

State of Connecticut
PUBLIC DOCUMENT No. 24

Forty-second Annual Report

OF

The Connecticut Agricultural
Experiment Station

Being the annual report for the year ended October 31

1918

and including Bulletins Nos. 207 to 214

PRINTED BY ORDER OF THE LEGISLATURE

NEW HAVEN
PUBLISHED BY THE STATE
1919

CONNECTICUT AGRICULTURAL EXPERIMENT STATION

OFFICERS AND STAFF

SEPTEMBER 30, 1918.

BOARD OF CONTROL.

His Excellency, Marcus H. Holcomb, *ex-officio*, *President*.

James H. Webb, *Vice President*.....Hamden
George A. Hopson, *Secretary*.....Wallingford
E. H. Jenkins, *Director and Treasurer*.....New Haven
Joseph W. Alsop.....Avon
Wilson H. Lee.....Orange
¹Frank H. Stadtmueller.....Elmwood
²Elijah Rogers.....Southington
³W. H. Hall.....South Willington

Administration. E. H. JENKINS, PH.D., *Director and Treasurer*.
MISS V. E. COLE, *Librarian and Stenographer*.
MISS L. M. BRAUTLECHT, *Bookkeeper and Stenographer*.
WILLIAM VEITCH, *In charge of Buildings and Grounds*.

Chemistry.
Analytical Laboratory. ⁴JOHN PHILLIPS STREET, M.S.
E. MONROE BAILEY, PH.D., *Chemist in charge*.
C. B. MORISON, B.S., C. E. SHEPARD, } *Assistants*
⁵H. D. EDMOND, B.S., M. D'ESOP, PH.B. }
⁶HUGO LANGE *Laboratory Helper*.
V. L. CHURCHILL, *Sampling Agent*.
⁷MISS ALTA H. MOSS, *Clerk*.

Protein Research. T. B. OSBORNE, PH.D., D.Sc., *Chemist in Charge*.
MISS E. L. FERRY, M.S., *Assistant*.

Botany. G. P. CLINTON, Sc.D., *Botanist*.
E. M. STODDARD, B.S., *Assistant Botanist*.
MISS F. A. MCCORMICK, PH.D., *Scientific Assistant*.
G. E. GRAHAM, *General Assistant*.
MRS. L. D. KELSEY, *Stenographer*.

Entomology. W. E. BRITTON, PH.D., *Entomologist; State Entomologist*.
B. H. WALDEN, B.Agr., *First Assistant*.
⁸Q. S. LOWRY, B.Sc., I. W. DAVIS, B.Sc., } *Assistants*.
M. P. ZAPPE, B.S.
⁹MISS G. A. FOOTE, B.A., *Stenographer*.
¹⁰MISS MARTHA DEBUSSY, *Stenographer*.

Forestry. WALTER O. FILLEY, *Forester, also State Forester*
and State Forest Fire Warden.
A. E. MOSS, M.F., *Assistant State and Station Forester*.
MISS E. L. AVERY, *Stenographer*.

Plant Breeding. DONALD F. JONES, S.D., *Plant Breeder*.
C. D. HUBBELL, *Assistant*.

Vegetable Growing. W. C. PELTON, B.S.

¹Died Jan. 10.

²Appointed Feb. 25.

³Appointed April 12.

⁴Absent on leave.

⁵Appointed Feb. 15.

In service of the United States.

⁶Died Sept. 28.

⁷Appointed Sept. 1.

⁸Resigned March 1.

⁹Resigned Aug. 10.

¹⁰Appointed Aug. 26.

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TABLE OF CONTENTS.

Officers and Staff.....	iii
Contents.....	iv
Errata.....	iv
Report of Board of Control.....	v
Report of Treasurer.....	xvii
The Effects of Inbreeding and Crossbreeding upon Development..	1
Insects Attacking the Potato Crop in Connecticut.....	101
Fertilizer Report, 1918.....	121
Report on Food Products and Drugs, 1918.....	173
Report of the State Entomologist, 1918.....	245
Report on Commercial Feeding Stuffs, 1918.....	353
Condensed Milk, Malted Milk, Milk Powder.....	397
Report of the Botanist, 1917, 1918.....	409
Index.....	461

ERRATA

10718. Sanderson's Plain Superphosphate was omitted on pp. 129 and 130 of the fertilizer report (B. 209). The analysis follows:

	Found %	Guaranteed %
Phosphoric acid, water-soluble...	10.20	
citrate-soluble..	5.44	
"available"	15.64	14.00
citrate-insoluble	1.09	
total.....	16.73	

P. 154, under Chittenden's brands:

10878. "Potato Special without Potash" is misbranded. It should read Complete Tobacco and Onion Grower without Potash.

Report of the Board of Control

OF

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION

To His Excellency, Marcus H. Holcomb, Governor of Connecticut:

As required by law, the Board of Control of The Connecticut Agricultural Experiment Station herewith respectfully presents its report for the year ending October 31, 1918.

The following minute, adopted by the Board, records the death, during the year, of one of its members:

Frank H. Stadtmueller, a member of this Board, died at his home on Vine Hill Farm, in West Hartford, Connecticut, January 10, 1918, after a brief illness.

Mr. Stadtmueller was born on the same farm in West Hartford where he spent his mature years.

Early in his life the family moved to New Haven, where his father was for many years clerk of the Sheffield Scientific School and curator of the collections of Professor George J. Brush, the distinguished mineralogist. Here Mr. Stadtmueller received his education, taking courses in the Sheffield Scientific School of Yale University, under Professors Johnson, Brewer, and Oscar Allen.

In 1885 Mr. Stadtmueller returned to the place of his birth and served as farm manager there until his death.

His varied public services can be indicated only imperfectly by the important offices which he filled.

He served his town at various times as one of the selectmen, member of the town school committee, justice of the peace and trial justice, and for fourteen years was the town health officer.

He was also a vestryman in St. James Episcopal Church.

He was for several years president of the Connecticut Dairy-men's Association, a member of the Hartford Chamber of Com-

merce, the United States Public Health Association, and of a number of State agricultural organizations.

Mr. Stadtmueller made himself expert in the use of the bacteriological and chemical methods necessary for control of the purity of milk and was the pioneer in the certified milk industry in this State. On the farm under his care he worked out and practiced the methods and technique required to produce milk of the highest degree of purity and taught others the methods and practice. Being an expert in this and other dairy matters, his services as a lecturer were in demand all over New England.

He served as one of three commissioners to codify laws in relation to taxation, and on a committee to investigate and report on laws regarding the taxation of forest land.

For the last six years Mr. Stadtmueller was the State Dairy and Food Commissioner, and brought to this office his intimate knowledge of all matters connected with the dairy interest, study and experience of matters related to the public health, and devotion to the duties of the office.

From 1907 until his death Mr. Stadtmueller was a member of the Board of Control of this Station. His farm experience and wide knowledge of agricultural matters, his appreciation of the value of scientific research and his earnestness in whatever work he undertook, especially fitted him for this place and made him most helpful in it.

A brief recital of the various offices held by Mr. Stadtmueller gives no adequate idea of the service which he rendered. His high sense of honor and of personal responsibility made each appointment to office not a sinecure or a personal tribute to him, but a call to serve others, which he fulfilled to the limit of his ability and often beyond the limits of his physical endurance.

The members of this Board desire to record their deep appreciation of Mr. Stadtmueller's earnest and valuable services to this Station, their tribute to the memory of an able, scrupulously honest, efficient and unselfish public servant, and their deep sense of personal loss in his death.

THE SPECIAL WAR WORK OF THE STATION

John P. Street, chief chemist, was given leave of absence, commissioned captain in the United States Army, and engaged, under the Surgeon-General, in the inspection and control of army rations and food wastes in the cantonments in this country. Promoted to major, he was sent abroad and is serving in France.

C. B. Morison, assistant chemist, was given leave of absence, commissioned lieutenant in the United States Army, and is doing work similar to Major Street's in the American cantonments.

I. W. Davis, in charge of gipsy moth work was given leave of absence and is a corporal in the United States Marine Corps.

Twelve men employed as laborers in the gipsy moth work have also entered the army or navy.

E. H. Jenkins, director, is the Federal Food Administrator for the New Haven District and is a member of the Food Committee of the State Council of Defense.

W. E. Britton, chief entomologist, is chairman of the Food Committee of the New Haven War Bureau.

W. O. Filley, forester, has served as recruiting officer for the Foresters' Regiment and is a member of the State Fuel Administration.

W. C. Pelton, vegetable expert, is one of the committee assisting in the supervision of gardens in New Haven.

In 1917 the seed corn was greatly damaged by an untimely freeze, and to protect farmers from planting worthless seed this year the Station tested over 1100 samples, chiefly drawn by the County Agents in all parts of the State, reporting each test to the Extension Department of the Agricultural College, to the County Agent and to the owner of the sample. Only one-third of the samples tested was satisfactory, but largely as a result of this work very little poor seed was planted and the corn crop in 1918 is very satisfactory.

Aside from the above direct war services, every member of the staff has devoted much time to special war work.

Of special importance is the work of Dr. Osborne, with the collaboration of Dr. L. B. Mendel, of the Sheffield Scientific School. In our opinion, the greatest service which the Station is rendering in the present emergency, both to agriculture (in the department of

cattle feeding) and to the world, and which will continue to be of special value until the production of human food everywhere has become nearly normal again, is that which Dr. Osborne has done at this Station for the last twenty-five years and more. It was supported for years wholly from State funds, but is now in part supported by the Adams Fund.

This work has established for the first time, with substantial accuracy, the ultimate and proximate composition of a large number of protein bodies, proving that while their ultimate composition is in many cases nearly alike they differ widely in the nature and relative amount of their complex constituent radicals.

There followed a very extensive study of the relative nutritive value of these individual proteins by newly devised methods which, for the first time, made such tests possible, and which incidentally showed the futility of many of the short-time feeding tests which often have been given a confidence which was misplaced.

This study of the nutritive value of different single proteins showed that "protein" was not assimilated as a unit, but rather that each form of protein was a complex of nutrients (amino-acid and bases) from which the required elements were selected by the body, which rejected the others.

The very different requirements for growth and for maintenance have been demonstrated.

By the methods referred to above it has been for the first time possible to determine the relative importance of each mineral element in nutrition.

The nature, the importance, and the relative amount of vitamins existing in various feeds of animal and vegetable origin are being studied.

The application of all this work to the vast problem of feeding our own people and our allies at this time is being made by Dr. L. B. Mendel, who has been collaborating with Dr. Osborne on the physiological side of this project and who is a representative of the United States Food Administration on the Inter-allied Scientific Food Commission, and a member also of the Advisory Committee on Alimentation and of the Advisory Committee of the Home Conservation Division of the United States Food Administration.

THE DEPARTMENTS OF STATION WORK

The work of the different departments, so far as it is ready for publication, will appear in bulletins. Only the briefest notice of it can be given here.

BOTANY

Dr. Clinton in Charge.

Aside from the regular work of experiments and observations on various crops, partly in co-operation with the United States Department of Agriculture, special study has been made of the prematuring and rust of potatoes and of alarming troubles which appeared in July and August, which were proved to be due, not to fungi or insects, but primarily to deficient water supply and also, in some cases, to defective fertilization, especially as regards potash.

While Mr. Stoddard has been chiefly engaged in the field work of scouting, control and eradication of the white-pine blister rust, Dr. Clinton and Dr. McCormick have studied the disease, especially with reference to the manner of infection of both the pine and the alternate hosts—the currant and the gooseberry. They have determined the way in which the pine is infected through the leaves and the formation therein of sclerotia. They have also artificially produced on *Ribes* leaves the second and even the third stage of the fungus.

In co-operation with the United States Department of Agriculture, an extensive Plant Disease Survey of the State has been made.

Messrs. Stoddard and Graham tested over 1100 samples of seed corn sampled by County Agents and others in all parts of the State, in order to insure sound corn for planting. Only one-third of the samples examined was found to germinate satisfactorily.

CHEMISTRY

Dr. Bailey in Charge.

The work of the year, largely under Statute requirements, has involved the examination of 1118 fodder materials, 487 fertilizers, over 2100 food and drug products, and 1419 pieces of Babcock glassware (of which 3.3 per cent. were condemned as inaccurate).

Expert testimony in court has been required in 15 cases.

Some time has been devoted to the study of analytical methods.

To assist the Dairy and Food Commissioner in carrying out the provisions of an Act of Legislature Concerning the Testing of Milk and Cream (Chap. 221, Public Acts of 1917), several examinations have been held in this laboratory in order to test the capacity of persons making milk tests.

An exhibit of cereal breakfast foods has been prepared for the Department of Home Economics of the State Council of Defense for use in connection with their educational exhibit at various fairs in the State.

Numerous investigations of foodstuffs suspected of containing poisonous or injurious substances and also of cadavers suspected of containing poison have been made, upon the request of the State and local Food Administrators, of the Department of Justice, of Public Health and Police authorities, and of private individuals.

Besides the preparation of the bulletins in this report which are credited to him and an article on Food Economy by Substitution, printed in the Monthly Bulletin of the Department of Health, New Haven, February, 1918, Dr. Bailey has also assisted the State Dairy and Food Commissioner and the Director of this Station in the preparation of a revision of the Rules and Regulations relating to the State Food and Drug Law. He is serving as an expert on diabetic foods for the American Medical Association, and as a Referee of the Association of Official Agricultural Chemists.

ENTOMOLOGY

Dr. Britton in Charge.

The inspections required examinations of 88 nurseries, 387 cases of imported stock, and 385 apiaries containing 2913 colonies. Of the latter, less than four per cent. were found infested with disease.

The work of controlling the gipsy and brown-tail moths has been actively prosecuted, in spite of the great difficulty in getting labor. Thirteen men have been employed, and the infestations have been reduced and many eliminated. Slight infestations have been found in seven towns where they had not been previously reported. The Federal Bureau of Entomology has helpfully cooperated in this work.

The mosquito elimination work has been in charge of Mr. Walden, the director's deputy. Little new ditching has been done on account of the labor conditions, but the ditching previously done has been kept in fairly good condition and some new tide-gates necessary for the work have been built, and residents in the shore districts testify to great relief from the mosquito plague during the summer.

Time has been found to study the life history and habits of a sawfly injuring the Austrian pine and a cockroach doing great damage in greenhouses. This work has been done by Mr. Zappe.

Studies have been continued on the insects attacking cucurbits and on the control of the potato aphid and other insects injuring potatoes, and on spraying orchards to control the red bug and aphids.

A survey by the Federal Bureau of Entomology to learn the distribution in Connecticut of the Oriental peach moth has been made, in which the Entomological Department has actively cooperated. Injuries attributed to this insect have been found in twelve of our shore towns, but the insect itself has been found in only one town.

Much emergency war work has been necessary. This consisted of examining gardens, identifying insects, advising control measures, and giving advice and addresses relating to war gardens. In some of this work Dr. Britton has co-operated with the State Council of Defense. He has collaborated with the council in preparing a bulletin on war gardens and in preparing the war garden exhibit at agricultural fairs. He has also been chairman of the Food Committee of the New Haven War Bureau.

FORESTRY

Mr. Filley in Charge.

Besides the raising of seedlings for use on the Station forest at Rainbow and in the State forests, there have been the clearing of fire-lines and cutting of weeviled tops on the younger pine plantations at Rainbow, and examinations of woodland in order to advise owners as to the handling of the growth.

The work in the five State forests has consisted of getting out chestnut ties and poles and mixed cordwood from the Portland Forest and the planting of 15,500 seedlings on the cut-over tracts;

in the Simsbury Forest 10,000 seedlings were set; but on the other forest areas no extensive work was done aside from the general care of the land.

Six hundred and twenty-six acres have been added to the State forests during the year.

As State Forest Fire Warden the forester has had rather more than usual to do. During the first six months of 1918 there were 889 fires, burning over 33,000 acres and doing damage to the amount of \$110,000. Up to September 30th, however, there had been no fall fires, so that the annual loss will not be greater than is usual.

The field work to detect and decrease the white-pine blister rust was in charge of the forester until July, when it was temporarily taken over by Mr. Stoddard. In Norfolk, the most seriously infected spot, the decrease in the number of infections is partly to be attributed to the work of eradication done there last year. In general throughout the State the number of infections of both pine and *Ribes* is less than was the case last year.

Since November 1917 Mr. Filley has served under the Fuel Administrator as chairman of the Committee on "Wood for Fuel", a work which has taken very considerable time.

PLANT BREEDING

Dr. Jones in Charge.

The investigations on the laws of inheritance in maize and tobacco are being continued, being supported by the Federal grant made exclusively for research work. Particular study has been devoted to the effects of long-continued inbreeding and of subsequent crossing upon the productiveness and other characters of maize. These results have been assembled in the form of a bulletin which is in the process of publication.

The new variety of tobacco produced by the crossing of standard varieties followed by many years of selecting for a uniform and constant type has been grown in two different parts of the State with promising results.

The co-operative corn variety tests carried on at the Storrs and the New Haven Stations have yielded information concerning desirable varieties of corn for Connecticut and sources of seed for next year's planting.

PROTEIN RESEARCH

Dr. Osborne in Charge.

During the past year this department has studied the relative nutritive value of the proteins of the more important food products in general use. It has also attempted to establish the distribution and relative proportion in these food products of those recently discovered, but indispensable, food factors, commonly known as vitamins. The results of these investigations, which have been published in scientific journals, are too technical to be further referred to here, but it is believed that they have contributed much of value in the present time of dietary restrictions imposed not only on man but on farm animals by scarcity of supplies and prevailing high prices.

MARKET GARDENING

Mr. Pelton in Charge.

Experimental work has covered certain variety and strain tests of tomatoes, beans, beets, lettuce, radishes, cabbage, witloof chicory, melons, and celery, the last named in co-operation with three other New England states. The sweet-corn cross of Stowell's Evergreen and Golden Bantam has been subjected to an ear-to-the-row test to separate the strains. Six varieties of beans and four of sweet potatoes were planted on sandy land in four localities to determine their usefulness on such soils. Brief studies have been made of the vitality of sweet corn seed when variously treated.

As secretary of the Connecticut Vegetable Growers' Association the market gardener has conducted its correspondence, assisted at the annual meeting in February, 1918, and arranged two field meetings during the summer and fall.

In his capacity of chairman of the Sub-committee on War Gardens, of the New Haven War Bureau, the market gardener has had general oversight of the activities of the committee and has largely outlined its policies.

THE FIELD MEETING

The annual field meeting was held at the Mount Carmel Farm on August 20th. About four hundred people were present and examined the work which was in progress there. After the lunch,

Hon. J. W. Alsop, chairman of the State Council of Defense, made the principal address, on "Connecticut Agriculture in Relation to the War".

To carry out the field work properly has been extremely difficult because of the absence of all good farm labor, but under Mr. Hubbell's management the experiment work has not suffered and our aim to raise more food than ever has been carried out.

CHANGES IN THE STATION STAFF

The absence of those engaged directly in the United States service has been already noted.

On September 28th Mr. Hugo Lange, an assistant in the chemical laboratory, died suddenly at his home. For thirty years he had been employed by the Station in work which required absolute honesty, accuracy and diligence. In none of these things did he ever fail.

Following the destruction in November of the chemical laboratory used by the Storrs Agricultural Experiment Station, the chemist, Mr. H. D. Edmond, came to New Haven, where he is employed by both Stations under an arrangement by which the chemical work of the Storrs Station will be done wholly at this Station for the present.

Mr. Waldo L. Adams, assistant chemist, resigned in November; Mr. Q. S. Lowry, assistant in entomology, in March, and Miss Grace A. Foote, stenographer, in August. All of them resigned to accept much more adequate salaries elsewhere.

PUBLICATIONS

In the interest of economy the Station has adopted the plan of printing its bulletins as a part of its report, so that all accounts of the Station work appear either in its annual reports or in the publications of various scientific journals.

The Station report contains eleven bulletins, aggregating 478 pages, with 37 full page plates, which, with the usual reports of treasurer and director, together with the index, makes a volume of 526 pages. One Bulletin of Immediate Information (No. 8) on the diseases of bees and their treatment has also been issued.

Following is a list of papers published by members of the Station staff in scientific and other journals within the last twelve months. These could not be printed by the Station within the limits imposed by law, and the larger part of their contents is of immediate value to investigators rather than to farmers.

From the Protein Research Laboratory.

In the Journal of Biological Chemistry:

- The Proteins of Cow's milk. Osborne and Wakeman. 1918, **XXXIII**, pp. 7-17.
- Some New Constituents of Milk (Third Paper). Osborne and Wakeman. 1918, **XXXIII**, pp. 243-251.
- The Growth of Chickens in Confinement. Osborne and Mendel. 1918, **XXXIII**, pp. 433-438.
- The Role of Some Inorganic Elements in Nutrition. Mendel and Osborne. 1918, **XXXIII**, p. iii.
- Nutritive Factors in Animal Tissues (II). Osborne and Mendel. 1918, **XXXIV**, pp. 17-27.
- The Inorganic Elements of Nutrition. Osborne and Mendel. 1918, **XXXIV**, pp. 131-139.
- Nutritive Factors in Plant Tissues (I). The Protein Factor in Seeds of Cereals. Osborne and Mendel. 1918, **XXXIV**, pp. 521-535.
- Milk as a Source of Water-Soluble Vitamins. Osborne and Mendel. 1918, **XXXIV**, pp. 537-551.
- The Choice Between Adequate and Inadequate Diets, as Made by Rats. Osborne and Mendel. 1918, **XXXV**, pp. 19-27.

In the Journal of Pharmacology:

- The Growth of Chickens under Laboratory Conditions. Mendel and Osborne. 1918, **XI**, p. 170.

In the American Journal of Physiology:

- Nutritive Factors in Some Animal Tissues. Mendel and Osborne. 1918, **XLV**, p. 539.

From the Plant Breeding Department, by Dr. Jones.

- Bearing of Heterosis on Double Fertilization. Botanical Gazette, April, 1918, **65**: 324-333.
- Segregation of Susceptibility to Parasitism in Maize. American Journal of Botany, June, 1918, **5**: 295-300.
- The Effects of Inbreeding and Crossbreeding (An Abstract). Proceedings of the National Academy of Sciences, August, 1918, **4**: 246-250.
- Review of Coulter and Coulter's "Plant Genetics". Science, N. S., October 4, 1918, **48**: 346-347.

Some further idea of the miscellaneous work of the Station may be gathered from the following statistics:

Number of letters written.....	9,109
Public addresses.....	49
Papers in scientific journals.....	15
Popular articles in other publications.....	21
Specimens of insects and fungi identified for inquirers.....	501
Specimens added to herbarium.....	2,457*
Samples of seed tested.....	1,228

In the summer of 1917 the Connecticut State Department of Health asked if this Station could furnish quarters for the Bureau of Health Laboratories. The Station Board of Control, recognizing the value of this central location and of the other facilities which the city and the grounds of this Station afforded, and believing that this was the most desirable place to locate all of the scientific work required by the State, put at the disposal of the Health Department the ground floor and basement of the frame laboratory building, which has been occupied for the Health Department's uses since September 1, 1917.

All of which is respectfully submitted.

GEORGE A. HOPSON,
Secretary.

New Haven, Connecticut, October 31, 1918.

REPORT OF THE TREASURER, 1918.

E. H. JENKINS, in account with the CONNECTICUT AGRICULTURAL EXPERIMENT STATION for the fiscal year ending September 30, 1918.

RECEIPTS

Balance on hand, October 1, 1917 (Analysis Fees)		\$454.11
State Appropriation, Agriculture.....	\$18,750.00	
State Appropriation, Food.....	2,500.00	
State Appropriation, Insect Pest.....	6,000.00	
United States Appropriation, Hatch.....	6,875.00	
United States Appropriation, Adams.....	6,875.00	
Analysis Fees.....	12,400.00	
Connecticut Agricultural College.....	1,000.00	
Miscellaneous receipts.....	436.95	
Lockwood Trust Income (including sale of wood and Mt. Carmel Farm produce, \$1,500.85) ..	15,000.85	
		<u>\$69,837.80</u>
		<u>\$70,291.91</u>

DISBURSEMENTS

E. H. Jenkins, director, salary.....	\$2,800.00
E. H. Jenkins, treasurer, ".....	400.00
V. E. Cole, salary.....	1,067.00
L. M. Brautlecht, ".....	657.00
J. P. Street, ".....	500.00
T. B. Osborne, ".....	2,400.00
E. M. Bailey, ".....	2,315.00
C. B. Morison, ".....	1,595.00
C. E. Shepard, ".....	1,309.15
W. E. Britton, ".....	2,600.00
G. P. Clinton, ".....	2,600.00
E. M. Stoddard, ".....	1,378.13
W. O. Filley, ".....	2,491.66
A. E. Moss, ".....	1,850.00
E. L. Ferry, ".....	1,320.00
D. F. Jones, ".....	1,700.00
W. L. Adams, ".....	216.66
Michael D'Esopo, ".....	950.00
Florence McCormick, ".....	641.67
W. C. Pelton, ".....	2,000.00

*Of these, 1,278 were given by Dr. Clinton from his private herbarium.

H. D. Edmond, salary.....	\$816.64
B. H. Walden, ".....	83.33
Hugo Lange, ".....	1,059.90
V. L. Churchill, ".....	1,045.00
William Veitch, ".....	770.00
Etta L. Avery, ".....	528.00
C. D. Hubbell, ".....	880.00
G. E. Graham, ".....	935.00
C. A. Gallastegui, ".....	150.00
Alta H. Moss, ".....	164.00
Mrs. L. D. Kelsey.....	468.00
Henry Kiley.....	902.00
Frank Sheldon.....	902.00
O. J. Welch.....	902.00
T. F. Barrows.....	476.57
Theodore Gonier.....	445.00
Labor.....	4,225.75
Publications.....	360.27
Postage.....	327.26
Stationery.....	394.89
Telephone and Telegraph.....	217.60
Freight and Express.....	189.20
Gas, Electricity and Kerosene.....	1,288.15
Coal.....	4,153.06
Water.....	155.85
Chemicals.....	799.60
Laboratory Supplies.....	346.33
Agricultural and Horticultural Supplies.....	105.31
Miscellaneous Supplies.....	747.83
Fertilizers.....	643.30
Feeding Stuffs.....	587.77
Library and Periodicals.....	239.34
Tools, Machinery and Appliances.....	324.82
Tools, Machinery and Appliances (Repairs)..	716.11
Furniture and Fixtures.....	395.88
Furniture and Fixtures (Repairs).....	62.01
Scientific Apparatus.....	301.52
Scientific Apparatus (Repairs).....	84.63
Travel by the Board.....	182.07
Travel by the Staff.....	628.45
Gasoline for Automobiles.....	434.97
Travel in connection with Adams Fund Investi- gations.....	74.00
Insurance.....	1,032.34
Insect Pest Appropriation to State Entomologist	6,000.00
Contingent.....	423.57
Buildings and Land (New Buildings).....	2,640.93

Buildings and Land (Betterments).....	\$199.54
Buildings and Land (Repairs).....	381.94
<hr/>	
Total Disbursements.....	\$69,983.00
Balance on hand, Sept. 30, 1918 (Analysis Fees)	308.91
<hr/>	
	\$70,291.91

NEW HAVEN, CONN., Oct. 18, 1918.

THIS IS TO CERTIFY that we have audited the accounts of Mr. E. H. Jenkins, Treasurer of the Connecticut Agricultural Experiment Station, for the fiscal year ending September 30, 1918, and have found them correct.

WILLIAM P. BAILEY,
JAMES P. TOBIN,

Auditors of Public Accounts.