....	.....	.....	.....	.....	51	23	31.0	1.6	39	21	47.0	5.0
Blush Greening,	23	58	26	12	51	40	10.0	2.3	57	36	8.0	.6
Twenty-ounce,	39	33	31	8	49	30	24.0	2.0	36	44	24.0	5.0
Alexander,	57	31	14.0	.2	37	30	31.0	5.0
Yellow Transparent,	67	9	24.0	76	7	15.0



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the untreated ones, and the wide variations noted perhaps may be best accounted for by fluctuations in the prevalence of the hibernating insects.

The fluctuations in the amount of codling moth injury make the figures under the heading of *sound fruit* open to question. In general it must be concluded that dusting and spraying showed equally poor results.

EXPERIMENTS WITH APPLES IN OTHER STATES.

Experiments in dusting apples are in progress in at least eight states. In most cases there are no published data so that what is said here orally is based largely on personal information and can not be set down for record.

Work in Illinois in 1915, by Watkins,¹ shows that dusting of two varieties (Willow twig and Ben Davis) gave better control of scab than did spraying with bordeaux mixture. Blotch (caused by *Phyllosticta solitaria*) was present in the check blocks of the two varieties to the extent of 77 and 57 per cent. respectively. Bordeaux-sprayed plats showed 10 and 4 per cent. respectively, and dusted plats 20 per cent. each. The marked reduction in the amount of blotch in the dusted plats is of special interest, because, ordinarily, the disease is not thought to be amenable to sulphur treatment. Reports made at the Illinois Horticultural Society a few weeks ago, however, show that lime-sulphur solution is effective for the disease. The dusting results, therefore, are to be regarded as reliable.

Experiments in Illinois² in 1916, showed dusting to be considerably less effective in control of diseases than was spraying. Insects, including curculio, were controlled as well by dusting as by spraying. It is suggested that dusting will prove of value only in orchards of such extent that they can not be protected satisfactorily by spraying.

In Ontario Cæsar³ has secured very satisfactory results from dusting. His recorded figures show better control of apple scab than was secured in most of the Cornell experiments. Professor Cæsar has stated in a letter, however, that he is not willing to endorse the dusting method without qualification. This is due to the fact that some of his colleagues in the Dominion have been unsuccessful in their experiments. In Ohio, Gossard⁴ has reported on some preliminary dusting experiments and has secured such favorable results that he "believes there is enough promise in the method to make further experimentation obligatory."

¹ Watkins, O. S. Results of spraying experiments for 1915. Neoga Station, Cumberland County. Trans. Illinois Hort. Soc. 1915: 202-209. 1916.

² Gunderson, A. J. and Brock, W. S. Field experiments in spraying apple orchards in 1916. Univ. Illinois Agr. Exp. Sta. Circ. 194: 1-15. 1917.

³ Cæsar, L. Dusting fruit trees and grapes for the control of diseases and biting insects. Ent. Soc. Ontario, 47 Ann. Rept. 1916: 31-43. 1917.

⁴ Gossard, H. A. The dust spray for apple orchards. Ohio State Hort. Soc. Rept. 15: 37-40. 1917.

Following is an extract from a letter received from a former co-operator in the dusting work. It shows very well the feeling of one successful grower in the Hudson River Valley.

STUYVESANT FALLS, N. Y., October 12, 1917.

My Dear Professor Reddick:

This makes the third season that I have used dust extensively. This year I used more than ever before, and dusted on ten farms; something in the neighborhood of 1,000 acres of bearing fruit, and I suppose 200 or 300 acres of young trees.

One must understand the difficulties that a grower contends with in the way of inexperienced help, or none at all; soft ground, bad weather, and heavy land; cranky engines, leaky pumps, and the many other things you know about,—to appreciate the great advantage that dusting has over the liquid method. It would have been impossible for me, and several of my neighbors, to have protected out fruit by any other method, and now that we are picking and packing, our satisfaction with the results is even greater than our appreciation of the ease of operation that we experienced in the springtime.

The fruit on dusted orchards, with hardly an exception, is free from codling moth and fungus (scab), to an extent that we estimate at at least twenty-five per cent. over the orchards that were sprayed.....

I used this year, principally, a dust of 50 sulphur, 10 lead, and 40 tobacco. The results on red bug and psylla were hard to determine; on aphids they were good; but none of the ingredients were of a sufficient fineness to give the best results.

Very truly yours,

EXTENSION OF DUSTING TO OTHER HORTICULTURAL CROPS.

Peaches. The reports from all sources with respect to peach dusting show that the method is entirely applicable in the control of curculio (*Conotrachelus nenuphar*), of brown rot (caused by *Sclerotinia cinerea*), and of scab (caused by *Cladosporium carpophilum*). The time of treatment and the materials are the same as for spraying with Scott's mixture. There is no danger of discoloring the fruit if the dust is applied properly and a treatment can be made nearer the picking time than with the spray. Various combinations have been tested but more work is to be done before the best combination can be recommended with certainty. Obviously the percentage combination of the essential ingredients will fluctuate, depending upon the amount of material applied per tree. The following formula will give results if a half pound of the material is applied per tree each time: 80 parts sulphur, 10 parts arsenate of lead, 10 parts hydrated lime; when arsenate of lead is not needed substitute an equal quantity, by weight, of hydrated lime. The hydrated lime may be regarded as inert material or filler, but it is useful in preventing burn from arsenate of lead and when the poison is not included the lime is desirable to improve the flowing qualities of the mixture.

Grapes. Cæsar, in the article referred to above, has also reported favorable results in the control of grape mildew (caused by *Uncinula necator*) by dusting. It appears, however, that he worked with hybrid varieties. In the Chautauqua district of this State and

of New York, according to the experience of Gladwin and Reddick,⁵ sulphur can not be used safely on varieties of American origin.

Small Tree and Bush Fruits. During the past season Dr. V. B. Stewart has continued his work in dusting nursery stock. The disease mentioned in the report of last year has again been held in check by a sulphur dust treatment, and there is no reason to believe that similar results could not be obtained in the orchard. In fact some New York cherry growers used the method in 1917 with very satisfactory results.

The black spot disease of roses (caused by *Diplocarpon rosæ*) has been added, by Dr. Massey,⁶ to the list of diseases controllable by dusting. This is a matter of considerable interest to rose growers, since it has been difficult in many cases to spray rose bushes on account of their proximity to buildings and so forth.

FUTURE OF DUSTING.

It is impossible to predict what may be the future of dusting. Due to the unprecedented shortage of labor it would not be at all surprising to see apple growers take up the method very extensively in the next few months. If dusting of apple trees becomes a common practice it may be assumed without much question that the practice will be extended to a variety of other horticultural crops. Experiments with dry insecticides and fungicides will become common, and it is not too much to expect that in such an event dusting will be the rule rather than the exception. If dusting becomes at all popular there are sure to be many developments in the way of new materials and improved methods. Perhaps one of the first changes to come will be the production of sulphur in a much finer state of division than is at present obtainable. Theoretically this is desirable and experiments to prove that it is, doubtless will necessitate the development of a method of producing it.

Another development that may be expected is in the production of a machine having a positive pressure blower. This would allow for the use of a nozzle with which the flow of dust could be directed more accurately and perhaps with some economy of material.

The one thing that would contribute most to the popularity of dusting would be the discovery of a dry contact insecticide. Work is in progress on this phase of the problem but it is too soon to expect anything more than a mere indication. The number of materials that might be tested is large, but progress is slow because reliable experiments are very expensive, each material must be tested in a preliminary way and usually only one test per year can be made.

From the standpoint of disease control there is the problem of finding a material that is effective against such diseases as bitter

⁵ Gladwin, F. E., and Reddick, Donald. Sulphuring Concord grapes to prevent powdery mildew. *Phytopathology* 7: 66. 1917.

⁶ Massey, L. M. Experiments for the control of blackspot and powdery mildew of roses. *Phytopathology* 8: —. Jan., 1918.

rot. A copper compound, already available on the market in powdered form, should be tested, and aside from this there is a variety of materials that might prove effective.

Discussion.

Member.—What time do you dust for peach leaf curl?

Dr. Reddick.—The time of treatment would be the same as for spraying, but I think any dusting that is done ought to be in an experimental way. I would not rely on it. With us we tried to get as much spraying done this last month as we could, and what was not done then will be done as early in the spring as we can get at it.

Member.—What was the dust you were experimenting on for control of leaf curl?

Dr. Reddick.—I have only used two materials, the sulphur and lead mixture and powdered soluble sulphur. They are the two materials I have tested.

Member.—Would you recommend using lime-sulphur as a dormant spray on grapes?

Dr. Reddick.—There would be no object in using lime-sulphur as a dormant spray on grapes.

Member.—Miscible oil will take care of scale on grapes.

Member.—Referring to peach leaf curl, has it not been determined by experiment stations that fall is the best time to spray?

Dr. Reddick.—It has been the determination in New York that fall is the time, and that is not because you can control curl any better, but because you can get into the orchard so much better. You get a higher percentage of control by fall spraying than by spring spraying, but that is because conditions are so much more favorable for the job.

Member.—In your apple spraying do you use 85—15?

Dr. Reddick.—No; in our dusting we are using a mixture containing only ten per cent. arsenate of lead, and in the treatments where it is not necessary to use the lead we either put on pure sulphur, or use an inert filler, either tobacco dust or finely powdered gypsum.

Member.—Do you think it necessary to have the fifteen per cent arsenate of lead?

Dr. Reddick.—I do not think it necessary to have fifteen per cent arsenate of lead, particularly when you have so very little codling moth.

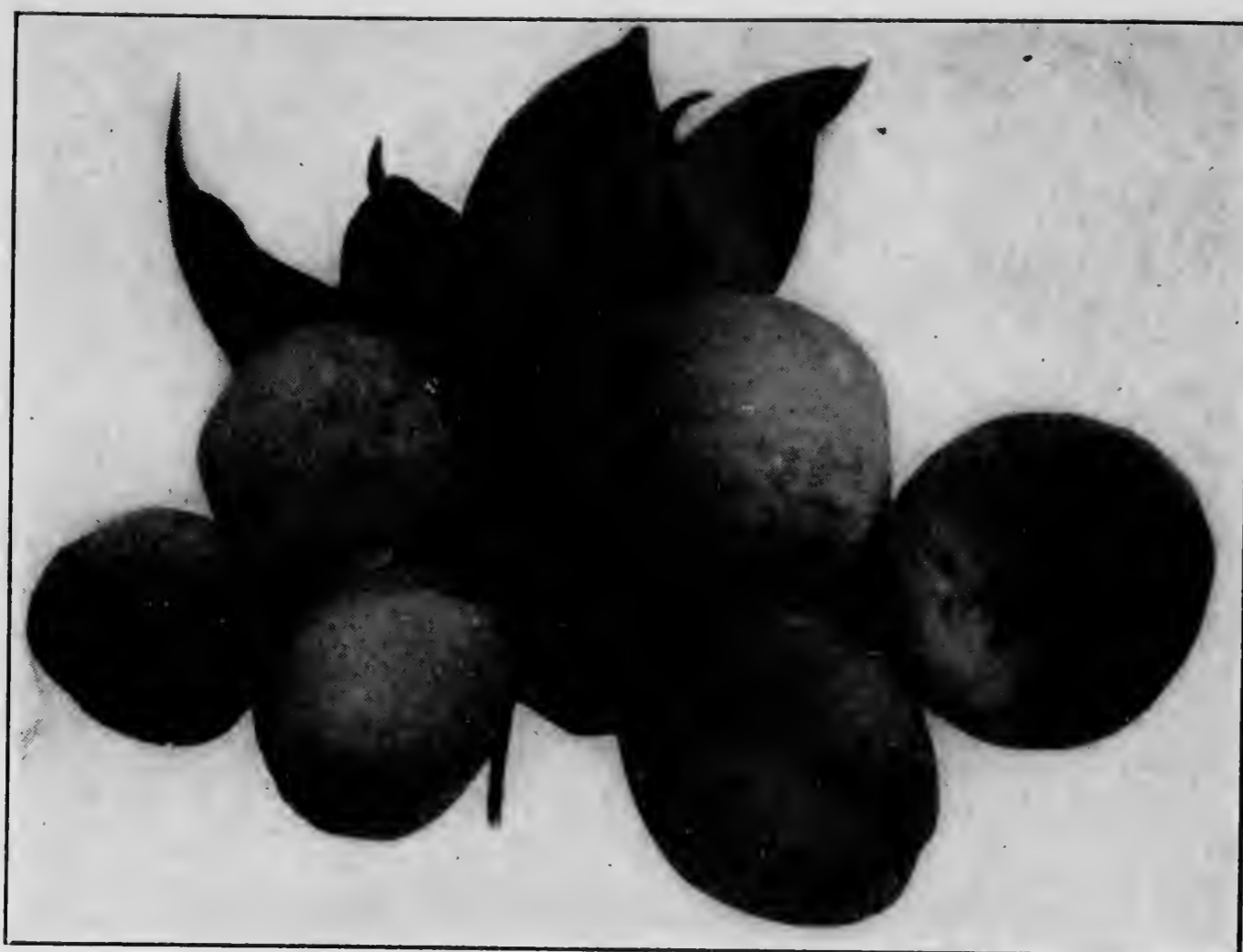


FIG. 7.—Average size specimens, from an unthinned peach tree (on the left) and from a tree thinned 4 inches apart (on the right).

Growing Peaches in Connecticut.

MR. A. T. HENRY,
Orchardist, Wallingford, Conn.

Mr. President and Members of the Fruit Growers Association: I expect many of you feel the same as I do when you attend these meetings and a speaker gets up before you; you like to know, perhaps, how familiar he is with his subject, and whether he read it out of books or has had practical experience.

As I am not personally acquainted with most of you here, would say that I live on a farm, and have lived on a farm all my life, and hope to continue to live there. I worked in a peach orchard in Michigan one year, and after that I had the pleasure of working for Mr. J. H. Hale for three summers. After that we picked out our farm, and for the past twelve years have been attempting to grow peaches, apples and cherries.

Whatever I say here to-day is the result of practical experience and not to give any advice as to what should be done, and as conditions affect fruit growing in all sections of the country, I will tell you what our conditions are.

We are on large, sloping hillsides about eleven miles from Long Island Sound, at an elevation of from 200 to 300 feet. A valley runs up quite near to us, so that the hills drop off practically to sea level. The soil is quite stony—round cobble stones in our particular

section, is rather a sandy loam, and washes very easily. That has a great deal to do with the way we handle our orchards. The hillsides generally are naturally covered with a growth of brush, cedar and some chestnut, although quite a little has been killed by chestnut blight disease.

We took a farm about twelve years ago, as stated, and perhaps the best way to give you an idea of the operations there will be to take a piece of this rough land and follow it all the way through from the time it was in woods until it has produced a crop of peaches. The operations of clearing the land would be the same in any section of the country—cutting off brush and burning it. After that the land was marked off in rows for the peaches from eighteen to twenty feet apart each way. In our own case we planted peaches among the apples about thirty-six to forty feet apart, and three peach trees to the apple tree. We tried to take pains in getting the rows of peaches straight. Many people think no more peaches will grow on straight rows than on crooked rows. Perhaps that is true, but the man who takes pride in his work is the man who generally succeeds.

On these hillsides we only cultivate one way. Have the rows straight up and down then across the hill, so as to bring the rows as level as we can. We try to dig large holes for the trees, perhaps two feet in diameter if we can, and dig it as deep as we have the nerve to, from six inches to one and one-half feet. We then fill in the holes with good loam.

Member.—How about using dynamite?

Mr. Henry.—We have never tried dynamite except in one case in a roadway where the soil was packed down by several years of travel on the road, but the trees did very well. It is necessary to be careful not to put in too heavy a charge. Just a medium charge to shake and loosen up the ground is better than a charge which blows a great hole or pocket in the bottom of the hole.

If I could I would like to have the young peach trees propagated from bearing trees. Wherever possible when we have had time we have gone to healthy trees and cut buds and sent to a nursery and had trees propagated from these trees, which we absolutely knew were all right. I am positive that a great deal of yellows comes with nursery stock. To prove that, in one of our own orchards about two years old, quite a few trees died, and in these missing places we bought nursery trees and planted them, and by the time the orchard was four years old all of the replaced trees, which were two years old, had yellows and had to be taken out, and the older trees showed no symptoms of yellows at all.

When we have to buy trees we like to get trees of about medium size and strong growing trees. One thing we try to do is to hunt for borers before the trees are planted. If you get the borers out of the trees then you have the borers out of your orchard. We dip the tops of the trees right into a barrel of lime-sulphur then we have the trees sprayed for the first year.

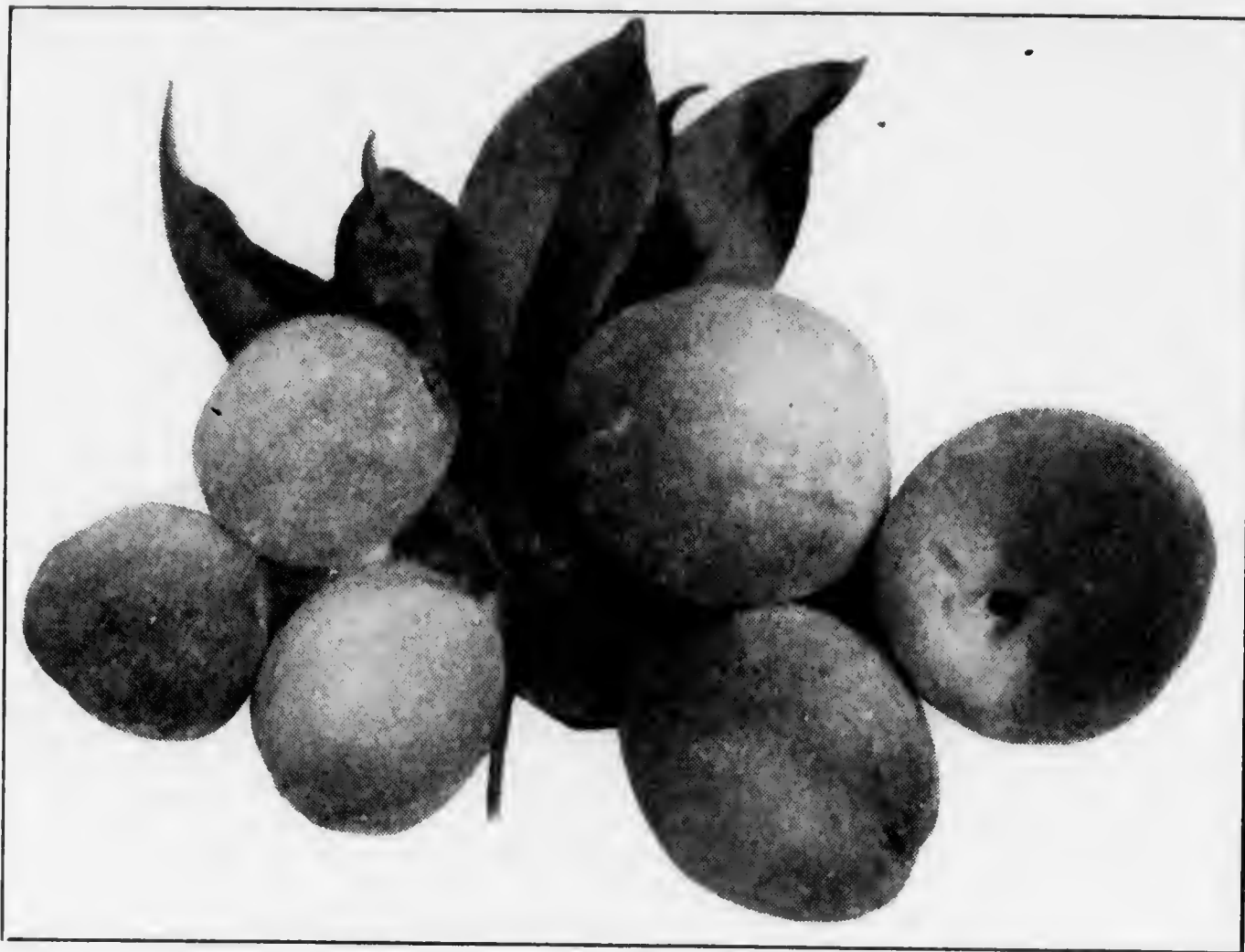


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Member.—Why not spray the roots?

Mr. Henry.—I would not spray them. There is nothing to spray them for that I know of. I would be afraid they would not grow. There is nothing on the roots.

Then we plant the tree in the hole about as deep as it stands in the nursery and try to work the ground around the fine roots and stamp it very hard with the heels of our shoes, but leave the ground loose on the top. We do not put fertilizer of any kind in the hole with the tree. After the tree is planted we spread nitrate or a good commercial fertilizer on top, but under no conditions allow fertilizer in the hole with the tree. It can be done and has been done successfully, but there have been a great many more trees killed by putting fertilizer in the hole than have been benefited. We get a great deal better results by spreading fertilizer on top of the ground. I like to have the ground good and loose in the hole then take the tree and put it right down in it. We take our hands and work it in tight then use a shovel or our heels and stamp the ground just as tight as we can. The object is to get the ground up tight all around the roots of the tree so they do not dry out.

We try to keep the ground well cultivated the first year. In some cases we plant crops in among the trees and our trees have generally done very well where we have had corn. With us there seems to be something about corn that is very beneficial to trees. Personally I think corn keeps the wind from whipping the young trees around and some do very well where we grow sweet corn or flint corn around the trees.

Member.—How many years do you continue crops?

Mr. Henry.—Up to two or three years; not over three years.

Then they should be mounded up in the fall. We mound them up to protect them from mice and rabbits. The soil is fairly loose and if we do not do that the strong winds will whip them around and let the water in around the trees where it may freeze. Banking them up with ground will keep the mice away and keep the wind from whipping the little trees about. In the spring the bank is taken down and the trees are cultivated and whether fertilizer or not depends on how much they grew the first year. We do not want the young trees to grow too fast. I have noticed a good many orchards and where they have made a growth of five or six feet when they are young they generally have not been very long lived orchards.

The second and third year a lot of small branches will come on the inside and we are very careful not to cut these branches out. The third or fourth year is the year you are going to get your fruit, then those branches will die and can be cut out.

Peach trees should be sprayed either in the fall or in the spring with lime-sulphur. For three years it has been our practice to spray in the fall, during November and December, with lime-sulphur. We had our orchards about three-fourths sprayed when that cold snap came on about three weeks ago.

Member.—Does it not hurt the fruit buds to spray in the fall?

Mr. Henry.—I do not see how it would. We have done it for three years and have had a crop every year just the same as when sprayed in the spring, and it is much nicer to get around in the orchard in the fall than in the spring.

On certain varieties we get quite a crop when three years old—Greensboro, Carmen and some others. Elberta, not until four or five years old. If they have a crop on it has been our practice to summer spray them once when about half grown, after the June drop and when the size of a small hen's egg, or about the size of a walnut, spraying with self-boiled, Scott's Lime-Sulphur, being careful not to cook the mixture too long. Great care has to be taken in cooking this mixture not to boil it too long. Put eight pounds of lime and eight pounds of sulphur in the bottom of the barrel. Mix them up together in a stiff paste and let stand for perhaps five minutes. When it starts to turn orange color throw in several pails of cold water and stop cooking. This mixture is to control brown rot, and if you have curculio put in arsenate of lead and it will control that too if applied early when the shucks are falling.

Soon after the peaches are sprayed we try to thin them, and the amount of thinning done depends altogether on how much help we have and how thick the fruit is on the trees. In thinning, I have never had anyone take too many peaches off the trees. Very often myself I have left too many on. I do not think peach trees should be allowed to bear over fifteen of our baskets, seven and one-half bushels. It is better for the tree if they are not allowed to bear over that, and it is surprising what a small tree will bear that amount of peaches. We find that thinning pays fully as much as any orchard operation we do. It saves the vitality of the tree and we get just as many bushels of peaches as if we allowed them to hang on too thick.

We have tried a great many kinds of peach graders but have never found any that we liked. I think where the fruit is carefully thinned on the trees it saves practically all of the work of grading, as the fruit is really graded on the trees.

In regard to packing the fruit, we try to pack it according to the market to which we are going to send it. If sold on nearby markets of course it has to hang longer than if shipped a considerable distance. We use the regular half bushel peach basket for picking in the orchard, which has a strap across the shoulders and hangs in front of the picker, allowing both hands free to pick off the tree. We pick several times, according to variety. We pick Champion as many as eight times and sometimes two or three pickings for the Elberta. We like to pick them off two or three times, but if the land is pretty even and they are fairly ripe, they can all be picked off at one picking.

Member.—Is that a shipping proposition you have in mind or delivered by truck?

Mr. Henry.—Most of our fruit is sold the day after picking. It

depends on where we are going to sell them how hard they are picked. We generally try to sell some fruit to go quite a distance then hold the last for nearby markets. The fruit that is shipped away we pick quite hard then let the others hang until ripe, and in that way extend the season. Our markets are mostly close by. We are eleven miles from New Haven, thirty miles from Bridgeport, fifty miles from Springfield, so that there is a great consuming population nearby, and we perhaps let the fruit hang longer than if farther from market. It ought to hang just as long as possible.

After picking the peaches are hauled to the packing house in spring wagons and there the white varieties are generally sorted. The Champion vary a great deal in size. The Elberta we have generally not found it profitable to sort. They run very even in size and are just poured from one basket to another. The soft ones and leaves are taken out and they are fixed up a little, the color turned up, and are put on a truck and taken down to cars and shipped by train or trolley. We have shipped a great many by trolley, which has been very satisfactory.

Member.—What is your system of pruning after trees come into bearing?

Mr. Henry.—After trees come into bearing we try not to let them get too high. We aim to cultivate the orchards about the width of a springtooth harrow. We are using at the present time six-foot pruning shears. We do not let the trees get any higher than we can reach with the six-foot pruning shears. If any limbs are starting to grow up strongly we cut those back with these shears and then we take large shears or saws and go through and cut out some of the larger limbs. The idea is to keep the trees low down so they can be reached from the ground or a short step-ladder. I do not think we prune our peach trees enough, and I think other orchardists have made the same mistake. We forget that to get peaches we have to get wood, and to get wood the trees must be stimulated and forced to grow, and one method to force them to grow is to prune them.

Member.—When do you prune?

Mr. Henry.—We are pruning now.

Member.—Do you prune in summer time?

Mr. Henry.—We did but I do not like it. The only advantage I know is that they bear heavier, and they will bear enough anyway. If the trees were very thick and the fruit did not color up I think it would be all right to go in and thin them out, but we aim to keep them thinned so the sunshine and air can go all through them. We have no particular system, and we go in and, you might say, slash the trees. We are not afraid to cut them. The more you cut them the more they will grow. Cut them hard and it will make them grow and you will get much finer fruit. Cutting large branches will force the smaller branches out and that is where you have the nice peaches. We are pruning now. We generally do not start as early as this but the ground was covered with snow at home and there was not

much else we could do. In connection with pruning, we got onto a little thing last year that saved us a great many dollars. In picking up peach prunings we use a small sled, picking them up by hand. Last year we tried to use an ordinary hay rake but it did not do very well, and I studied a great deal on it, and one evening in looking through one of Sears & Roebuck's catalogs I happened to notice an old-fashioned dump rake. I think it cost \$6.35. Anyway, I decided to blow that much in and see if it would not gather those peach prunings up. We went through the orchard with a fork and pitched the branches out in the centre of the rows and then went right down the rows with the old-fashioned hay rake and it would gather the branches all up. It saved us more work than any tool on the place. It was a hard job to pick up peach prunings for days at a time.

Member.—How do you attend to borers after you have planted the trees?

Mr. Henry.—The way to attend to them is to attend to them before the trees are planted. Keep them out until the trees are three or four years old and then we do not seem to have any trouble. Several of our orchards we have not had men in to hunt for borers for six or eight years. There is grass grown up around the trees but the borers do not seem to bother these old trees at all. The best way is to get them out when the trees are young and keep after them. If you go over them once and find them, go right over them again and get them out. There is no way that I know of except to take a wire and triangular scraper and dig out around the base of the tree with that, and then take a sharp jack knife and dig them out then lay them on a stone and pound them with another stone until you know they are dead.

We keep track of what the different pickers do. It is hard to tell what a man will average. We had some average not over twenty bushels a day, then some good pickers will pick up to 100 bushels a day, depending on how the peaches are running.

Member.—Have you done any dusting?

Mr. Henry.—No, we have never done any dusting. We have used all liquid spray. I think it is all right and will perhaps try it another year.

Member.—What time do you spray for peach curl?

Mr. Henry.—Any time before they have started in the spring, but spray real early if you do spring spraying. I would like to have them sprayed now. I much prefer fall spraying for peach trees if we can.

Member.—Have you ever lost peach trees from bark freezing?

Mr. Henry.—No, we never have. Since our orchards came into bearing the temperature has not been lower than ten degrees below zero.

Member.—What are your varieties?

Mr. Henry.—Our principal varieties have been Greensboro, Carman, Belle of Georgia, Champion and Elberta. The way to make

money on a peach orchard is to select the right varieties. We planted late Crawfords and Fox Seedlings. They did very well for the first two or three years but did not do so well later. The Mountain Rose used to be a fine peach in Connecticut but has run out. None of the growers in our state now have any success with the Mountain Rose peach and it used to be one of the very best ones. One of our most profitable varieties is the Champion. The tree is very strong and thrifty and the fruit is very large and fine flavored. They ripen over quite a long period—two weeks perhaps—are a very tender and soft peach, and where they have to be shipped would not do so well, but for a local market I think they are the very best. We have had lots to bear twelve and one-half bushels to the tree.

By the way, when I worked for Mr. Hale I offered to give him my summer's work for one of the J. H. Hale peach trees, but he would not do it. I really think the Hale is a very good peach. The Belle of Georgia is a very profitable peach with us. Then comes the Elberta. The only trouble with the Elberta and Belle of Georgia is that they come so close together. Then come Fox Seedling and Iron Mountain.

Member.—How do you find the Iron Mountain?

Mr. Henry.—They are a very nice canning peach. If New York State has a very heavy crop of peaches they are not very profitable for us. They are not a very attractive peach but are fine flavored. Unless the season is pretty early with us they do not do so well.

Member.—Do you grow Salway?

Mr. Henry.—No, we never had a Salway on the place. Do not know anything about it. We had quite a block of Stump but pulled them out.

Member.—Is the Hale larger than the Elberta?

Mr. Henry.—Yes, the Hale is a large peach if thinned well. It looks just as if it had been painted and powdered. Maybe it will stand watching, I do not know.

Member.—Do you grow the Hiley peach?

Mr. Henry.—Yes. The Hiley is a good peach but the Champion does better for us. I have never seen a good block of Hiley. The trees with us do not get very large. The Hiley is a very attractive peach, of very fine color. In fact, it is the only peach I know of that you can let hang on the tree longer than you think it ought to. They are not very fine flavored; are very freestone and we find the skin will slip off just as though they had been dipped in lye.

Member.—Do you know anything about the Rochester peach?

Mr. Henry.—Yes. They remind me of the Yellow Champion. They have the same characteristic of ripening over a long period. They are a large, round, yellow peach. It looks like a promising peach and I think is a good bearer.

Member.—How old are your trees?

Mr. Henry.—Two years old. They bore a few peaches this year.

Member.—Do you know the Mathews Beauty?

Mr. Henry.—Yes, we had some of them and pulled them out. They were not a good bearer with us.

Member.—Would it be necessary to spray peach trees in the spring after being sprayed this fall for leaf curl?

Mr. Henry.—I do not think so. The trouble with most of it is that we do not kill it the first time. It should be sprayed thoroughly. We spray from two sides at different times, waiting for wind to change.

Member.—Do you spray against the wind?

Mr. Henry.—We spray altogether with the wind. Do not spray against the wind at all.

Member.—What kind of packages do you use?

Mr. Henry.—Fourteen quart baskets and bushel baskets. We tried to use carriers but nobody knew how to pack carriers so we pack right in the fourteen-quart baskets.

Members.—Do you sell to commission men?

Mr. Henry.—We generally pick out one man in town and sell to him. Have found commission men very satisfactory. Must know who you are sending to and keep close watch on them.

Member.—What do you think of Powdered Soluble Sulphur on peaches?

Mr. Henry.—We have never used soluble sulphur at all. We use nothing but the concentrated lime-sulphur. We make it ourselves. Have two large tanks eight feet long and four feet wide. We make up seven barrels of this concentrate in each tank. We make it as we use it, boiling seven barrels at a time.

Member.—What kind of arsenate of lead do you use?

Mr. Henry.—We used dry lead for a while but went back to the paste.



TWIG BLIGHT OF APPLE.

Some Orchard Trouble.

MR. E. L. NIXON,

Pathologist, Department of Agricultural Extension, Penna. State College.

Under this title Mr. Nixon discussed fire-blight. He called attention to the fact that this disease is caused by a bacterium so small that it takes a very high magnification to reveal it to the eye. That the droplets of exudate, from cankered or infected areas, which are sometimes seen during the growing season, are masses of bacteria from which future infections of blossoms, twigs, and even the collar and roots of the trees occur. All of these forms of blight were illustrated by lantern slides and some by specimens.

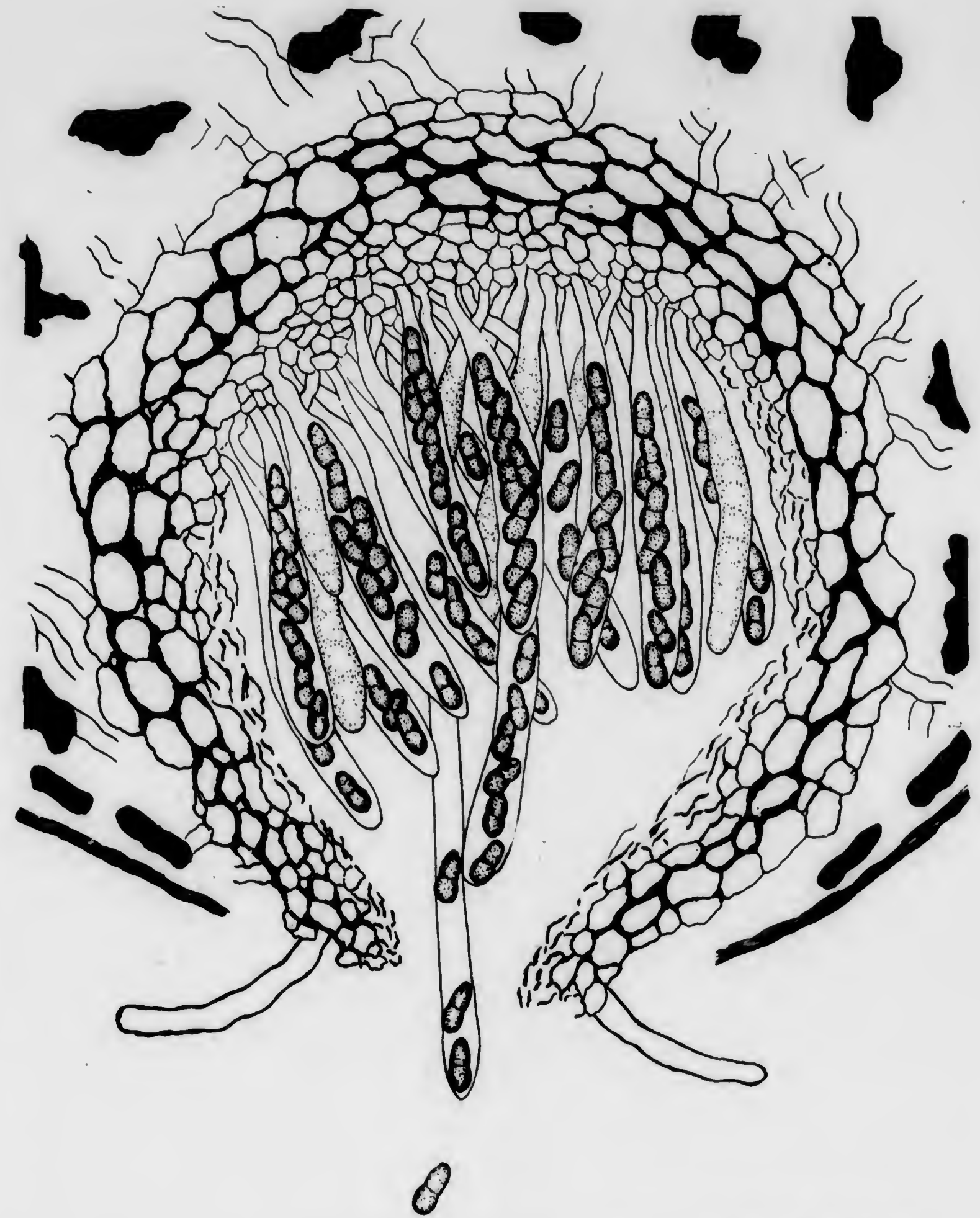


FIG. 3. OVER-WINTERING STAGE OF THE APPLE SCAB FUNGUS.

Drawing of a very thin razor section, much magnified, through a fruiting body of the fungus. This structure is just large enough to be seen with the naked eye. One of the contained sacs is in the act of expelling spores.



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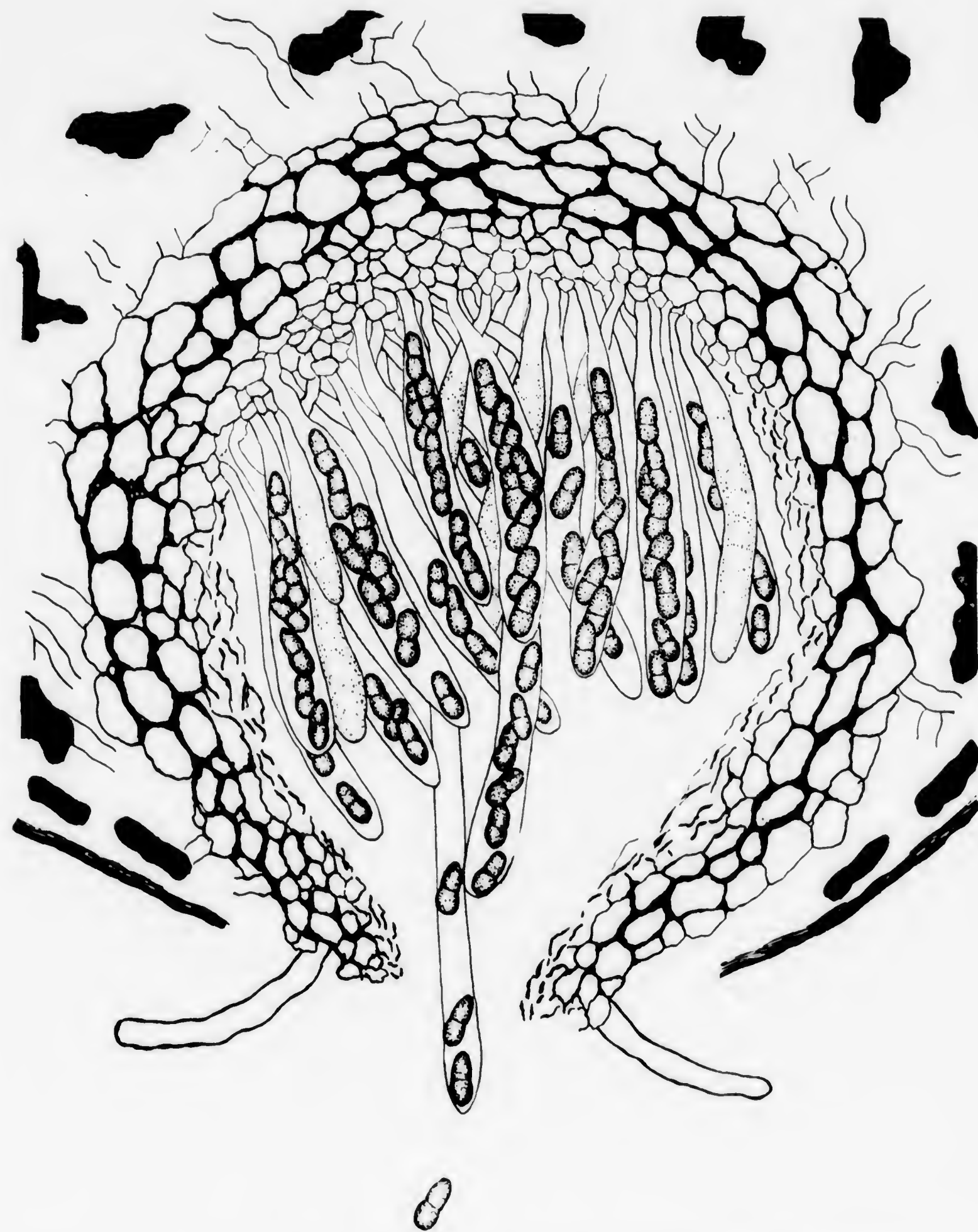


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The speaker showed artificial inoculation, from a canker taken into the greenhouse in February, into a young twig, pictures of which were taken every twenty-four hours from the time of inoculation until infection had ceased showing the rapidity with which the organism travels in young tissue and that it often passes beyond microscopic observation.

He then showed artificial inoculation from the same canker into a twig which was approaching dormancy and in which no infection occurred. From this and other experiments he drew the conclusion that pruning for blight both as to twig and canker infection should be done in the early fall and winter and but little if any in the early spring or while the tree is actively growing.

He then took up the form called collar blight and showed that in the removal of borers especially in the spring of the year you endanger greatly this form of infection by making wounds through which the organism may enter at a time when it is most abundant in the tree.

Attention was also called by living specimen to a form of root blight in which the whole stock on which the bud or graft was placed had blighted and died—the scion part still living and uninfected. This form of blight is found on trees varying in age from three to twenty years. It was pointed that this form was perhaps the most serious of any and that special attention should be paid to the stock or root system on which our trees are to be grown.

Member.—How would you account for the dark colored wood at the heart (referring to the specimen in hand)?

Prof. Nixon.—That is simply heart wood, a discoloring which comes on any or most trees when they reach a certain age.

Member.—In 1912 we had a very serious winter here and the orchard trees that were planted a year or two before were frozen and I can show you to-day brown wood resulting from the freezing of that winter. They healed over nicely and bore fine crops of fruit but I can always see that wood that was frozen.

Prof. Nixon.—To be sure trees will freeze and there is such a thing as winter injury but darkened heart wood is a normal condition.

Member.—Do I understand that you advise keeping out of the orchard when it is blighted and not do any summer pruning?

Prof. Nixon.—When orchards are blighted I strongly recommend pruning when trees are dormant.

Member.—If you cut out water sprouts those wounds would be comparatively fresh in the beginning of the bearing season; would they be liable to infection?

Prof. Nixon.—No they would not, if cut in the fall or early winter.



FIG. 2. EFFECTS OF APPLE SCAB.

The apple is half-grown and is enlarged to show how the cuticle of the fruit is lifted. The black area beneath is the scab fungus. Figure 4 represents a thin razor section through the margin of one of these spots.



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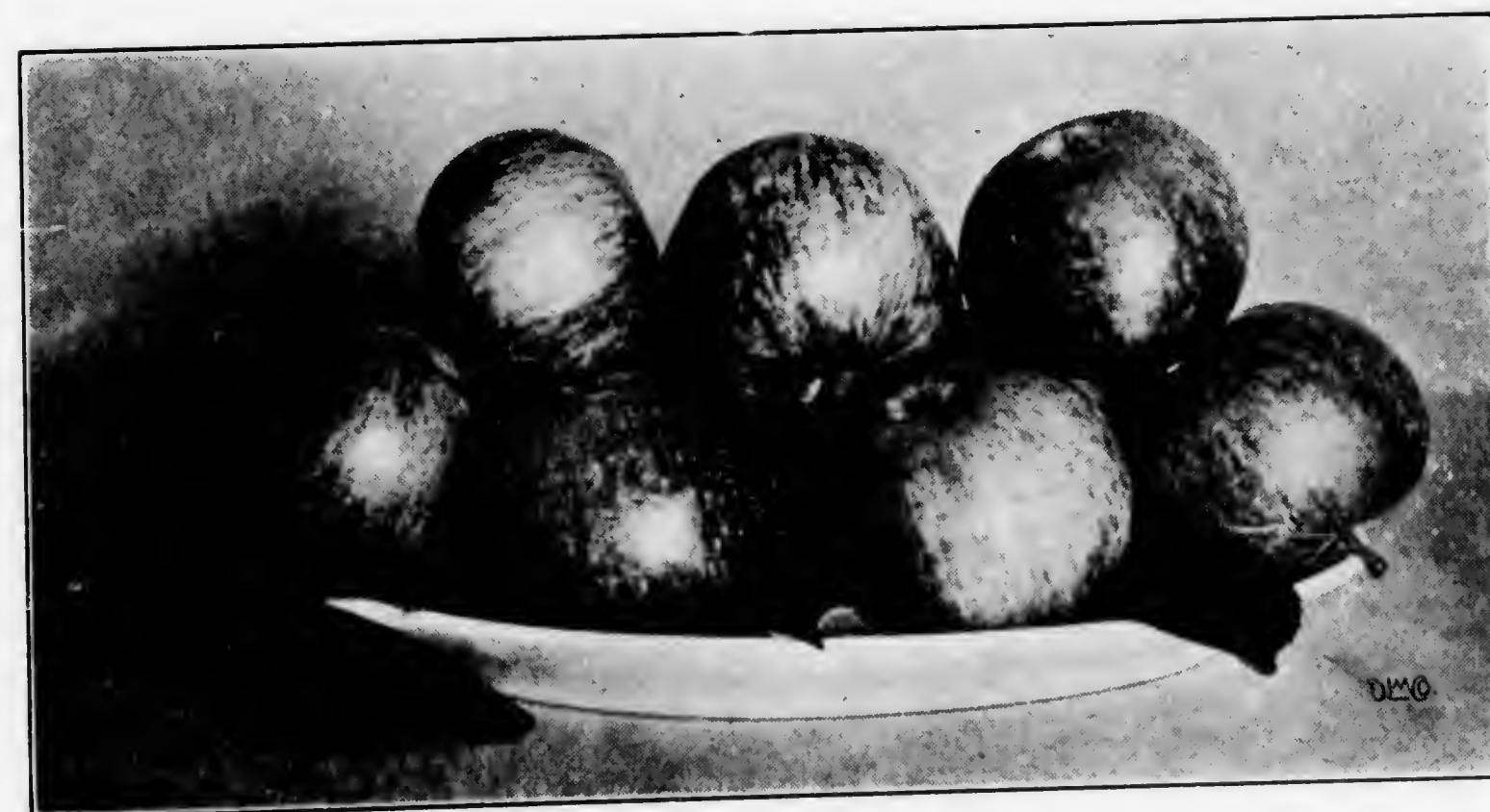
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NO SCAB ON THESE.

In Belgium and Poland Germany has deliberately stripped the country of all means whereby the inhabitants could earn a living. She tried to force those peoples, by the threat of starvation, to come to Germany and work in her munition plants. When they preferred starvation rather than to help Germany against their own nation, Germany deported scores of thousands of them by military force and hopes to replace them with German colonists in order that those countries may become provinces of the German Empire. The full tale of German barbarities in the lands which she has conquered cannot be told until after the war is over, but it makes us boil with anger to know that she has deported thousands of captured women into slavery, and that in the cellars of the houses of Eastern France, in the villages occupied by German troops, there are hundreds of helpless French women tethered and chained in the darkness, in order that they may be used to gratify the lust of German officers and men. German troops have burned French girls at the stake in order to lure the soldiers of France into death traps.

The contrast between German and American ideals of warfare could not be made clearer than by an illustration from our American Civil War. During that war Captain Symmes of the Confederate Cruiser Alabama, was seeking to sweep the commerce of the northern states from the seas. Almost all ports were closed to him by the blockade so that he could not take prizes, and he sank as many vessels as he could, but he never sank a ship without providing for the safety of every person on board. At one time he captured a vessel which he very much wanted to retain and to fit out as another cruiser like the Alabama. He put a prize crew on board and sent it to a port in one of the West Indies. When they drew near land they found that the island was suffering from an epidemic of cholera. The passengers on the captured ship were terrified lest they be put ashore on that island. When Captain Symmes learned of the cholera he immediately gave up all his hopes and purposes for the captured ship and set it free, with every person on board. Contrast this if you will with the method of the German captain of the submarine who sank the "Lusitania," drowning hundreds of men and women and children. Contrast it if you will with the conduct of the German submarine that sank the steamer "Belgian-Prince." The captain of this submarine not only sank the Belgian-Prince but destroyed the lifeboats of the sinking vessel with axes. When survivors climbed upon the hull of his submarine, he and his sailors took away their life-belts and even their clothes from them and then he and his sailors went into the submarine and closed their hatches and submerged, leaving the helpless victims to drown in the cold waters of mid-ocean. Contrast it if you will with the conduct of the German Government, which issued officially iron medals to celebrate the sinking of the Lusitania! An officer of the Red Cross who has just returned from France, showed me one of these medals the other day and I had never so vividly realized the horror of the business until

I saw that medal, bearing the official stamp and approval of the German Government upon that hellish act. Can you imagine Captain Symmes sailing into a confederate port with the news that he had sunk a vessel, as the Germans sank the Lusitania and the Belgian-Prince? Can you imagine Jefferson Davis and Robert E. Lee and the whole South would have repudiated him with indignation? I imagine how they would have exclaimed, "We can go down to an honorable defeat, but we will not win a victory by means like this!" When Admiral Dewey returned from the Philippine Islands can you imagine him meeting a Spanish passenger vessel and sinking it with all on board, "spurlos versenkt," without leaving a trace? If he had done such a thing there would have been no triumphal arches to greet him nor the thanks of congress, and we would have court-martialed him as a disgrace to the American flag, a disgrace to civilization, a disgrace to humanity.

We are fighting because no nation has a right to trample upon weaker peoples nor wantonly to attack its neighbor states. We are fighting to make the world not only safe for democracy but safe for humanity. We are fighting in order that all nations may have the right to freedom. We are fighting to put down international lawlessness and to win international disarmament, arbitration and lasting peace.

The war situation at present is a serious one. Germany has conquered nearly the whole of Belgium, some of the best lands in France, has conquered Serbia, Roumania and Montenegro, has put Russia out of the war by her spies and gold and unscrupulous intrigue and is now making a drive upon Italy.

One of the biggest factors, and perhaps the deciding question in this war, is the question of food.

In times of peace Germany produces four-fifths of her own food supplies, while England produces only one-fifth, France one-half, Belgium one-tenth and Italy two-thirds of the amount necessary for their people. The seas are sown with German submarines and it is easier for Germany to starve our Allies and our own soldiers at the front, than it is for us to starve Germany. Germany may be hungry but she will not starve. Under normal conditions, before the war, our Allies were compelled to import an average of forty per cent. of their food supply. Since the war commenced their production of food has very greatly decreased. The farms of France are producing on the average barely half as much to-day as they were producing in the year 1913.

One reason for the decreased production since the beginning of the war has been the conditions of climate, for the year 1916 was one of the poorest years so far as weather was concerned, in the agricultural history of the world. Another reason is the withdrawal of experienced men from the farms in order that they might go into the trenches, leaving the cultivation of the soil to inexperienced women and children and feeble aged men. Another reason is the

lack of proper farm machinery. Before the war a great deal of farm machinery was imported from America. This machinery deteriorates, and since the war commenced we have not been able to afford space on our ships to send new machinery to replace it. Those who have come from France recently, tell of the heroic efforts of the French women to cultivate the fields, and describe them hitching themselves to the plows, working and toiling over the fields with old fashioned hoes, or even creeping on their knees painfully along, tending the newly planted crops. Previous to the war Europe imported a great deal of fertilizer, but since the war we have not been able to afford space on our ships to bring fertilizer across the seas. The scarcity of ships has made it impossible for Europe to secure food from the more distant markets, such as Australia and India, because we cannot afford boats for that long haul, three times as far as the distance from North America. There is an enormous supply of wheat in Australia and India, but because of the long haul, plus the terrible menace of the submarines, it is practically impossible to get those supplies to Europe. Even in the case of food shipped from the United States and Canada, from five to ten per cent. is sunk by submarines.

In her first attack upon France, Germany captured and carried off 2,500,000 French cattle, at the very time when the burden was thrown upon the unconquered portions of France of feeding millions of refugees from Belgium and the conquered portions of her own land.

Not only is there a shortage of food in Europe, but there is an increased demand for it. Clerks, lawyers and physicians, who are taken from their offices and put into the strenuous toil of the trenches, need more food than before. Women who are taken from lace making and home keeping, and put into the heavy labor of munition factories, require more food.

In the effort to meet this demand for food, all of the nations of Europe, as well as our own country, have been killing off their herds, that is, destroying their capital stock in cattle. This means a serious condition not only to-day but for several years after the war is over.

It is imperative that we send food to our Allies on the other side of the sea. The soldiers will not fight if their families at home are starving. The Russian Revolution was caused primarily by hunger rather than by political ideas. We must send food to Europe if our boys and our Allies are to win this war and because of the shortage of ships it is necessary to send that food in the most concentrated form possible. That means, wheat and meat and fats and sugar. By meat we refer to beef, mutton and pork, the kinds of meat which are most easily exported, and we do not refer to eggs, chickens, fish and game, which are not suitable for export. This food must be sent by the shortest possible route, and that means from the United States and Canada. These two countries of North America must



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send the wheat, meat, fats and sugar that are needed by our Allies on the other side of the sea.

We have an enormous corn crop in this country, the largest that we have ever had. Often the question is asked why we do not supply our Allies with corn, of which we have an abundant supply, instead of wheat, since we have only wheat enough for the average consumption of our own people in normal times. The answer to this question is that corn meal is not a stable meal; it will not stay good more than a few days and will not stand shipping across the sea. If we were to ship corn we should have to ship it in the grain and there are no mills on the other side suitable for grinding corn. Even if mills should be built for this purpose, there is the further difficulty that the women of Europe have neither the knowledge to make corn bread nor the equipment in their kitchens with which to cook it. The women of America, in colonial days, made all of their soap and wove the cloth for the garments of the men, but we have found in this country that it is more economical to have soap and cloth made in factories and sold over the counter in our stores. Even so the women of Europe long ago gave over the baking of bread to the bakers for economical reasons, and they have not the equipment in their kitchens to bake bread. Corn bread is delicious when served hot, but can you imagine any one wishing to go to the baker's and buy corn bread that is several hours old, or would you send to the French men who are fighting in the trenches, corn bread that is several days old? There is another reason which is psychological. It is impossible to make a radical change in the diet of people who are in great mental distress. You know that when there is a funeral in your home there are some members of your family who in their sorrow find themselves unable to eat even the food to which they are accustomed. Now consider this. Every home in France has one or more men from that home either at the front in the trenches, or else wounded or else dead. There is no exception to this. Some member of every family in France is either fighting at the front, or wounded or dead. There is even a more sad feature of the situation. During the five years before the war began twenty-three per cent. of all the men who came up for enrollment for military service in France, were rejected as unfit because of tuberculosis. Nine hundred thousand of these men were rejected in the five years before the war commenced. When the war came and the iron heel of the invader was upon French soil, these men were called to the colors, and without any exception they responded to the call. Do you know what trench warfare means to a man suffering from tuberculosis? It is murder. Many of these men were captured by the Germans. The food of a German prison camp is not sufficient to sustain life in a healthy man, let alone to support a man suffering from tuberculosis and needing the most nourishing food. In the early days of the war the French women put up packages of food to send through neutral agencies to their husbands or sons or sweethearts, who were in Ger-

man prison camps. In the first year of the war these were good sized packages. As the war went on, when the terrible grip of hunger took hold upon the land, these packages grew smaller and smaller. The women of France never complained; they never will complain; they send what they are able to send, that is all.

Another question that is sometimes asked is why, when the price of flour may be the same in New York as in London or Paris, the cost of the loaf may be higher in America than in Europe. Partly, this is due to price-fixing by the European Governments, but there is a business reason due to the different customs of our country. In Europe the people buy their bread at the baker's door and carry it home. The only cost is the cost of baking. In our country the baker sells the loaf to the grocer, who must charge against the price of the loaf the cost of handling it and also the cost of delivering it. There is the custom in many parts of America of returning stale bread and of course the baker must charge his loss from this item against the original cost of the bread.

In France the shortage of sugar is so great that no one is allowed to buy more than one pound per month per person and they cannot always secure even this amount. In our country the average consumption of sugar is between eighty-five and ninety pounds per year per person, while in France the utmost that the people are allowed to buy is twelve pounds per year per person.

Do you know that in Italy not a single private family, rich or poor, will have a single pound of coal this winter? To meet the war emergency in the manufacture of munitions, Italy needs at present one and one-half times her normal coal supply, but in fact she is getting only two-thirds of her normal coal supply and she is using it all for public enterprises, so that private families cannot have a single pound of coal this winter.

Over in Europe the people are hungry. If they lived across the street from you instead of across the ocean, you would realize the situation very much more than you do to-day and it would not be necessary to make so urgent an appeal. Those people are hungry. Nothing ever made me realize this so vividly as a story that was told to me a year ago by a prominent Hollander, who has been serving in the Holland Red Cross. He told me how he had watched a little girl in a bread line on the other side of the sea. Can you think of your own little girl standing in a bread line? He said that he watched this little girl for two and a half hours waiting her turn, and when it came her turn they put her on the scales, and weighed her, and then they told her that she had not lost weight enough to be given any food that day! The little girl cried bitterly and said she had waited so long—but they did not have the food to give.

Now this is a simple problem in mathematics. There is only a certain amount of wheat and meat and sugar and coal in the world. If the needs of Europe are to be met they must be met by the United States and Canada. If you eat wheat and meat and sugar as you

are accustomed to eating them, and if we waste coal as we have been accustomed to wasting it, then our Allies will have to go without. We can eat other things, corn and vegetables and fish and other kinds of food. The people of Europe, cannot eat those other things. They must go hungry unless we eat less wheat, meat and sugar in order very greatly to increase our export of those foods abroad. The magic formula which will solve this problem and win the war is as follows: 100,000,000 people times 365 days in the year saving one slice of bread each day, would make a pile of bread bigger than the capitol at Washington. One hundred million people times 365 days in the year saving one slice of meat apiece, would make a pile of meat big enough to feed an army. One hundred million people times 365 days in the year, eating one spoonful less of sugar or one lump less of sugar per day, would make all the difference between privation and comfort to the suffering people on the other side of the sea. Those people are worthy of our help. They are fighting for freedom. The Germans say that the best fighters in the world are the French soldiers, and those who know attribute the splendid heroism of the French soldiers to the wonderful influence of the women of France. Those women who are toiling in the fields like beasts of burden, and depriving themselves of food that their men may have enough to strengthen them for the fight, are described as going with their boys to the train and seeing them off to the front without a tear. The women of France breathe their heroic spirit into the men of France. Those people are fighting for liberty, even as their great grandfathers came to America to help us in our fight for independence. An old French soldier did a particularly daring and reckless deed in the no-man's land between the trenches, and his general asked him why he did it. The general said, "You should have thought of your wife and children and left that difficult task for a younger man." The old soldier answered, "It was for my wife and children that I did it, in order that France might be free."

What is your share in the war? Some of us cannot go to the front and take our part in the fight in the trenches. Some of us cannot dig down into our pockets and buy liberty bonds; but there is one thing which we can all do as our share in winning the war. We can all help in the saving of food for the suffering people beyond the seas. We are not asked to go hungry. We are asked to substitute corn or vegetables or fish instead of the wheat and meat to which we are accustomed. If this involves sacrifice, that sacrifice is your share in this war which is to make the world safe for humanity.

The Food Administration is asking that you have one day each week on which you will not serve any bread or cereal that is made entirely of wheat. We are asking that you have another day each week on which you do not serve any beef, mutton or pork. We are asking you to be as sparing as possible in the use of sugar and coal.

Home Card

UNITED STATES FOOD ADMINISTRATION WHAT YOU CAN DO TO HELP WIN THIS WAR.

See other side showing why you should do it.

Our problem is to feed our Allies this winter by sending them as much food as we can of the most concentrated nutritive value in the least shipping space. These foods are wheat, beef, pork, dairy products, and sugar.

Our solution is to eat less of these and more of other foods of which we have an abundance, and to waste less of all foods.

Bread and cereals.—Have at least one wheatless meal a day. Use corn, oat, rye, barley, or mixed cereal rolls, muffins, and breads in place of white bread certainly for one meal and, if possible, for two. Eat less cake and pastry.

As to the white bread, if you buy from a baker, order it a day in advance; then he will not bake beyond his needs. Cut the loaf on the table and only as required. Use stale bread for toast and cooking.

Meat.—Use more poultry, rabbits, and especially fish and sea food in place of beef, mutton, and pork. Do not use either beef, mutton, or pork more than once daily, and then serve smaller portions. Use all left-over meat cold or in made dishes. Use soup more freely. Use beans; they have nearly the same food value as meat.

Milk.—Use all of the milk, waste no part of it. The children must have whole milk; therefore, use less cream. There is a great waste of food by not using all skim and sour milk. Sour milk can be used in cooking and to make cottage cheese. Use buttermilk and cheese freely.

Fats (butter, lard, etc.)—Dairy butter has food values vital to children. Therefore, use it on the table as usual, especially for children. Use as little as possible in cooking. Reduce the use of fried foods to reduce the consumption of lard and other fats. Use vegetable oils, as olive and cottonseed oil. Save daily one-third of an ounce of animal fat. Waste no soap; it contains fat and the glycerine necessary for explosives. You can make scrubbing soap at home, and, in some localities, you can sell your saved fats to the soap maker, who will thus secure our needed glycerine.

Sugar.—Use less candy and sweet drinks. Use less sugar in tea and coffee. Use honey, maple sirup, and dark sirups for hot cakes and waffles without butter or sugar. Do not frost or ice cakes. Do not stint the use of sugar in putting up fruits and jams. They may be used in place of butter.

Vegetables and fruits.—We have a superabundance of vegetables. Double the use of vegetables. They take the place of part of the wheat and meat, and, at the same time, are healthy. Use potatoes abundantly. Store potatoes and roots properly and they will keep. Use fruits generously.

Fuel.—Coal comes from a distance, and our railway facilities are needed for war purposes. Burn fewer fires. If you can get wood, use it.

GENERAL SUGGESTION.

Buy less; cook no more than necessary; serve smaller portions. Use local and reasonable supplies. Patronize your local producers and lessen the need of transportation. Preach and practice the "gospel of the clean plate." We do not ask the American people to starve themselves. Eat plenty, but wisely, and without waste.



Do not limit the plain food of growing children. Do not eat between meals. Watch out for the waste in the community. You can yourself devise other methods of saving to the ends we wish to accomplish. Under various circumstances and with varying conditions you can vary the methods of economizing.

If you use these things, the people on the other side of the ocean must suffer.

This idea of the Food Administration has been called "an adventure in democracy." The Kaiser by the iron hand of despotism can compel the people of his Empire to eat according to his bidding. In our country we are appealing to the patriotism of the people to do this voluntary sacrificial service. Have we public spirit enough to make this possible? Are we worthy of democracy? If we are not able to do voluntarily, out of love for our country and love for humanity what the Kaiser's subjects are compelled to do by law, then the Kaiser's government is the better government and will survive while ours must perish.

Often we are asked what is the use of saving when there are others who refuse to save. Regardless of what others may do, this duty is a personal one with you. There is only so much wheat, meat and sugar in the world. If you eat it, there are people across the sea who will be hungry. This is a larger question than even the question of patriotism. It is a question of humanity, a duty to your fellowman and to God. The wastefulness and folly of some gilded fool will not save you before the bar of God and of your own conscience if you ignore the appeal on behalf of hungry men and women and children across the sea.

Discussion.

Member.—I wonder why the men talking along that line fail to bring in the suggestion of the men having smokeless days.

Mr. Culbertson.—That is a thing some may wish to advocate, but let me call attention to one phase of that question, which of course is exactly the same case as the beer question and a lot of other questions, and I believe we ought to get this phase of the question very clearly in mind. Civilization is in danger. It is like a house on fire. If your house is on fire you are going to have that fire taken care of first, and if there is any dispute among the firemen, in the course of which dispute some of them might become less active, you will say, I will not cultivate any difference of opinion among the firemen until we first put the fire out. On the other hand, every bit of conservation along every line we can make in the interest of efficiency is going to help us win this war if it extends over a period of years, as seems probable at this time. We cannot afford, however, to have too much difference of opinion between people of our nation on this question of putting out the fire. There is such an overwhelming opinion in our country in favor of the prohibition question that I believe personally the prohibition proposition is going to be put through, and I shall be delighted to see it done, but my personal conviction is that we must be exceedingly careful about raising too many new questions now that would tend to divide our people at a time when it is necessary above all to get the most loyal support of our whole nation for this war.

Do not make the mistake of saying you will not help until the government does just as you want along some particular line. Do you know that a lot of the most careful thinkers in our country are very seriously afraid that if prices go up we shall have what always happens when prices go up—what happened in Russia, revolution? This is a point Mr. Hoover makes. When the prices go up in a country, the rich can buy and the poor cannot. Then comes a demand for better wages, better salaries, and that means industrial unrest and industrial upheaval. In Russia it was a hunger revolution. The prices went up and the people did not have money to buy food. We want to do everything we can here to supply food and keep prices down. I wish you would take that seriously to heart for it is one of the most serious menaces of the whole world. That is the thing which happened in Russia and it might happen throughout England, and even may happen to America. Every man who does his part in cultivating supplies is doing his part just as much as the man who is pouring his life-blood out in the trenches.

Member.—I would like to ask why, when wheat is quoted so nearly the price of corn, farmers are feeding wheat to their chickens?

Mr. Culbertson.—The price of wheat has been kept down by arrangements made whereby the Food Administrator is making purchases for the Allies and neutral countries. In the corn business the reason for high prices is that although the corn crop has been enormous, the biggest in history, the trade at large had not foreseen that and had not prepared for it, and distributing facilities were not sufficient to handle the enormous corn crop to the advantage of the public financially. We hope the conditions can be better soon, but that is the economic reason for the present price of corn.

Member.—I do not know that you have covered the question to my personal point of view. Would like a little more detail. I want to say that I have been feeding wheat to my chickens and have been supplying my trade with eggs, but have been endeavoring to get another food to keep up the egg production. Have looked up several formulas but very frequently there is something in the formula that I cannot get on my market and it doesn't help me out in my wheat feeding. Would be glad to hear what you say about that.

M. Culbertson.—I do not have the name of the person to refer you to, the specialist in relation to the poultry question. Of course, the thing to remember is we are not shipping poultry to the other side, but the desperate need is for wheat, and I know the Food Administration is trying to buy up all the wheat that can be bought to send to the other side of the sea, and if there is anything else we can feed in this country, even at a greater expense, that is part of the sacrifice we should make in the war. Wheat, meat, fat and sugar are the things they require over there and nothing can take the place of them, and any we use ourselves is just that much less that is to be sent to the people across the sea. The whole thing comes down to this. The best things we can send them to advantage is wheat, and if we use it

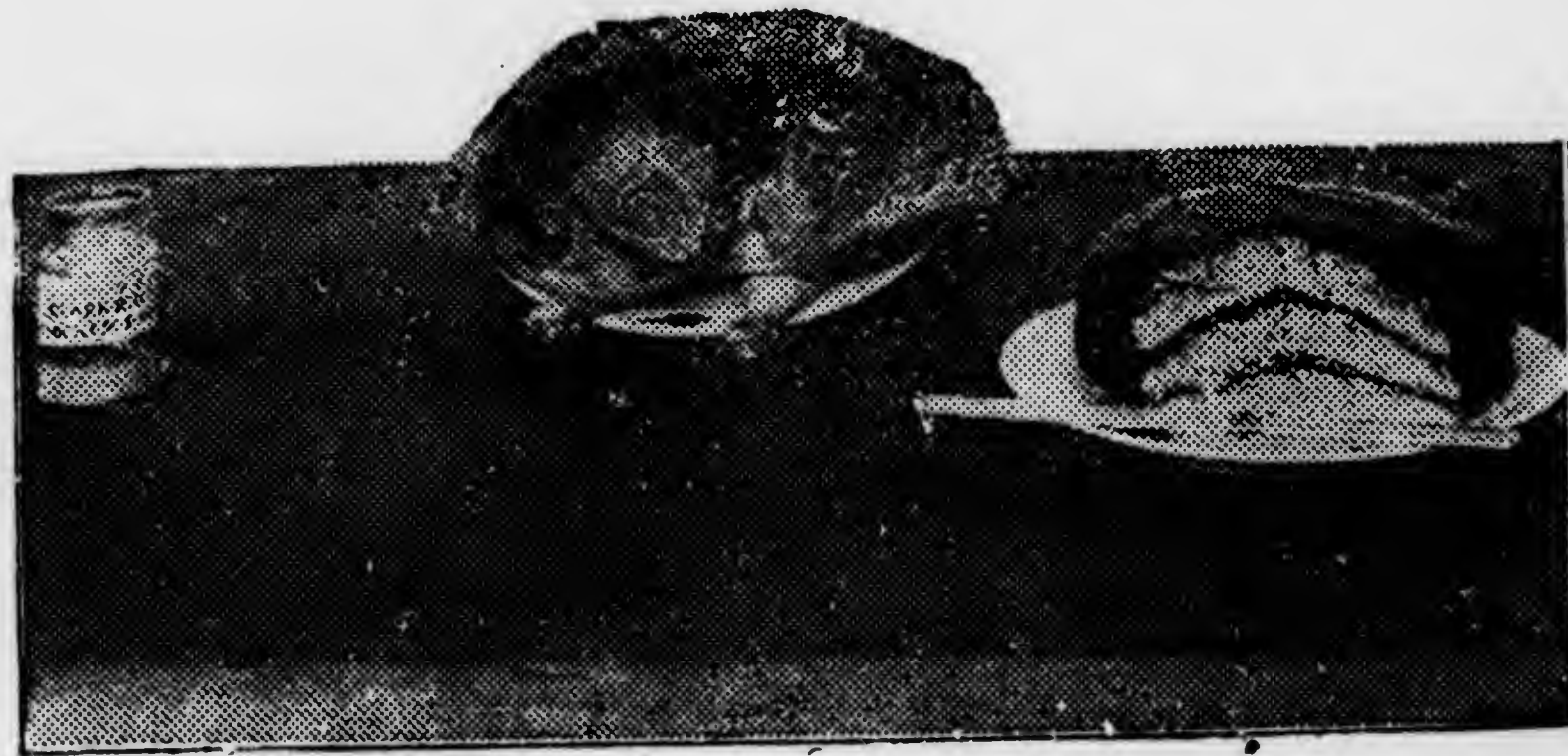
for other purposes it is not available. We can eat something else, but the people of France can't get anything else to eat.

It is not a case in which anyone is trying to lay down some iron-clad rules, and you must remember that this is a voluntary appeal to the American people individually to think out the problem of solving the question in the most effective way possible so as to send food to the other side. Do not believe anyone who says that the government is coming into your house to take the goods you have canned, or anything else. Remember this is an appeal to the people of a democracy.

The French are fighting for the right of their country to be free, to have their own flag, and not to have their individuality crushed out by the heel of Germany, and it is fitting that we make some individual sacrifice and show that we are worthy of this country that was founded by sacrifice, and this flag that has been made glorious by the blood of its defenders. The women of France go out into the fields and toil to raise food to keep their men at the front. One thing everyone of us can do in this fight for civilization of the world is to save wheat, meat, fat and sugar to be shipped to the hungry people across the sea and to the soldiers who are fighting for our flag.

CHICKEN FAT
is often wasted.

The French Housewife thinks it
is the finest shortening for cakes.



coal

To *the Miner* *dig it*

To *the Producer*
clean it - distribute it
equitably

To *the Railroads*
Speed it

To *the Consumer*
Save it

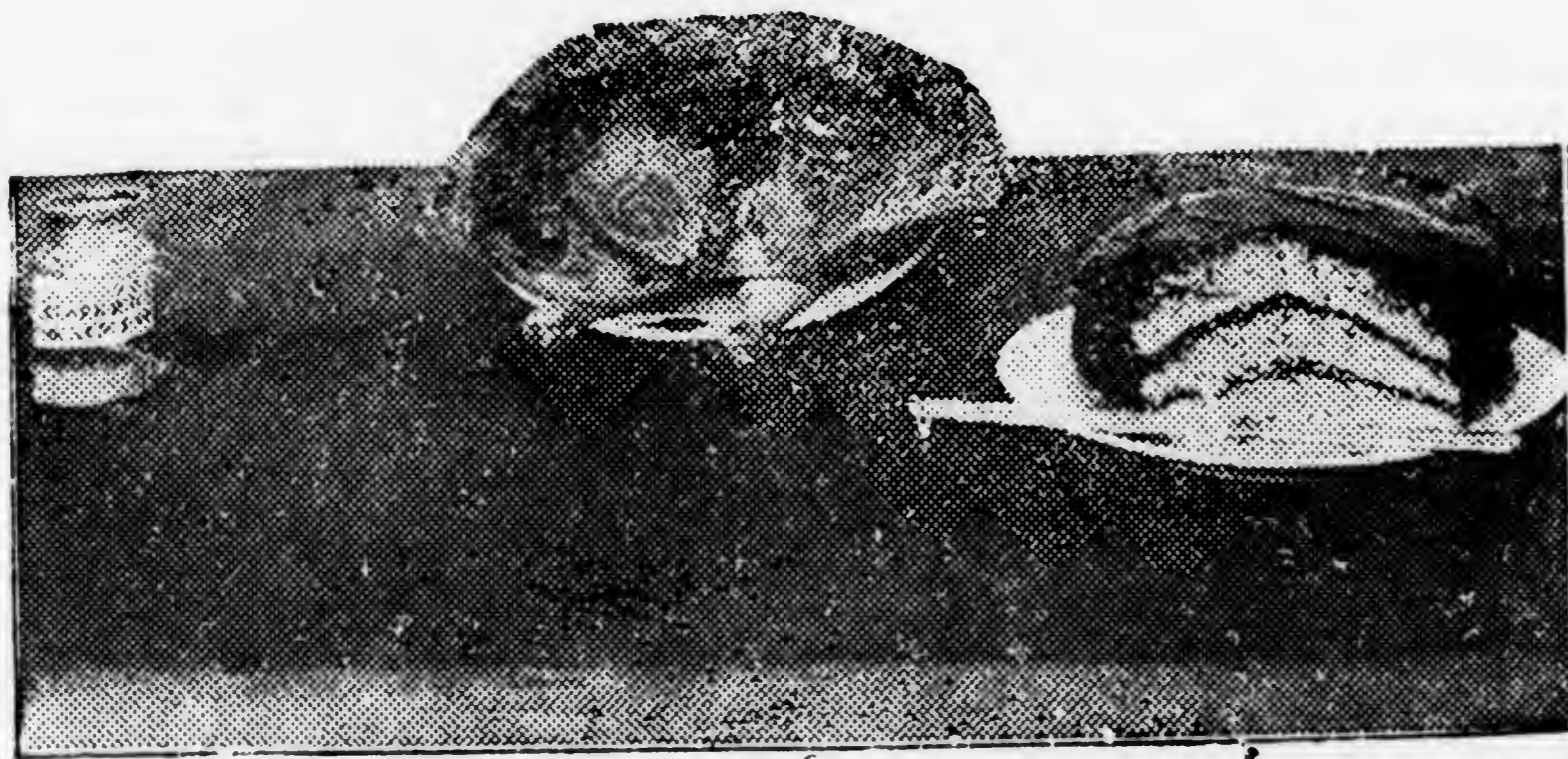
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U. S. Fuel Administration

Food

- 1-buy it with thought
- 2-cook it with care
- 3-serve just enough
- 4-save what will keep
- 5-eat what would spoil
- 6-home-grown is best

don't waste it

Best Methods of Selecting and Preparing Food from the View of Health and Conservation.

MISS KATE L. BEAR.

Home Emergency Demonstrator of Extension Department of State College, Pa.

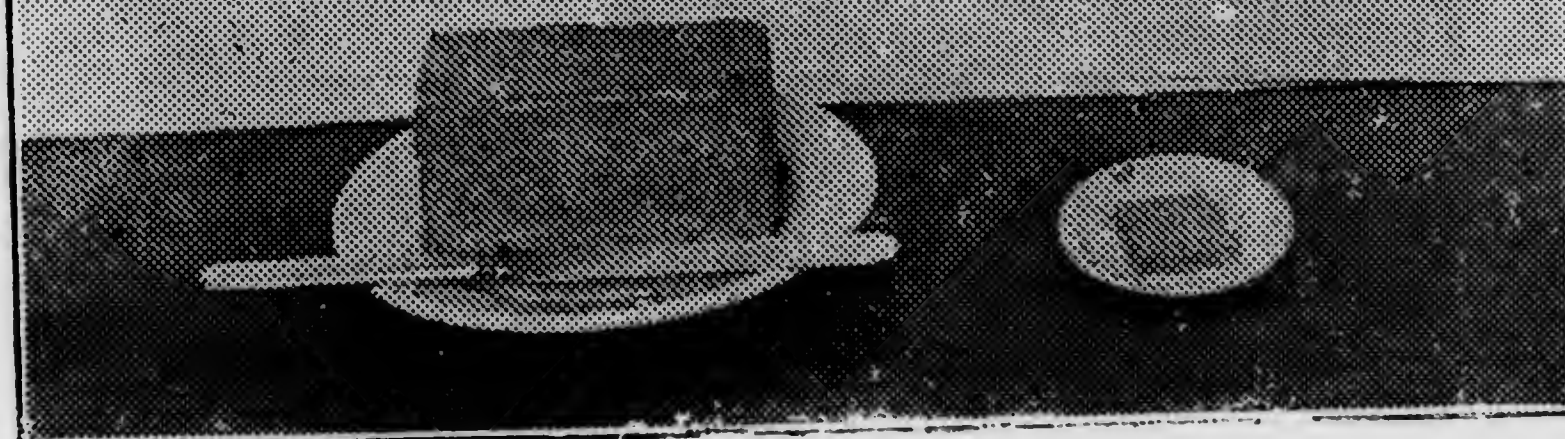
The three factors which will shape and determine the outcome of this world struggle are money, men and food. We are spending money in unlimited sums. We are dedicating to this battle for free government the lives of the flower of our young manhood. Money and men can be obtained through organization, and as a nation we have demonstrated our power to organize. But the task before the American nation is harder than that of organizing and equipping effective armies; it is to modify the food habits of the hundred million of our people so that the needed increase supplies of food may be furnished. Only through coöperation, in which as a nation we have had little experience, can this be accomplished.

Our Allies must have more food than they can raise and we must send them more than we can readily spare. To do this requires a few definite changes in our daily food habits, and they can easily be made. Neither producers nor dealers nor consumers can effect this alone. The women who administer our households cannot bring it about. It cannot be done by legislation. Only by coöperation, universal, wholesouled, decisive, can we do it. This coöperation must begin at home. Housewife, father and children are equally

SAVE BUTTER
by not serving too much to each person

SERVE INDIVIDUAL PORTIONS.
A pound makes 48 one-third ounce pieces.

Hotels have learned
that there is the least waste
from one-third ounce pieces.



**fats are fuel
for fighters**

**bake - boil - and broil
more — fry less**

United States Food Administration



concerned and equally under obligations to enter the partnership. The outcome of the war and the welfare of the nation depends upon their actively participating with others in this program.

This must be a universal service. Everyone must feel this as a personal matter. If each one makes himself individually responsible for doing the certain specific things the Government asks of him, the sum total of all the individual efforts in the United States will mean success.

If the cost of a meal is reduced two cents, that means a fund of two billions of dollars per year.

If each one of our 100,000,000 people uses one ounce less of sugar or fat, meat or wheat per day, that means that in one month 3,000,000,000 ounces, or 180,000,000 pounds are released, or 2,160,000,000 pounds per year.

If we use one pound of flour less per week we release 125,000,000 bushels of wheat per year. To be sure, families with a very limited income could not make even so small a contribution because they do not have enough to eat now, but relatively to our total population that number is small, and those who can afford it may make greater contributions. The South, which uses other grains than wheat for bread stuffs, furnishes an example for the whole nation. The North and West should decrease their use of wheat more nearly to the standard of the people of the South.

The destruction of food on the sea, the continual destruction of shipping, has limited the places from which food supplies may be obtained for any given country. As a result, North America is called upon, both by Allies and neutrals, to supply food far in excess of our normal exports. Because of shipping and other conditions, the program of shipment to the allies must be for concentrated foods; grain—especially wheat, beef, pork, mutton, dairy products and sugar.

It is perfectly clear that because of the great need for these foods for shipment abroad—a need which we must meet if we feed our own soldiers in the trenches and our Allies, and because of our inability to meet this demand if we continue to consume the amount we have been accustomed to in this country—the immediate problem before us is for every woman who has a home to learn what foods may be used in place of wheat, meat, dairy products and cane sugar, and to learn how and to what extent these foods may be used.

Of the seven grains commonly used, wheat is the one most needed for shipment. Corn will not answer, for abroad the mills are not adapted to grinding corn, nor bakeries to the making and distributing of bread-stuffs; nor are the people accustomed to its use. Corn-meal spoils in shipping. Oats, rye, barley, etc., do not make good bread-stuffs without the addition of wheat. Therefore wheat is the all-important grain for shipping. Our former exportation of 88,000,000 bushels will need to be increased to 220,000,000 bushels. To

meet this need we will have to use more of other grains and grain products than of wheat and wheat products.

Corn is the native American cereal upon which we can rely for bread. Alone or mixed with flour it can be used in very many ways as a food stuff. It is no new thing to us, and in depending upon it at this time we are only going back to earlier customs which have survived in the South more than in the North.

The experience of European nations shows that twenty-five per cent. of the wheat ordinarily used in breadmaking may be replaced by other cereals and still have a loaf that is light, palatable and wholesome—one that meets the body needs in supplying the proper and right nutritive materials.

Our average consumption of potatoes per capita is about nine ounces per day. If we could be induced to take an additional allowance of only four ounces of potatoes, our demand for bread would be reduced by about that amount per individual. Other heat producing foods, such as sweet potatoes, bananas, corn, peas and beans, may be used to reduce the demand upon cereals. On such a basis we may advocate decreased bread consumption.

In addition to replacing part of the flour ordinarily used in bread-stuffs with some other flour, meal or cereal, breakfast foods derived from wheat should be omitted and use instead, cream of rye, cream of barley, rolled oats and corn cereals.

Because the world's supply of meat is not sufficient to supply the needs of the United States and our Allies unless we practice economy, particularly in the use of those meats which are readily transported, as beef, mutton and pork, the suggestion is being made that we reduce our total consumption one ounce per day, and if possible, an additional ounce be replaced by the use of all kinds of fish; by the increased use of whole cream cheese, cottage cheese and local use of poultry and eggs where the prices are not prohibitive.

Dried peas, beans and nuts are also high in protein and may be made to substitute for meats as in nut and bean loaf.

In order that we may be able to send France the 100,000 tons of sugar asked for, we must use less sugar in our foods. If we reduce by one-third our purchase and use of candy and sugar for other purposes than for preserving fruits, we can save the French situation.

Corn syrup, molasses, honey and fruit syrups may be used in place of sugar. By cooking such fruits as dates or raisins with cereals we can avoid in part, if not altogether, the use of sugar, and this gives a pleasing variety to the breakfast food. By using less sugar on cereal and fresh fruit; by baking cakes with syrup, by using less icing and by eating less sugar-candy, we can easily diminish our consumption per capita the amount necessary to save the French situation. If we fail to do this the French will be without sugar for two months.

One of the crying needs of the Allies, and the enemy as well, is for fats. It has been estimated that on the average over three and one-

fourth ounces of fat purchased as such—that is, butter and other table fats, cooking fats and cooking and table oils—are included in the daily food provided for each person in the United States. This could be cut down to a little over two ounces without danger to health, provided the kinds of fat were carefully chosen and all the fat from meat trimmings and meat cookery were used to advantage. Certain fats, as those formed in milk and eggs, seem to contain certain substances that have a very marked effect upon growth. Conditions in the warring nations of Europe where the fat ration has been cut to the lowest limit, have shown that such a practice hinders the normal growth of children, the maintenance of health in adults and the repair of body tissue after wounds.

The recommendation of the Food Administration is that we eliminate the use of butter in cookery in order to make the supply go around so that we may have butter for table use. We must not only conserve fats, but we need to increase our fat supply. The hog produces more fat and more quickly and at less expense than any other animal. To overcome the shortage in fat as well as in meat and to use large corn crop the Food Administration asks that livestock production, especially hog raising, be increased. Of a normal crop seventy-five to eighty per cent. is fed. When the crop is greatly increased above normal, a still greater proportion must be fed in order to make the remainder marketable at a profit. If there should be a serious shortage of hogs in this country in 1918 there will be more corn on hand than the market can absorb. The increase in the 1917 corn crop over that of 1916 is nearly twenty-four per cent. For all these reasons an increased production of fifteen per cent. in pork is asked for 1918.

Not only is the food situation a serious one, but the clothing problem just now is needing our careful thought and attention. Even in normal times the wool produced is not sufficient for our needs, hence is adulterated with cotton, and cotton made to look like wool is sold as wool. Furthermore, old woolen cloth and yarn is torn and picked to pieces, carded, spun and remanufactured into a material known as shoddy.

The need for woolen garments in the army will draw heavily on our already insufficient supply of wool, and little, if any, of this wool will ever be recovered and remanufactured.

Cotton, too, is necessary in the use of firearms, and so is high priced. There is a lack of workmen in the factories. For these and other reasons it will be necessary for women in their homes to make more of the simple sewing, in order that garments may be made better, be of better material and last longer. Garments will need more care and attention to repair, to the end that time, energy, material and money may be saved for other things.



HOUSEWIVES! ATTENTION!

Any person who tells you the government is going to seize your normal winter supply of canned goods or other foods is a crook or a thief. Have him arrested. You will have the Food Administration's hearty approval if you will do so.



Home canning is not hoarding. No person can be convicted of hoarding without a public hearing. Anti-Americans are abroad in the land to convince you otherwise. Jail is their place. Put them there.



Food Administrator, Herbert Hoover, thought the putting down of these "crooks, thieves and confidence operators" important enough to issue a statement recently branding them "petty frauds who should be held for the police."



Discussion.

Member.—Can you tell us about the peanut oil advertised in *Good Housekeeping*?

Miss Bear.—I do not know about that particular brand. I know that peanut oil is very much used as a salad oil and is a very good substitute for other fats.

Member.—Will you please tell us how to deodorize Crisco as it is gotten from the store?

Miss Bear.—I have used it all through my work and have not noticed any odor to it. It is supposed that these vegetable oils are already deodorized. That is their special advantage. There is not supposed to be any flavor to a vegetable oil. I would not use it for cooking in the sense of flavoring dishes with it, but have used it for frying and in cake baking. There is nothing quite as good as butter, but there is no objectionable flavor to Crisco when you add salt so as to cover up the flat taste. There is not enough butter to go around and you need not use as much of these substituting fats as butter; not more than three-fourths as much. There is not much likelihood of being able to detect it. I have always thought that lard was more likely to be detected than anything else.

Member.—Will you tell us about the healthfulness of rye bread?

Miss Bear.—There is no objection to the use of rye bread as a healthful food, provided you have enough flour in it to make a light, porous, palatable loaf. If you make the heavy rye bread I think there is objection to it. Rye does not have the quality of protein that wheat has. There is not enough elasticity to make anything but a heavy loaf of bread, and whenever you substitute too large a quantity of rye you have a heavy loaf of bread. In Germany they mill it highly, which leaves a large percentage of the bran, and bran in rye flour is very irritating to the digestive tract. What I mean by milling rye ninety-five per cent. is that they leave ninety-five per cent. of the grain in the flour. Here we mill our flour about seventy-five to eighty per cent. which is a more refined product than if we left some of the bran in.

Member.—How do you substitute rolled oats in bread?

Miss Bear.—We substitute for only one-fourth of the ordinary flour. For a loaf of bread containing four cups of flour we would use one cup of rolled oats and three cups of flour, which makes the right proportion. Oats measure for measure would be lighter than wheat flour.

Member.—Do you use the rolled oats as it comes from the store?

Miss Bear.—The recipe calls for scalding the oats with one cup of liquid. Milk is preferred for two reasons; it gives a good flavor to the bread and a higher nutritive value than water. They may be used for the same reasons.

BOTH 'PHONES

H. G. BAUGHER

PROPRIETOR OF

The Adams County Nursery

ASPERS, PENNSYLVANIA

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Special Attention to Growing of

FRUIT TREES

(LEADING VARIETIES)

For Large and Small Planters



ALSO MANUFACTURER OF

Standard Apple Barrels

YOUR ORDERS SOLICITED

ADAMS COUNTY FRUIT RECORDS

Shipments Over Gettysburg & Harrisburg R. R.

Year	No. Bbls. shipped in bbls.	No. Bbls. shipped In bulk	Total No. Bbls.	No. Cars Apples (150 bbls. to car)	No. Cars Potatoes (500 bus. to car)	No. Cars Peaches (640 bask. to car)	No. Cars Pears (600 bus. to car)	No. Cars Canned Apples (36000 lbs.)	No. Cars Evaporated Apples (30000 lbs.)	No. Cars Cider Syrup	Other Shipments
Gettysburg, 1905	318	333	651	4	1						
1906	28		28								
1907	127		127	1							
1909	12		12								
1910	50		50								
1911	41		41								
1912	123		123								
1913	23		23								
1914	25		25								
1915	18		18								
1916	17		17								
1917	53	58	111								
Biglerville, 1903	8813	987	9800	65							
1905	7932		7932	53	2						
1906	2785	165	2950	20							
1907	17164	4216	21380	142	12						
1908	4956		4956	33	6						
1909	10785	137	10922	73	1						
1910	20017	1500	21517	144	10			43	5	4	1 car cherries.
1911	37897	552	38449	256				100	8	3	
1912	26521	779	27300	182	19			1	42	2	4
1913	32555	450	33005	220	4			2	95	2	6
1914	42172	3352	45524	303		31		64		9	
1915	38716	687	39403	263		20		55	2	10	
1916	66520	2368	68888	459	1	28		117	3 1/2	8	
1917	37876	400	35276	255		30		90	4	6	
Guernsey, 1903	2870	2413	5283	35							
1905	1771	1166	2937	20	11						
1906	1414	1329	2743	18	2						
1907	4798	2760	7558	52	15						
1908	2173		2173	15	7						
1909	7320		7320	49	5						
1910	11659	1267	12926	86	12	7					
1911	13600	363	13963	93			1/2				240 bks. plums, 650 bks. cherries.
1912	4713	574	5287	35	3	1/2	1/4				
1913	16213	194	16407	109	3	1/2	1/2				
1914	12512	3371	15883	106	2	5	1/2				5 cars cabbage.
1915	17837	761	18598	124	1/4	22	1				7827 bks. plums, 2924 bks. cher'es, 6 cars cabbage.
1916	22571	194	22765	152	1/4	13	1/2				14545 lbs. cherries, 2 cars cabbage.
1917	17584	1160	18744	125	1 1/2	12					891 crates cab'ge, 214 bks. plums, 311 crates cherries.
Bendersville, 1903	4163		4163	28							
1905	4000	2351	6351	42	16						
1906	1109	1561	2670	18	20						
1907	2824	6268	9092	61	22						
1908	2264		2264	15	21			2			
1909	3531	1200	4731	32	15						
1910	5628	2132	7760	52	30	4		1			
1911	8894	366	9260	62	7	1 1/2		3			
1912	4251	946	5197	35	30	4		1		3	
1913	12390	2175	14565	97	20			2		3	
1914	9095	2105	11200	75	12	9		2		3	
1915	15786		15786	105	8	12	1 1/2			7	
1916	16444	370	16764	112	14	7				12	
1917	13269	5165	18434	123	38	26	1			7	

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Deposits, Over \$1,100,000

Pays 3 1/2 per cent. on Special Deposits

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E. M. BENDER, Cashier

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Pays 3 1/2% on Time Deposits in six months or more

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Directors

S. G. BUCHER

W. E. WOLFF

G. F. SMITH

DAVID T. KOSER

JAMES C. COLE

ROBERT H. SHULL

ARTHUR ROBERTS

Adams County Fruit Records—Continued
Shipments Over Gettysburg & Harrisburg R. R.—Continued

Year	No. Bbls. shipped in bbls.	No. Bbls. shipped in bulk	Total No. Bbls.	No. Cars Apples (150 bbls. to car)	No. Cars Potatoes (500 bus. to car)	No. Cars Peaches (640 bask. to car)	No. Cars Pears (600 bus. to car)	No. Cars Canned Apples (36000 lbs.)	No. Cars Evaporated Apples (30000 lbs.)	No. Cars Cider Syrup	Other Shipments
Gardners, including Idaville after 1916,											
1903	997	985	1982	13	.....	.....	.....	.....	.....	.....	.....
1905	912	5215	6127	41	4	.....	.....	.....	.....	.....	.....
1906	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....
1907	6905	5440	12345	82	4	.....	1	.....	.....	.....	.....
1908	433	.....	433	3	1	.....	2	.....	.....	.....	.....
1909	2275	4571	6846	46	.....	.....	.....	.....	.....	.....	.....
1910	1566	3722	5288	35	1	4	2	.....	.....	.....	.....
1911	3900	4800	8700	58	.....	.....	5	.....	.....	.....	.....
1912	1860	.....	1860	12	6	.....	.....	28	.....	.....	.....
1913	4295	997	5292	35	1	12	2	62	.....	3	.....
1914	6036	1200	7236	48	.....	3	3	100	.....	5	.....
1915	450	.....	450	3	1/2	.....	.....	57	.....	.....	.....
1916	7075	300	7375	49	6	3 1/2	1 1/2	82	.....	8	.....
1917	2447	.....	2447	16	5	7 1/2	1 1/2	106	.....	8	1750 lbs. cabbage, 137 bu. berries, 335 bu. cherries, 54 bu. plums.
Starners, including Peach Glen after 1914,											
1905	682	1016	1698	11	5	.....	.....	.....	.....	.....	.....
1906	664	133	797	5	4	.....	.....	.....	.....	.....	.....
1907	1572	219	1791	12	3	.....	.....	.....	.....	.....	.....
1908	487	.....	487	3	3	.....	.....	.....	.....	.....	.....
1909	1825	8	1833	12	4	.....	.....	.....	.....	.....	.....
1910	2500	2192	4692	31	3	2	.....	.....	.....	.....	.....
1911	2018	668	2686	18	2	1/2	1/2	.....	.....	.....	.....
1912	2000	563	2563	17	18	1/2	1/2	.....	.....	.....	.....
1913	2290	150	2440	16	6	8	1	.....	.....	.....	.....
1914	3090	.....	3090	21	5	32	1/2	.....	.....	.....	.....
1915	4000	.....	4000	27	7	44	3/4	.....	.....	.....	.....
1916	4096	812	4908	32	1/2	22	5/8	.....	.....	.....	.....
1917	5872	400	6272	42	5	66	1	47	.....	2	.....
Hunters Run and Good-year,											
1903	625	.....	625	4	.....	.....	.....	.....	.....	.....	.....
1905	160	160	320	2	8	.....	.....	.....	.....	.....	.....
1906	295	262	557	4	5	.....	.....	.....	.....	.....	.....
1907	1417	514	1931	13	12	.....	.....	.....	.....	.....	.....
1908	1704	.....	1704	11	1	.....	1	.....	.....	.....	.....
1909	1289	510	1799	12	1	.....	.....	.....	.....	.....	.....
1910	2103	2190	4293	29	1	1	1	.....	.....	.....	.....
1911	3750	300	4050	27	.....	.....	.....	.....	.....	.....	.....
1912	2040	.....	2040	14	.....	.....	.....	.....	.....	.....	.....
1913	3045	.....	3045	20	1/2	.....	1	.....	.....	.....	.....
1914	2350	1146	3496	23	.....	50	1	.....	.....	.....	.....
1915	1549	.....	1549	10	1	40	.....	.....	.....	.....	.....
1916	3619	.....	3619	24	1/2	45	.....	.....	.....	.....	.....
1917	2744	.....	2744	18	6	36	.....	.....	.....	.....	24 bus. pears.
G. & H. R. R., total,											
1903	17468	4385	21853	146	.....	.....	.....	.....	.....	.....	.....
1905	15617	9908	25525	170	47	.....	.....	.....	.....	.....	.....
1906	6295	3450	9745	65	35	.....	2	.....	.....	.....	.....
1907	34797	19217	54014	360	56	.....	1	.....	.....	.....	.....
1908	12017	.....	12017	80	39	.....	4	.....	.....	.....	.....
1909	27037	6426	33463	223	26	.....	.....	.....	.....	.....	.....
1910	43523	13003	56526	377	57	17	3	43	5	4	1 car cherries.
1911	70100	7049	77149	514	9	2	9	100	8	3	240 bks. plums, 650 bks. cherries.
1912	41508	2862	44370	296	76	5	4	70	5	4	.....
1913	70748	3966	74714	497	34	20	9	157	5	9	.....
1914	75280	11174	86454	576	19	130	7	164	3	14	5 cars cabbage.
1915	78356	1448	79804	532	16 3/4	138	3 3/4	112	9	10	7827 bks. plums, 2924 bks. cherries, 6 cars cabbage.
1916	120342	3994	124336	828	22 1/2	118 1/2	2 1/2	199	15 1/2	16	14545 lbs. cherries, 2 cars cabbage, 24 bus. pears.
1917	79845	7183	87028	579	55 1/2	190 1/2	3 1/2	243	11	16	99760 lbs. cab'age, 268 bu. plums, 646 bu. cherries, 137 bu. berries.

Grow More APPLES POTATOES BEANS

Your Country Needs Them

Whether the war ends quickly or drags on indefinitely, the Government will continue to demand more and better food and will conduct an even more vigorous campaign for war gardens, for more economical and better truck, farm, and orchard methods.

Spray with Pyrox

and get more and better fruits and vegetables from every acre. Your family and the boys at the front need this food. Don't waste it on worms, bugs, and blight.

Labor will be scarce and high next year. Bowker's Pyrox is easily and quickly applied. It kills leaf-eating insects and fungous diseases in the same operation.

Bowker's Lime Sulphur

for all scale insects is made heavy and rich, and for that reason is more effective than solutions carrying less sulphur. We have the sulphur on hand now at the factory. That means prompt shipment.

The BOWKER Sprays can be relied on to do effective work

We ship from Baltimore.

BOWKER INSECTICIDE COMPANY
1011 Fidelity Bldg., Baltimore, Md.
TYSON BROTHERS INCORPORATED
General Agents Flora Dale, Pa.

Adams County Fruit Record—Continued
Shipments Over Western Maryland R. R.

Year	No. Bbls. shipped in bbls.	No. Bbls. shipped in bulk	Total No. Bbls.	No. Cars Apples (150 bbls. to car)	No. Cars Potatoes (500 bus. to car)	No. Cars Peaches (640 bask. to car)	No. Cars Pears (600 bus. to car)	No. Cars Canned Apples (36000 lbs.)	No. Cars Cider Syrup	Other Shipments
Virginia Mills, ....1907	320	8800	9120	61	.....	.....	.....	.....	.....	.....
1908	.....	1620	1620	11	1	.....	.....	.....	.....	.....
1909	326	1519	1845	12	.....	.....	.....	.....	.....	.....
1910	.....	30	30	.....	.....	.....	.....	.....	.....	.....
1911	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1912	300	.....	300	2	4	.....	.....	.....	.....	.....
1913	60	.....	60	.....	.....	.....	.....	.....	.....	.....
1914	.....	333	333	2	.....	.....	.....	.....	.....	.....
1915	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1916	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1917	1000	.....	1000	6	.....	.....	.....	.....	.....	.....
Jack's Mountain, ..1913	352	.....	352	2	1	.....	.....	.....	.....	.....
1914	893	1653	2546	17	.....	.....	.....	.....	.....	.....
1915	1040	.....	1040	7	.....	.....	.....	.....	13 bus. pears.	.....
1916	1418	164	1582	10	75 bus.	.....	.....	.....	27 bus. pears.	.....
1917	444	.....	444	3	100 bus.	.....	.....	.....	15 bus. pears.	.....
Orrtanna, .....1903	3300	.....	3300	22	.....	.....	.....	.....	.....	.....
1905	1062	.....	1062	7	.....	.....	.....	.....	.....	.....
1906	3659	.....	3659	24	.....	.....	.....	.....	.....	.....
1907	3177	2342	5519	37	1	.....	.....	.....	.....	.....
1908	2636	1020	3706	25	.....	.....	.....	.....	.....	.....
1909	741	840	1581	10	.....	.....	.....	.....	.....	.....
1910	8216	4045	12261	82	1/2	.....	.....	.....	.....	.....
1911	7043	3846	10889	73	.....	1	.....	.....	.....	.....
1912	8412	2798	11210	78	1	3	.....	.....	.....	.....
1913	12897	154	13051	87	1/4	.....	1/8	32	2	.....
1914	7784	4256	12040	80	.....	1	.....	33	2	.....
1915	8857	.....	8857	59	.....	5	.....	56	2	.....
1916	18722	1273	19995	133	.....	2	.....	86	.....	50 bus. pears.
1917	13646	215	13861	92	1	4	.....	100	9	.....
McKnightstown, ....1903	3438	.....	3438	23	.....	.....	.....	.....	.....	.....
1905	7895	178	8073	54	1	.....	.....	.....	.....	.....
1906	2296	254	2550	17	1/4	.....	.....	.....	.....	.....
1907	3393	1155	4548	30	3	.....	.....	.....	.....	.....
1908	1785	251	2036	13	.....	.....	.....	.....	.....	.....
1909	7724	2030	9754	65	1/2	.....	.....	.....	.....	.....
1910	14275	1800	16075	107	2	.....	.....	.....	.....	.....
1911	26297	2231	28528	190	1/4	.....	1	.....	.....	.....
1912	4122	520	4642	31	2	.....	.....	.....	.....	40 bus. pears
1913	13000	.....	13000	87	.....	.....	.....	.....	.....	30 bus. peaches, 20 bus. pears.
1914	11200	800	12000	80	.....	1	.....	.....	.....	1820 bus. pears.
1915	12583	1404	13987	93	1/2	.....	.....	.....	.....	.....
1916	12153	.....	12153	81	.....	.....	.....	.....	.....	3 bus. pears.
1917	13500	600	14100	94	.....	.....	.....	.....	.....	.....
Fairfield .....1914	1317	1118	2435	16	.....	.....	.....	.....	.....	.....
1915	615	.....	615	4	.....	2	.....	.....	.....	15 bus. pears.
1916	2600	375	2975	20	.....	.....	.....	.....	.....	.....
1917	2550	.....	2550	17	.....	.....	.....	.....	.....	.....
Other W. M. R. Stations west of Gettysburg, .....1906	328	.....	328	2	2	.....	.....	.....	.....	.....
1907	745	618	1365	9	2	.....	.....	.....	.....	.....
1908	42	.....	42	.....	.....	.....	.....	.....	.....	.....
1909	50	.....	50	.....	.....	.....	.....	.....	.....	.....
1910	26	564	590	4	4	.....	.....	.....	.....	.....
1911	223	400	623	4	.....	.....	.....	.....	.....	.....
1912	48	.....	48	1/2	.....	.....	.....	.....	.....	50 bus. pears.
1913	56	.....	56	1/2	.....	.....	.....	.....	.....	.....
1914	133	.....	133	1	.....	.....	.....	.....	.....	.....
1915	159	.....	159	1	.....	1	.....	.....	.....	.....
1916	428	.....	428	3	94 bus.	1/2	.....	.....	.....	.....
1917	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

“SCALECIDE”

The Guaranteed Spray Material
Has Proven Itself to be

The Greatest Dormant Spray

☞ After fourteen years we are not only doing more business than ever before, but we are urging comparison with the best Lime-Sulfur or oils on the market to-day and will give you your money back if “SCALECIDE” does not prove better.

☞ If sprayed with “SCALECIDE” your orchard will be healthier with less expenditure of time and money.

☞ Ask Tyson Brothers, Inc., Flora Dale, our Pennsylvania State Distributors, for further information on the merits and new developments of “SCALECIDE.”

B. G. PRATT CO.

50 Church Street
New York, N. Y.

Adams County Fruit Record—Continued
Shipments Over Western Maryland R. R.—Continued

Year	No. Bbls. shipped in bbls.	No. Bbls. shipped In bulk	Total No. Bbls.	No. Cars Apples (150 bbls. to car)	No. Cars Potatoes (500 bus. to car)	No. Cars Peaches (640 bask. to car)	No. Cars Pears (600 bus. to car)	No. Cars Canned Apples (36000 lbs.)	No. Cars Cider Syrup	Other Shipments
Gettysburg, including Granite,										
1906	13		13							
1907	18		18							
1908	23		23							
1909	22		22							
1910	428		428	3						
1911	36		36	1/2						
1912	442		442	2						
1913	154		154	1						
1914	1160		1160	8						
1915	331	195	331	2						
1916	1816	132	2011	13						
1917	406		406	3	2					
New Oxford,		1033	1033	7						
1907		1033	1033	7						
1908										
1909		276	276	2						
1910		695	695	4 3/4						
1911	390		390	2 1/2						
1912	275	152	427	3						
1913	300		300	2						
1914										
1915	200		200	1						
1916	668		668	4						
1917	250	1200	1450	10						
East Berlin,										
1905	50		50							
1906	1140	1193	2333	15	1/2					
1907	49		49		1/2					
1908										
1909	10	205	215	2						
1910	1	1	2							
1911	18	160	178	1						
1912		80	80	1/2						
W. M. R. R., total,										
1903	6738		6738	45						
1905	10380	1320	11700	78						
1906	7447	1447	8894	59	3					
1907	7720	13948	21668	144	7					
1908	4536	2891	7427	49	1					
1909	8873	4870	13743	91	1/2					
1910	22946	7135	30081	201	2 1/2					
1911	33959	6637	40596	270	1 1/4	1	1			
1912	14091	3550	17641	117	3	3			90 bus. pears.	
1913	26819	154	26973	180	1 1/4	1/2	32	2	30 bus. peaches, 20 bus. pears.	
1914	22487	8160	30647	204		2	33	2	1820 bus. pears.	
1915	23785	1404	25189	167	1/2	8	56	2	28 bus. pears.	
1916	37805	2007	39812	265	169 bus. 2 1/2		86		80 bus. pears.	
1917	31796	2015	33811	225	3 1/2	4	100	9	15 bus. pears.	
Littlestown,										
1910	450		450	3	2					
1911	300		300	2						
1912										
Dillsburg,										
1910	300		300	2						
1911	300		300	2						
1912										
1913	150		150	1						
1914	500		500	3						
1915	450		450	3						
1916	492		492	3						
1917	580		580	4						

USE
Bushel Baskets



We give our attention exclusively to the manufacture of this type of package

BARDEN & ROBESON
PENN YAN, N. Y.

Distributors for Pennsylvania, Maryland and the Virginias

Tyson Brothers Incorporated

FLORA DALE, PA.

Adams County Fruit Record—Continued
Total Fruit Marketed in County

Year	No. Bbls. shipped in bbls.	No. Bbls. shipped In bulk	Total No. Bbls.	No. Cars Apples (150 bbls. to car)	No. Cars Potatoes (500 bus. to car)	No. Cars Peaches (640 bask. to car)	No. Cars Pears (600 bus. to car)	No. Cars Canned Apples (36000 lbs.)	No. Cars Evaporated Apples (30000 lbs.)	No. Cars Cider Syrup	Other Shipments
Total shipped, 1903	24206	4385	28591	191	...	...	...	...	...	...	.....
1905	25997	11228	37225	248	52	...	...	...	...	...	.....
1906	13742	4897	18639	124	38	...	2	...	...	...	.....
1907	42517	33165	75682	504	63	...	1	...	...	...	.....
1908	16553	2891	19444	129	40	...	4	...	...	...	.....
1909	35910	11296	47206	314	27	...	...	...	...	...	.....
1910	67219	20138	87557	583	61½	17	3	43	5	4	Car cherries.
1911	104659	13686	118345	789	10	3	10	100	8	3	.....
1912	55599	6412	62011	413	84	8	4	70	5	4	.....
1913	97567	4120	101687	677	35½	20	9½	189	5	11	.....
1914	98267	19334	117601	783	19	132	7	197	3	16	5 cars cabbage.
1915	102591	2852	105443	702	17¼	146	3¼	168	9	12	7827 bks. plums. 2924 bks. cher'es. 28 bus. pears. 6 cars cabbage.
1916	158639	6001	164640	1097	24	121	2½	285	15½	16	14545 lbs. cher ries, 2 cars cabbage, 104 bus. pears.
1917	112221	9198	121419	808	58½	194½	3½	343	11	25	99760 lbs. cab- bage, 268 bu. plums, 646 bu. cherries, 137 bu. berries, 15 bu. pears.
Evaporated, 1903	Equal to	6547	6547	44	.....	.....	.....	.....	.....	.....	.....
1905	"	10670	10670	71	.....	.....	.....	.....	.....	.....	.....
1907	"	8333	8333	56	.....	.....	.....	.....	.....	.....	.....
1908	"	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1909	"	4666	4666	31	.....	.....	.....	.....	.....	.....	.....
1910	"	8600	8600	57	.....	.....	.....	.....	.....	.....	.....
1911	"	21750	21750	145	.....	.....	.....	.....	.....	.....	.....
1912	"	5000	5000	33	.....	.....	.....	.....	.....	.....	.....
1913	"	8933	8933	60	.....	.....	.....	.....	.....	.....	.....
1914	"	9000	9000	60	.....	.....	.....	.....	.....	.....	.....
1915	"	18405	18405	122	.....	.....	.....	.....	.....	.....	.....
1916	"	15000	15000	100	.....	.....	.....	.....	.....	.....	.....
1917	"	16000	16000	106	.....	.....	.....	.....	.....	.....	.....
Canned, 1905	"	2400	2400	16	.....	.....	.....	.....	.....	.....	.....
1907	"	10000	10000	67	.....	.....	.....	.....	.....	.....	.....
1908	"	1673	1673	11	.....	.....	.....	.....	.....	.....	.....
1909	"	12398	12398	82	.....	.....	.....	.....	.....	.....	.....
1910	"	16700	16700	111	.....	.....	.....	.....	.....	.....	.....
1911	"	25000	25000	167	.....	.....	.....	.....	.....	.....	.....
1912	"	27108	27108	181	.....	.....	.....	.....	.....	.....	.....
1913	"	42855	42855	286	.....	.....	.....	.....	.....	.....	.....
1914	"	64300	64300	429	.....	.....	.....	.....	.....	.....	.....
1915	"	53088	53088	354	.....	.....	.....	.....	.....	.....	.....
1916	"	79000	79000	526	.....	.....	.....	.....	.....	.....	.....
1917	"	89666	89666	598	.....	.....	.....	.....	.....	.....	.....
Cider, 1907	"	9524	9524	63	.....	.....	.....	.....	.....	.....	.....
1908	"	6670	6670	44	.....	.....	.....	.....	.....	.....	.....
1909	"	5714	5714	38	.....	.....	.....	.....	.....	.....	.....
1910	"	11120	11120	74	.....	.....	.....	.....	.....	.....	.....
1911	"	12500	12500	83	.....	.....	.....	.....	.....	.....	.....
1912	"	8000	8000	53	.....	.....	.....	.....	.....	.....	.....
1913	"	9150	9150	61	.....	.....	.....	.....	.....	.....	.....
1914	"	5958	5958	40	.....	.....	.....	.....	.....	.....	.....
1915	"	17619	17619	117	.....	.....	.....	.....	.....	.....	.....
1916	"	13903	13903	93	.....	.....	.....	.....	.....	.....	.....
1917	"	14833	14833	99	.....	.....	.....	.....	.....	.....	.....
Total fruit, 1903	24206	10932	35138	234	.....	.....	.....	.....	.....	.....	.....
1905	25997	24298	50295	335	52	.....	.....	.....	.....	.....	.....
1906	13742	4897	18639	124	38	.....	2	.....	.....	.....	.....
1907	42517	61022	103539	690	63	.....	1	.....	.....	.....	.....
1908	16553	11234	27787	185	40	.....	4	.....	.....	.....	.....
1909	35910	34074	69984	465	27	.....	.....	.....	.....	.....	.....
1910	67219	56558	123777	825	61½	17	3	43	5	4	.....
1911	104659	72936	177595	1184	10	3	10	100	8	3	.....
1912	55599	46522	102121	680	84	8	4	70	5	4	.....
1913	97567	65056	162623	1084	35½	20	9½	189	5	11	.....
1914	98267	98592	196859	1309	19	132	7	197	3	16	5 cars cabbage.
1915	102591	91964	194555	1297	17¼	146	3¼	168	9	12	6 cars cabbage.
1916	158639	113904	272543	1817	24	121	2½	285	15½	16	2 cars cabbage.
1917	112221	129697	241918	1613	58½	194½	3½	343	11	25	3 cars cabbage.

REX SPRAYS

☞ The Rex Companies are not manufacturers of chemicals, but specialize, at nine different manufacturing plants, on spray materials.

☞ We have a national reputation for high quality Lime and Sulphur Solution, Arsenate of Lead Paste and Powder and Calcium Arsenate Powder. If you are searching for low prices you may never hear of us; if you are wanting superior quality, we are well known. We are introducing our REX Lime and Sulphur Solution through TYSON BROS., INC., FLORA DALE, PA., who hanker after good things.

☞ We are general agents and distributors for the Gifford Fruit Sizing Machine, the little Sizer that does big business. You should write us about it, addressing

The Rex Company

P. O. Box 712

ROCHESTER, N. Y.

Comparison of Percentages

Year	Per cent. barreled	Per cent. sold bulk	Per cent. evaporated	Per cent. canned	Per cent. cider	Per cent. total fruit compared to 1903
1903.	70	12	18	.....	.....	100
1905.	52	22	26	.....	.....	143
1907.	41	32	8	10	9	295
1909.	51	16	7	18	8	200
1910.	54	16	7	14	9	356
1911.	59	8	12	14	7	500
1912.	54	6	5	27	8	344
1913.	60	2½	5½	26½	5½	466
1914.	50	10	4½	32½	3	563
1915.	53	1½	9½	27	9	553
1916.	58	2	6	29	5	776
1917.	46½	3½	6½	37	6½	688



Built-in kitchen cabinet, utilizing wall space to advantage for storage of supplies. Bread box with board and knife above it

511

200 330

OFFICE OF SECRETARY



ORGANIZED 1903

No more sent.

Katheryn Stanford, Librarian
State College, Pa.

FLORA DALE PA. June 14th, 1919

Dear Miss Stanford:-

Answering yours of the 12th, beg to advise that because of war conditions and other reasons, there was no annual meeting of the Fruit Growers Association in 1918, therefore there were no Proceedings copied.

Very truly yours,

EOT/H

THE FRUIT GROWERS ASSOCIATION OF ADAMS COUNTY
By

Edward C. Tyson
Secretary

519

208.3300

**End of
Title**