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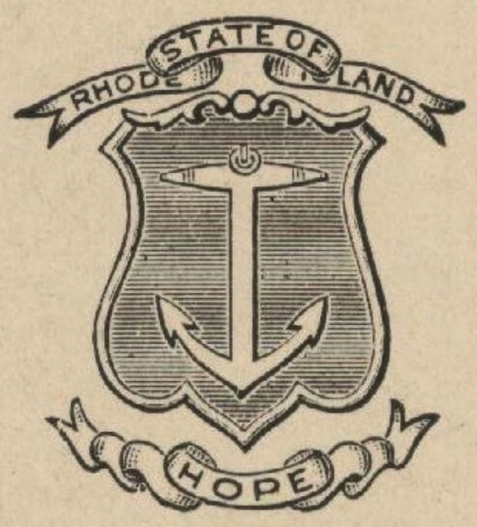
BULLETIN OF RHODE ISLAND STATE COLLEGE

VOL. XII. NO. 4. FOR FEBRUARY, 1917

REPORT OF THE BOARD OF MANAGERS



KINGSTON, R. I.

1917

PUBLISHED QUARTERLY BY THE COLLEGE
MAY, AUGUST, NOVEMBER, FEBRUARY

ENTERED AT KINGSTON, RHODE ISLAND, AS SECOND-CLASS MATTER

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1917

Rhode Island State College

Corporation.

HON. ZENAS W. BLISS ..... PROVIDENCE COUNTY
HON. ROBERT S. BURLINGAME ..... NEWPORT COUNTY
HON. CHARLES ESTES ..... BRISTOL COUNTY
HON. ROWLAND HAZARD ..... WASHINGTON COUNTY
HON. THOMAS G. MATHEWSON ..... KENT COUNTY
HON. WALTER E. RANGER .. COMMISSIONER OF PUBLIC SCHOOLS, *ex officio*
HON. PHILIP A. MONEY ..... MEMBER OF STATE BOARD OF AGRICULTURE

Officers of the Corporation.

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HON. ZENAS W. BLISS, Vice-President ..... PROVIDENCE
HON. ROBERT S. BURLINGAME, Clerk and Treasurer ..... NEWPORT

Board of Visitors for 1916-17.

MISS CAROLINE HAZARD ..... PEACE DALE
MRS. RICHARD JACKSON BARKER ..... TIVERTON
MR. RICHARD S. ALDRICH ..... WARWICK
MR. DUDLEY E. CAMPBELL ..... NEWPORT
MR. JOHN FLETCHER ..... PROVIDENCE
MR. FRANK L. PIERCE ..... PROVIDENCE
MR. GEORGE K. TINKHAM ..... WARREN

REPORT.

To His Excellency R. Livingston Beeckman, Governor, and the Honorable General Assembly of the State of Rhode Island and Providence Plantations, at its January session, 1917:

I have the honor to submit herewith the Twenty-Ninth Annual Report of the Board of Managers of Rhode Island State College, as required by law.

WALTER E. RANGER,
President, Board of Managers.

REPORT OF THE PRESIDENT OF THE COLLEGE

To the Honorable Board of Managers of Rhode Island State College:

GENTLEMEN:—I submit the following as my report for the calendar year 1916.

In General.

The year has in general been one of advance and enlargement in usefulness, and this in all the three phases of the work of the college. I am submitting herewith reports from the Director of the experiment station and the Director of the extension service, to which you are referred for specific information as to the work of these departments. The pages following relate specifically to the work of the instructional departments.

Service as Acting Director.

Early in the winter the health of the Director of extension service, Professor A. E. Stene, became greatly impaired and he found great difficulty in keeping up the work of his office. His condition did not improve and, on February 18, Professor Stene asked for and received a leave of absence. I undertook to take care of the work during his absence, being formally appointed Acting Director March 23. Professor Stene resumed his duties December 1, having fortunately made an entire recovery in the intervening seven or eight months. It is a source of much gratification to us that we have Professor Stene again at work among us.

During these months, however, there was much of a very important nature in connection with the establishment of the greatly developed extension service, that had to be attended to, and notwithstanding very efficient aid in routine matters from Mr. Ernest K. Thomas, State Leader of Club Work, whom I made my immediate representative and deputy in the office, the duties devolved upon me in addition to those of my own regular official position were very burdensome and sometimes quite trying. It was a period of foundational and constructional work. The extension work, the functions

of the farm bureau, the duties and activities of the county agent, were all entirely unfamiliar to the people and even to those in direct charge of the work in the field. There was uncertainty and misconception even among those most actively engaged in forwarding the movement, and in consequence there came friction and incipient antagonism.

Under these conditions it will readily be seen that there was much in the way of making decisions, correcting misapprehensions and composing discords that could not be transferred to anyone, and a great part of my time was taken up with these duties. Finally, we seem to have arrived at some degree of mutual understanding and a common basis of co-operation among all the forces concerned.

The first farm bureau district, that composed of Washington and Kent counties, was organized during the year 1915. The second, the Providence County Bureau, was put in operation April 1 of the year 1916 by the choice of Mr. David Elder, up to that time State Leader and Organizer.

College Attendance.

TABLE I.

Showing Attendance by Classes During the Years from 1906 to 1917, Inclusive.

	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917
Graduate Students...	...	4	3	5	6	3	3	4	4	1	4	6
Seniors	8	9	12	13	17	19	20	23	28	26	41	38
Juniors	9	11	14	20	20	20	27	35	28	46	37	51
Sophomores	15	16	26	32	24	37	46	44	61	62	79	94
Freshmen	17	26	36	38	59	63	58	72	87	118	122	122
Irregular	16	11	10	15	25	20	28	9	12	2	9	8
Total, college....	65	77	101	123	151	162	182	187	220	255	292	319
Preparatory	46	45	18	28	...	...	...	...	...	...	...	...
Two-year courses...	...	...	15	15	29	21	18	34	31	21	12	17
Totals	111	122	134	166	180	183	200	221	251	276	304	336
Poultry	20	20	19	19	20	28	28	22	18	9	7	...
Summer School.....	...	...	...	...	...	39	24	...	...	...	...	...
Final totals.....	131	142	153	185	200	250	252	243	269	285	311	336

This table serves to show among other things that in the years 1915, 1916, and 1917 the freshman class has remained in registration practically stationary, and this fact becomes all the more striking when we note that in the years preceding an *average* growth of twenty-four per cent. over the previous year in each case has been maintained.

In explanation of the phenomenon and once more to draw attention to the policy being pursued I quote the following from my report of one year ago:

"The one outstanding fact of the year 1915 has been that it has been necessary to limit the attendance. More than a year ago, it became apparent that unless some means of restricting the size of the incoming class in September, 1915, were adopted, we should not be able to care for the number that would be registered. The freshman class of 1913-14 numbered 87; that of 1914-15 numbered 118, an increase of thirty-six per cent. On the same basis of entrance the present freshman class would have numbered 160, and the total attendance would have been approximately 350 students. Now our accommodations, not merely as to dormitory space, but also and more significantly as to classroom and laboratory facilities and as to the size of the teaching force, do not permit of the successful and adequate training of more than 300 students. The number of houses in Kingston for rent is limited. We have secured all that are available and are using them to their full capacity. Our classrooms and laboratories are filled to the limit of capacity. The number of teachers reckoned in terms of full-time employment is 29 13-15, which means under present conditions, 10.4 students to each professor and instructor. This is regarded in American college work as certainly approaching the upper limit of efficiency. It seemed obvious, therefore, that some means must be adopted to exclude from the incoming freshman class in September some fifty prospective applicants."

The means adopted for limiting the attendance was to deny admission to applicants deficient in more than one unit of the entrance requirements, applying the rule not merely to the total number of units offered, but also to the required subjects regardless of whether the total number of units offered and acceptable was equal to or even greater than the total required.

The same rules were rigidly applied during the current year, with the result as stated in the table. It will be noted that while the enrollment in the freshman class has thus been kept down, the total college enrollment has increased over nine per cent. This, of course,

is due to the enlargement of the upper classes consequent upon the increase in the freshman classes of the previous years. The net result is that, while we had fixed upon 300 as the upper limit for successful and adequate training under our present conditions and with our present equipment, we now have an enrollment of 336, and shall have next year with the same number in the entering class something more than 350, if the same ratios hold in the upper classes.

I call attention to these facts as having an especial bearing on requests for buildings and other equipment now before the legislature, reasons for which have been presented in a pamphlet already placed in the hands of the members of that body, and made a part of the present report.

It will be noted that no special six weeks' poultry students are listed for the year 1917. This is due to the fact that, on December 25, just before the time set for the opening of the 1917 poultry course, the instructional poultry building was destroyed by fire. The fire was caused by a defective lamp in one of the incubators which was being operated at that time. It was discovered by the night watchman, but not in time to save the building. A special report was made to your body shortly after the occurrence, and to this as preserved in the minutes of the Board reference is here made for details of the occurrence. The loss was approximately $4,000.

Analysis of Attendance for 1916-17.

TABLE II.

Showing Number of Men and Women, Number of New and of Previous Matriculates, and Number in the Several Courses, by Classes.

CLASS.	SEX		DATE OF MATRICULATION.		REGISTRATION IN COURSES.				
	Men.	Women.	Previous to 1916-17.	1916-17.	Agriculture.	Engineering.	Applied Sci.	Home Econ.	Total.
Graduates	5	1	4	2	2	....	3	1	6
Seniors	36	2	38	.....	10	21	5	2	38
Juniors	44	7	51	.....	10	29	5	7	51
Sophomores	81	13	94	.....	23	40	20	11	94
Freshmen	104	18	8	114	27	56	22	17	122
Irregulars	6	2	3	5	2	2	3	1	8
Total (college)....	276	43	198	121	74	148	58	39	319
Two-year	17	....	4	13	17	....	....	....	17
Winter Poultry.....	....	....	.....	.....	....	....	....	....	....
Final total.....	293	43	202	134	91	148	58	39	336

In connection with this table it should be noted (1) that the increase of women in the last three years is very slight, being only seven over two years ago; while, in the same time, the increase among the men has been 57, or twenty-six per cent. This stationary condition in the number of women in attendance is, I am persuaded, entirely due to the lack of proper accommodations, the fact being that the present number practically exhausts our available space both for dormitory facilities and for classroom and laboratory space in the vocational work. There is a great work to be done for the young women of our state in training for the duties of the home, and there is no provision elsewhere in the state for doing it. Reference is made in this connection to the appended report of the Board of Visitors of the current year.

(2) During the last three years there has been increase in the attendance on the courses in agriculture, applied science and home

economics, while that on engineering has remained stationary. In agriculture the increase has amounted to twenty-three and a third per cent. To the 91 enrolled in this course, as given in the table, there should be added 34 in the applied science course who are taking the agricultural option in that course, thus making a total enrollment in the agricultural course of 125. The increase in the applied science course in the three years is from 18 to 58, or two hundred and twenty-two per cent.; while in the home economics course it is 8, or twenty-six per cent. In the engineering courses the increase has been two.

(3) The decrease in the ratio of new students to old in the three years is gratifying. In 1915 the increase in the freshman class was somewhat phenomenal, amounting to thirty-six per cent. The abnormal number of new men gave them a ratio that was excessive, viz., forty-three per cent. to fifty-seven per cent. In the year 1917 it was thirty-eight per cent. to sixty-two per cent. On general principles it would seem that the normal ratio of the two should be about thirty per cent. to seventy per cent.

Home Residence of Students.

The following tables show the home residence of our students for the current year (1916-17):

A. Resident outside the State:

China	1	New York	1
Connecticut	17	Porto Rico	1
Massachusetts	55		
New Jersey	1	Total	76

B. (1) Resident in the State (by counties):

Bristol	8	Washington	76
Kent	28		
Newport	12	Total	260
Providence	136		

(2) Resident in the State (by towns and cities):

Barrington	2	Cranston	6
Bristol	6	Cumberland	1
Burrillville	4	East Greenwich	4
Central Falls	4	East Providence	14
Coventry	1	Exeter	1

Glocester	1	Richmond	1
Hopkinton	4	Scituate	5
Johnston	2	South Kingstown	30
Lincoln	4	Warwick	4
Little Compton	1	West Warwick	2
Narragansett	2	Westerly	30
Newport	11	Woonsocket	17
North Kingstown	8		
Pawtucket	22	Total	260
Providence	73		

As will be noted, the percentage of the students from Rhode Island is 77.4 per cent.

Entrance Statistics for the Class Registering in 1916.

Total enrollment of class	122	
Entering with condition on one-half unit	22	
Entering with condition on one unit	18	
Total	40	
Of these, number credited with a total of fourteen units or more	12	
Of these, number registered with less than a total of fourteen units by one unit or one-half unit	28	
Number without condition	82	
Average age of men and women of the class at entrance Oct. 1, 1916	19 yrs.	26 days
Age of youngest member of the class, Oct. 1, 1916	16 yrs. 9 mos.	27 days
Age of oldest member of the class, Oct. 1, 1916	27 yrs. 5 mos.	11 days
Average age of women of the class, Oct. 1, 1916	19 yrs. 5 mos.	19 days

Schools Represented in the Registration of the Freshman Class.

In Rhode Island:		La Salle Academy	2
Bristol—Colt Memorial	1	Technical High	21
Burrillville High	1	South Kingstown High	10
Central Falls High	3	Westerly High	15
Cranston High	2	West Warwick High	1
East Greenwich Academy	2	Woonsocket High	4
East Providence High	4	In Connecticut:	
Newport—Rogers High	3	New London Manual Training High	2
North Kingstown High	1	Stonington High	1
Pawtucket High	7	In Massachusetts:	
Providence—English High	2	Attleboro High	2
Hope Street High	3		

Blackstone High	1	Fall River—B. M. C. Durfee High	1
Boston—Mech. Arts High	1	Needham High	1
English High	1	Shelburne Falls High	1
High School of Commerce	2	Foreign Schools	2
Brockton High	3	Other Colleges	4
Essex High	1		

Repeating freshman subjects from last year and classed as freshmen..... 8
Entering by examination in whole or in part..... 9

122

Finances.

The year 1916 has been one of soaring prices and of great difficulty in maintaining adequate supplies of necessary articles. In the matter of coal alone, as an example, the added cost has been very heavy. At one time, through an embargo in force on the railways at that time, we were unable to procure soft coal ordered and had to buy from local dealers at local prices. It happened that we had at that time a considerable quantity of hard coal on hand, and it was well that we did, for the local supply of soft coal soon failed us, and we had to rely for some time on the hard coal in stock to feed the soft coal furnaces. The procedure was both wasteful and extremely costly, but there seemed no alternative.

Under very difficult conditions in every department, we deem ourselves extremely fortunate to be able to report the bills of the year paid with no deficit in any fund, and no trenching upon that part of the National funds properly reserved for the second six months of the National fiscal year. However, the margin of safety of $713.93 is uncomfortably close, and it has been evident to us for some time that we must safeguard ourselves for the future. (See treasurer's report.)

Your Board has deemed itself bound by announcements in the published catalog of one year ago as to price of board, tuition, incidental expenses, etc., so far as the current college year is concerned, extending to July 1, 1917. It has recognized, however, that it is under present conditions impossible indefinitely to maintain the low prices there announced.

For the college year beginning September 15, 1917, therefore, the following announcements have been authorized: The price of board for 1917-18 will be listed at $4.00, the right being reserved to make change in the rate as may appear necessary and the assurance being given that the rate will never be above actual cost. For persons not

resident in the state, matriculating after September 1, 1917, tuition will be $50 per year. Room rent will be raised from $30 to $40 per year, and the incidental fee for all students will be $10 per year.

The Reserve Officers' Training Corps.

The passage by Congress of the Army Bill approved June 3, 1916, has necessitated a reorganization of the work of all courses so as to provide (1) for a minimum of three hours per week of military training and classwork for all male members of the freshman and sophomore classes, and (2) for an optional five-hour per week course in military training and classwork for all members of the junior and senior classes electing to continue the work of the Reserve Officers' Training Corps and obligating themselves at the beginning of the junior year to continue it for the remainder of their course at college. This military work, both the required and the optional, is to count at its full hour-value for a degree in any course which the student is pursuing.

The material advantages accruing to the student are: (1) the Government provides the uniform for freshmen and sophomores, relieving them of the expense for this purpose formerly devolving upon them; (2) the Government agrees to furnish to those electing the service in the Reserve Officers' Training Corps at the beginning of their junior year the necessary uniform, and pay commutation of subsistence, amounting to eight or nine dollars per month, for the remainder of their college course. Those electing the military work of the last two years in college also obligate themselves to participate in two summer camps of four weeks each for which transportation and all other expenses are paid by the Government.

At the end of the four-year course young graduates, on the recommendation of the president and the commandant, may be appointed on application as temporary second lieutenants for service in the army for six months at $100 per month.

Outside the mere pecuniary advantages, the course itself is highly beneficial and should commend itself to our people.

Improvements During the Year.

By grant of the General Assembly of 1916 ten thousand dollars were made available for the construction of a sewage-disposal plant

and for the purchase of such furniture, etc., as the remainder of the said sum of money might make possible after paying for the said plant. The plant was successfully installed and is now in working order. It will supply the needs of the college in this direction for many years to come. In connection therewith the water supply, procured by connecting up the three wells now existing on the hill and installing a pumping station in the power plant, has been made available. Much-needed filing equipment in the main administration office, chairs for the main assembly hall, desks, chairs, blackboards for various classrooms, and equipment for various laboratories, especially the chemical, in which two rooms have been newly fitted up, have been procured or ordered. On account of the exigencies of the times in procuring material and transportation, much of the equipment ordered after the completion of the sewage-disposal plant had not arrived by January 1, 1917, and hence the reported balance of some $3,000 in that special fund. The installation of a new Bell telephone system by contract with the Providence Telephone Company should also be noted.

Statement of Needs for the Year 1917.

As portraying the situation in respect to needs for the year 1917, I am incorporating here (see Appendix B) reprint of a pamphlet generally circulated at the beginning of the year 1917 by authority of your Board.

Changes in Faculty During the Year.

Death of Mr. Thomas C. Rodman.

The college community was greatly distressed by the death of Mr. T. C. Rodman on November 18, 1916. He had been in failing health for some time and the end was not unexpected. Nevertheless it was impossible that a man of his long connection with the college, his great influence with faculty and students, and his large place in the affectionate regard of the community should pass from among us without a shock. The funeral, held in Wakefield, was attended by faculty and students; a memorial service was held at the college on December 14, 1916; and a small edition of a memorial pamphlet was issued and distributed among his friends. This con-

tained formal resolutions of Board of Managers and faculty, and the addresses of the memorial service.

Resignations and Appointments.

Resignations were accepted as follows:

George R. Cobb, Professor of Horticulture, taking effect September 1, 1916.

Frank O. Fitts, Assistant in Chemistry, Experiment Station, taking effect April 1, 1916.

Miss Jennie E. Koehler (now Mrs. Roy B. Cooley) Home Economics Instructor in Extension Service, taking effect July 1, 1916.

J. Stanley Beamensderfer, Instructor in Mechanical Engineering, and Walter S. Merrill, Instructor in Civil Engineering, both taking effect September 1, 1916.

The following new appointments have been made:

As Instructor in Horticulture, Paul E. Corriveau, B. S., New Hampshire State College, 1915; A. M., University of Missouri, 1916; Research Scholar in Horticulture during 1915-16.

As Extension Instructor in Home Economics, Gladys L. Meloche, B. S., University of Wisconsin, 1916, with experience as teacher in an interval of two years during her college course.

As Instructor in Spanish, Ramon A. Pla, native of Porto Rico.

As Instructor in Mechanical Engineering, William T. MacCreadie, B. S., Massachusetts Institute of Technology, 1911; M. S., Norwich University, 1916, with experience in practical work with Stone & Webster and others and in teaching at Norwich University.

As Instructor in Civil Engineering, Norman H. Whitehead, B. S., Brown University, 1914, and teacher at Salem High School (Mass.) for two years.

William J. Whalen, 1912, Assistant Superintendent of Buildings, was appointed Superintendent of Buildings on the death of Mr. Rodman, December 1.

The position of Vocational Adviser was created in September, 1916, and Mr. David S. Wheeler was appointed.

New Fraternity House.

Having obtained a loan of ten thousand dollars under the endorsement of the college as authorized by an act of the General Assembly approved April 13, 1916, the Delta Alpha Psi Fraternity entered into agreements to build a fraternity house for their use, and a cellar was dug in the fall by the students concerned.

Board of Visitors.

The following persons were appointed as a Board of Visitors for the years 1916 and 1917:

Miss Caroline Hazard, Peace Dale, Chairman.
Mr. Frank L. Pierce, Providence, Vice-Chairman.
Mr. Richard S. Aldrich, Warwick Neck.
Mrs. Eliza H. L. Barker, Tiverton.
Mr. John Fletcher, Providence.
Mr. George K. Tinkham, Warren.
Mr. Dudley E. Campbell, Newport.

Their preliminary report for the year 1916 is attached to this report.

Conferences with Brown University.

An interesting development of the year has been a series of conferences by committees of our faculty with committees of the faculty of Brown University, with the object of establishing closer co-operative relations between the two institutions. While no formal program has yet been arrived at, I think that much good has been done by increasing acquaintance and mutual understanding through the conferences alternately held at the two places.

Commencement.

At the Commencement held June 21, 1916, the degree of Bachelor of Science in course was awarded to thirty-nine students. The new degree of Master of Agriculture (M. Agr.) was bestowed on

George E. Adams, B. S., 1894.
Albert E. Wilkinson, B. S., 1906.
Harry R. Lewis, B. S., 1907.

The baccalaureate address, June 17, by the writer was on the subject, "America's Opportunity". The main Commencement address was given by Dr. Merrill Edwards Gates of Washington, D. C., under the title, "Prepared".

Respectfully submitted,

HOWARD EDWARDS,
President.

TWENTY-NINTH ANNUAL REPORT

of the

Director of the Agricultural Experiment Station.

To Howard Edwards, *President,*
Rhode Island State College.

Sir:—I submit hereby a brief account of such activities of the experiment station during the year 1916 as will indicate the progress which has been made in the more important lines of work.

In a report of progress such as this it should be understood clearly that a point of view which appears justifiable at a certain time in the prosecution of experimental inquiry may need considerable modification in the light of future work.

It is believed, however, that the public will appreciate brief annual statements and will not make the mistake of giving undue weight to the presentation of reports on unfinished problems.

Fortunately there were few changes in the station staff: Frank O. Fitts, assistant chemist, resigned in April; and Roland H. Hill, who was appointed as an assistant chemist in June, resigned the following October.

The Weather. Detailed records, taken about a mile distant from the experimental fields at about 130 feet higher altitude, may be found in the Climatological Report of the United States Weather Bureau. The last killing frost in the lowland in the spring was on May 19. In the fall the earliest light frost was on September 17; there was a killing frost on October 10. The spring was so unusually wet and cold that planting was delayed about two weeks. The extreme rainfall of 11.75 inches during July, and the accompanying disease, practically ruined the potato crop; for this reason scarcely any experimental results with this crop are recorded herein. The driest period during the summer was the last half of August, but this was not sufficiently pronounced so that any advantage was derived from the overhead irrigation of the beets, celery and spinach.

Publications. Those which have been issued since submitting the last annual report are as follows:

The bacterial infection of fresh eggs. Bul. 164, January, 1916, pp. 70.

Starch congestion accompanying certain factors which retard plant growth. Bul. 165, May, 1916, pp. 24.

The rôle of the flagellated protozoa in infective processes of the intestines and liver. Bul. 166, June, 1916, pp. 40.

A twenty-year comparison of different rotations of corn, potatoes, rye and grass. Bul. 167, June, 1916, pp. 38.

The avenue and development of tissue infection in intestinal trichomoniasis. Bul. 168, December, 1916, pp. 64.

Inspection bulletin containing analyses of commercial feeding stuffs. May, 1916, pp. 12.

Inspection bulletin containing analyses of commercial fertilizers. October, 1916, pp. 18.

Twenty-eighth annual report of the station. Bul. of Rhode Island State College, 11, 23-29.

The activity and availability of insoluble nitrogen in fertilizers as shown by chemical and vegetation tests. Jour. Ind. Eng. Chem., 1916, 8, 246-251.

The rearing of turkeys with special reference to the blackhead disease. Extension Bul. R. I. State College, 2 (new series), pp. 20.

Determination of the lime requirements of soils by the use of calcium bicarbonate. Jour. A. O. A. C., 1917, 3, 141-144.

Vegetable Matter for the Soil. When sown at the last cultivation of sweet corn in 1915 for winter cover crops to be turned into the soil the following spring, alfalfa did not thrive, winter vetch grew well until winter when it was all killed, sweet clover, although the stand was rather thin, withstood the winter well, and mammoth clover lived through the winter and was entirely satisfactory. The crop of early potatoes which followed seemed to be influenced by the degree of success with these legumes, for the total number of bushels per acre was 135 after alfalfa, 163 after winter vetch, 191 after sweet clover, and 200 after mammoth clover.

In a mixture of legumes sown as a cover crop in field corn which is planted every year on the same land, the vetch was dead in the spring, but there were scattering live plants of alfalfa, crimson clover and sweet clover, of which the latter were the most vigorous. Only 30 bushels of corn per acre were obtained after the mixed legumes were plowed in; but even less, 26 bushels, were obtained where rye 18 inches high was turned under, even though two and

a half times as much nitrogen was applied there in the fertilizer; this larger amount of nitrogen produced only 12 bushels, however, when no cover crop was grown.

In rotations of corn, potatoes, rye and grass, extending over a period of twenty years, vetch and clovers proved to be no better than rye as a cover crop planted in the corn and turned under prior to planting the potatoes the following spring; probably the nitrogen needs of the potatoes were quite well supplied by the fertilizer.

Raw muck used in comparison with stable manure to supply an equal amount of vegetable matter in connection with fertilizer chemicals was inferior for market garden crops, probably in part because sufficient lime has not yet been incorporated with the soil to counteract the acidity of the muck sufficiently to favor the growth of the sensitive crops.

In preparation for late celery, part of an early crop of lettuce was sacrificed in order to grow a crop of oats and peas which was turned under as green manure; thirty-two tons of manure alone resulted in 8.28 tons per acre (850 doz. bunches) of marketable celery, and eight tons of manure, together with the oats and peas and fertilizer chemicals produced 7.17 tons (760 doz. bunches).

In the greenhouse, carnations have grown nearly as well heretofore in sand to which fertilizer chemicals were added without vegetable matter, as in the usual compost of soil and manure; nevertheless, mild muck was added advantageously to the sand this year.

The importance of maintaining a supply of decomposing vegetable matter in the field was demonstrated where stable manure has been compared for a period of years with fertilizer chemicals: the sweet corn which followed early peas practically failed to produce a crop before frost where the fertilizer chemicals instead of the manure were used. These plats, however, have not had the advantages derivable from grass sod. On the rotation plats where the grass occupies the land for at least half the time, no disadvantage has arisen from using fertilizer chemicals instead of stable manure.

Efficiency of Manures. For top-dressing grass any substitution of nitrate of soda and acid phosphate by sulfate of ammonia, calcium cyanamid, floats or basic slag phosphate led to a decrease yield.

The first year following rye 5.9 tons of hay were obtained in the two crops by using, in addition to phosphorus and potassium, 35

pounds of nitrogen in nitrate of soda, and no greater yield was obtained with 48 pounds. From the fifth-year grass 4.2 tons of hay were obtained; a reduction in potash from 100 to 50 pounds did not depress the yield, but a like reduction in phosphoric acid seemed somewhat inadvisable.

The substitution of nitrate of soda by sulfate of ammonia has maintained an acid reaction of the lawn plats which has resulted in the elimination of weeds, although the grass grew less rapidly. Rhode Island bent and red fescue remain practically pure under the sour conditions.

Work on the availability of different sources of organic nitrogen, including that in fertilizers, was continued by means of pot culture.

Millet and rape grown both in the field and in pots showed that basic slag phosphate from a number of different sources compared favorably with soluble phosphates; in pots, floats or raw rock phosphate was inferior to acid phosphate even when four times as much phosphorus was applied and whether introduced into the soil with or without clover.

The yield per acre of field corn dependent upon phosphoric acid in different phosphates was as follows: from 120 pounds of phosphoric acid in acid phosphate 41 bushels; from 40 pounds in acid phosphate 33; from 90 pounds in floats (equal cost to the preceding) 26; from 40 pounds in ground bone 30, in double superphosphate 28, in basic slag phosphate 24, in floats 22; and with no phosphate 17; it made practically no difference whether four or six kernels were planted in a hill. A different application to corn of 54 pounds of nitrogen, 75 of phosphoric acid and 90 of potash produced 47 bushels, whereas a third less produced 42, and a third more 59.

The abnormally wet weather in July reduced the potato yields to such an extent that practically no difference resulted whether potassium was added in kainit, muriate, sulfate, double manure salt, or whether no potash had been added for six years.

In addition to 16 tons of stable manure for early cabbage, lettuce and tomatoes, 50 pounds of nitrogen, 100 of phosphoric acid and 25 of potash proved to be sufficient except in case of phosphoric acid. Although these amounts were supplemented for the second crops by 30 pounds of nitrogen, 50 of phosphoric acid and 25 of potash before planting beets, spinach and celery, respectively, the beet yields were increased especially where still more than the above mentioned

amount of nitrogen was added, the spinach where more potash and also where more nitrogen were added, whereas the celery received practically no benefit from extra amounts. Where 16 tons more of stable manure were added before these second crops, making 32 tons of manure alone during the season, the yields as compared with those where half this total amount of manure was supplemented with certain combinations of fertilizer chemicals were about the same of beets, less of spinach and more of celery.

Carnations have grown about as well with the soil and manure compost alone as where this was supplemented with fertilizer chemicals; it has been found unnecessary to change the soil each year.

Neutralization of Sour Soils. Four years ago when different-sized particles of the same limestone were applied, only those which passed through an 80-mesh sieve were equal in effect to slaked lime supplying the same amount of calcium oxid. In subsequent years, however, there has been a tendency for the coarser particles to become relatively more efficient, in comparison with the finer ones, than they were at first, and for the unsifted limestone to compare more favorably with the slaked lime.

No deleterious effect has developed from the use of lime products containing high percentages of magnesia.

It is too soon to observe whether a top-dressing of slaked lime or sodium carbonate (soda ash) will be of any advantage to alfalfa growing in soil which is somewhat sour.

The lime in basic slag phosphate was found to be readily available, but probably not as much so as in the carbonate form.

Red clover failed not only where there was insufficient lime, but also where available potassium was scarce, even though this lack was not accompanied by any change in acidity. No additional information of importance resulted where potassium was substituted in part by sodium.

Specific Plant Differences and Needs. The following results were obtained with different varieties of silage corn grown on the experimental field, in which a comparison is being made of cow manure with straw versus shavings as bedding:

	Tons of green corn per acre.	Dry matter, per cent.	In Dry Matter.			Relative amount of latter per plat.	Green ears, lbs.
			Fiber, per cent.	Crude protein, per cent.	All except fiber and ash, per cent.		
Eureka	25.7	19.4	28.0	7.0	66.2	100	69
Ninety-day red dent.....	18.7	22.2	22.8	8.5	72.3	93	134
Red cob	17.1	20.5	24.3	8.2	70.3	90	138
Early yellow dent.....	17.0	21.7	27.8	7.1	67.5	80	109
Improved leaming	16.2	21.7	23.7	8.6	71.3	86	162
Brewer's yellow dent....	15.5	24.9	20.2	8.0	75.1	92	94
Connecticut dent	14.1	22.7	23.9	8.3	71.1	72	111
Mammoth white	12.0	23.8	22.3	7.7	72.9	69	94
Mammoth yellow flint...	11.7	24.5	20.4	8.3	73.2	71	72
Webber's early dent.....	10.8	27.5	24.1	7.1	71.0	69	102

The yields given in the first column were based on seven times the area from which the data in the subsequent columns were derived. It may be seen that although Eureka corn has the least percentage of the more valuable constituents, namely, 66.2, it produced the greatest total weight of these because of its high total yield per plat.

Of the plants which have been grown during the last two years to compare further their lime requirements, sugar beets proved most in need of lime, pumpkins and rape next, Sudan grass and carrots next, whereas lime depressed the yield of watermelons.

Pot and plat experiments on the omission of individual fertilizer ingredients continued for a number of years showed that in pots the needs of barley, rye, oats, millet and buckwheat increased in the following order: potassium, nitrogen, phosphorus. In the field in 1916, however, the order with the latter crop only was phosphorus, potassium, nitrogen.

By growing barley entirely in solution, its absolute nutrient requirements have been studied; it has been found, for example, that over 600 parts of normal, dry, mature plants can be produced from 1 part of phosphoric acid; these contain only a third as high a percentage of phosphoric acid as the average field crop of barley. If the necessary requirements of crops can be ascertained, it will be

possible by analyzing a field crop to know if it contained enough of a given substance for the production of a normal crop; if so, a small yield would have to be explained by some cause other than a scarcity of the ingredient in question.

Effect of Plants on Others. In 1913 buckwheat was grown without fertilizer, following a number of different crops. Onions, rye, buckwheat and redtop, after which 21, 21, 13 and 10 bushels of buckwheat per acre, respectively, were then obtained, and which have been grown since for two years in pots under various fertilizer conditions, were all followed in 1916 by buckwheat similarly as in the field, with the result that the yield was again best after onions and rye, next after buckwheat, and least after redtop. In 1916 alsike clover was the crop which was planted over the entire field; it yielded the most hay following potatoes, rye, redtop and squashes, about two tons; and decidedly the least following red clover, 1.4 tons; and following alsike clover itself, 1.3 tons.

Where 15 pounds of soy beans per acre were planted with 15 pounds of Eureka silage corn there was nearly as much corn as where 15 pounds of corn were planted alone, and the yield was increased about a sixth by the beans. When the above rate of seeding was doubled, the yield of corn was decreased to such an extent that the beans scarcely made up for the difference. It was ascertained that the beans had no positive effect in increasing the nitrogen content of the corn itself, though they undoubtedly did increase that in the mixture of the two crops.

Inheritance Studies with Poultry and Rabbits. The sixth year of work on the inheritance of egg weight has been completed and the results await analysis before conclusions can be drawn.

Concerning the inheritance of plumage characters in poultry, data have been collected which throw light upon the manner of inheritance of blue coloration, and of buff. In the latter case a sex-linked factor for inhibition has been discovered in the White Plymouth Rock.

Body weight curves for a full year have now been obtained for two primary breeds of poultry which in the coming season will be cross-bred in order to obtain weight curves for the first cross-bred generation.

The selection experiments on the inheritance of the English character in rabbits have been held in check by a fatal disease which attacked the rabbitry. Methods of eliminating the disease are being sought.

Studies on Immunity and Infection. The relations between *Bact. pullorum,* fowl typhoid types, and the group of paratyphoids have received further study. Observations made on the variability, under different conditions, of the agglutination reaction in *Bact. pullorum* infections suggest a certain lack of specificity.

Active work involving the bacteriology of eggs under conditions of infection has been started as a second phase of the general subject.

Blackhead of Turkeys. During the past season new methods of feeding have been tried, the birds themselves being on the range. A larger proportion of turkeys than heretofore were raised free from the blackhead disease. Owing to the unfavorable season, other maladies made their appearance and caused heavy losses. Through the means of histological studies the avenue of infection of the intestinal wall has been discovered.

Respectfully submitted,

BURT L. HARTWELL,
Director.

REPORT OF THE EXTENSION SERVICE.

Personnel.

Owing to a severe illness Director A. E. Stene was not able to take charge of the extension service from March to December, 1916. In April, 1916, David Elder, State Leader of County Agent work in the Extension Department, resigned to take a position as County Agent in Providence and Bristol Counties. From March to December I have had to assume the responsibility for both positions; namely, Extension Director and State Leader of County Agent work.

I wish to acknowledge the very valuable help of Mr. Ernest K. Thomas. He assumed and carried on the routine work, reorganized the office itself, and placed it on a more efficient basis. Without his constant and intelligent assistance it would have been impossible for me to carry the added burden of these two offices.

Miss Jennie Koehler, Home Economics Demonstrator, resigned June 30, 1916, and Miss Gladys L. Meloche was appointed in her place.

Miss Mildred Riley, who was in charge of the office force, resigned in September, 1916, and Miss Jessie Vroom was appointed in her place.

Administration.

It is very necessary that the extension specialists, including the county agents, shall represent the agricultural departments of the college and the experiment station. The experiment station workers and the heads of the college departments should be in touch with the extension work conducted in the state. To bring about this coöperation a general conference was held early in the spring of 1916. As a result we now have several committees on subject matter representing the college experiment station and extension department. These committees will act in an advisory capacity to the county agents and extension workers. Efforts have been made this year to encourage the people of the state to apply the information brought to them by our extension specialists in their own homes and on their own farms.

Several changes have been brought about in connection with the rules and regulations governing the extension service, all of which tend to make the work of this department more efficient.

Projects.

The work of the Extension Service for the year has consisted of the following projects: Boys' and girls' clubs in agriculture and home economics;

county agent work; agronomy demonstrations; poultry husbandry and home economics.

Boys' and Girls' Club Work.

The objects of this work are: to demonstrate through the boys' and girls' work the best farm and home practices; to cultivate in boys and girls habits of industry and thrift and to show them the possibilities of the farm and country life; to enlarge the vision of young people and to give them definite purposes at an important period of their lives; to bring the school life of the boy or girl into closer relationship with their home life; and to encourage them to continue their education, if possible, through high school and college.

During the year thirteen club projects have been conducted as follows: corn, potato, market garden, flower garden, allotment garden, canning, baking, sewing, cooking, pig, sheep, poultry, and handicraft work.

The total enrollment for the state was approximately 3,000.

Complete reports received from 1,453 boys and girls.

Value of club products reported, $12,424.93.

Total cost of production reported, $6,016.08.

Supervisory cost of club work in state, $5,000.

Net profit to state after deducting all costs, $1,016.08.

Reports received from club members too late to be included in this report or reports which are incomplete have been received to the number of 1,613.

In connection with this work the state leader of club work, Ernest K. Thomas, has given a great many lectures and demonstrations, held several club meetings, visited a large number of the club members' homes, and held conferences with groups of local leaders and teachers throughout the state.

County Agent Work.

The most important phase of the county agent work during the year has been the establishment of the farm bureaus themselves and the installation of the county agents under the bureaus. The soundest and most important work of the county agents has been in securing the confidence and sympathy of the farmers and establishing among them the spirit of active appreciation and support through individual counsel and advice in their problems, through effective demonstrations on the farms themselves, and through boys' and girls' clubs in which the parents and other adults have uniformly proved deeply interested and from which the latter have learned as much as have the boys and girls. As a result of such work in the state may be mentioned the building of 45 silos in Washington and Kent Counties during the year; the organization in the state of several farmers' clubs and associations; the publication of the Farm Bureau News; the purchase of pure bred sires and cows; the encouragement of the poultry organizations, and a larger spirit of confidence and co-operation among the farmers in general.

In Farm Bureau District No. 1, Washington and Kent Counties, S. N. Stimson has been employed as county agent since October, 1915. Some of his chief lines of work have been: demonstrations in constructing silos,

pruning, spraying, forage crops, use of fertilizers, purchase, feeding, and management of live stock, farm management surveys, organization of farmers' clubs, boys' clubs, preparing articles of interest to farmers for local press and for circular letters, trips with groups of farmers to educational exhibitions and to successful farms.

In Farm Bureau District No. 2, Providence and Bristol Counties, David Elder has been employed as county agent since April, 1916. Some of his chief lines of work have been: demonstrations in top dressing meadows, forage crops, pruning and spraying, use of fertilizers, visits to farmers to assist them with local problems, organization cow test associations, farmers' clubs for the study of agricultural problems, advice regarding co-operative marketing associations, preparation of articles for local press of interest to farmers, and circular letters.

Agronomy Demonstrations.

In this work the agronomy demonstrator, Myron A. Hawkins, conducts field demonstrations along various agronomy lines, on farms in different parts of the state. The idea of this work is to bring to the attention of the farmer the value of new methods of field-crop production and of new kinds and varieties of crops.

The lines of work undertaken during the past year are as follows: Variety tests of Silage Corn were located on ten farms in different sections of the state. The four highest yielding varieties averaged as follows: Eureka, 19. tons; Early Yellow Dent, 15.86 tons; Improved Leaming, 14.83 tons; and Brewers Yellow Dent, 14.27 tons per acre (green weight). Farmers have been assisted in putting in 20 plots of alfalfa and careful records were kept on the cost of growing the crop in order to help farmers decide for themselves whether or not to grow alfalfa. In ten demonstrations the average cost of putting in and harvesting the alfalfa was $53.56 per acre, while the average returns during the first year were 4.17 tons per acre; value at $15 per ton, $62.85. Ten demonstrations were conducted to show the value of soy beans as a supplementary silage crop; eight demonstrations to show the value of common salt in the fertilizer mixture when potash is scarce. Three seed corn growers were given instructions in and assisted in carrying on the ear-to-row method of breeding to improve their seed corn.

The co-operative purchase of hardy strains of alfalfa seed of the Grimm type has been encouraged. Correspondence in regard to crops were answered, samples of soil tested for acidity, and suggestions offered in regard to the use of fertilizers. Agricultural exhibits were prepared and displayed at nine fairs during the fall.

Home Economics.

The extension work in home economics has been carried on by Miss Jennie E. Koehler up to July 1, 1916. Miss Koehler resigned at this time and Miss Gladys L. Meloche has been in charge of the work since that time. Seven-

teen eight-weeks home economics classes for women have been conducted during the year in several parts of the state. Five hundred and eleven women have been enrolled in these classes. The women attending the classes apply the information brought to them by the home economics demonstrator in their own homes and report on their success with the work at the next class meeting.

Sixty lectures and demonstrations of various kinds have been given before organizations in the state. The attendance at these meetings totaled 3000.

Several advisory trips to the homes of interested women have been made and many helpful suggestions have been made on household management.

Poultry Husbandry.

The extension work in poultry husbandry has been in charge of D. J. Lambert. A practical home reading course on poultry husbandry consisting of ten lectures has been prepared. Forty-two persons have taken up this course during the year and reports show that they are finding the courses helpful. Twenty-nine lectures have been given before various organizations in the state. Six judging demonstrations have been given and several advisory trips to poultry farms have been made during the year.

Several tests for Bacillary White Diarrhoea have been made for poultry men in coöperation with Dr. Phillip B. Hadley of the Experiment Station. A poultry bulletin for the use of poultry clubs in connection with the boys' and girls' clubs has been prepared.

The foregoing is a brief summary of the work of the extension service for the year 1916.

Respectfully submitted,

HOWARD EDWARDS,

President, and Acting Director Extension Service to Dec. 1.

REPORT OF THE TREASURER.

R. S. BURLINGAME, TREASURER, *in account with the different funds of* RHODE ISLAND STATE COLLEGE, *for the year ending December* 31, 1916.

MORRILL FUND OF 1890 AND NELSON ACT OF 1907.

1916.		Cr.	Dr.
Jan. 1.	To balance from last year		$24,819 37
July 1.	United States warrant year ending June 30, 1917		50,000 00
Dec. 31.	By instruction	$43,013 06	
	Apparatus	1,392 26	
	Tools and machinery	275 12	
	Live stock	88 25	
	Feed	1,814 50	
	Textbooks and reference books	483 16	
	Seeds	292 57	
	Gasolene	162 90	
	Chemical supplies	1,750 44	
	Fertilizers	27 10	
	Periodicals	12 75	
	Miscellaneous	681 72	
	Balance on hand	24,825 54	
		$74,819 37	$74,819 37

MORRILL FUND OF 1862.

Jan. 1.	To cash from land scrip fund		$2,500 00
Dec. 31.	By instruction	$2,500 00	
		$2,500 00	$2,500 00

SMITH-LEVER FUND OF 1914.

Jan. 1.	To balance from last year		$4,658 31
July 1.	United States warrant year ending June 30, 1917		10,400 24
Jan. 1.	United States warrant, final payment, year ending June 30, 1916		109 16
Dec. 31.	By salaries	$7,837 06	
	Postage, telephone, telegraph, freight and express	18 59	
	Seeds, plants and sundry supplies	8 84	

Stationery and printing	28 25		
Traveling	1,618 47		
Scientific apparatus	4 00		
Furniture and fixtures	4 50		
Labor	93 35		
Tools and machinery	79		
Balance on hand	5,553 86		
		$15,167 71	$15,167 71

STATE—MAINTENANCE FUND.

Jan. 1.	To State appropriation			$40,000 00
Dec. 31.	By salaries	$11,788 40		
	Labor (janitor, farm, etc.)	7,664 08		
	Traveling	1,704 70		
	Postage, stationery and printing	2,557 24		
	Construction and repairs	4,227 13		
	Fuel	6,409 23		
	Feed	464 91		
	Rental of dormitories and land	1,151 94		
	Oil and gasolene	591 46		
	Telephone and telegraph	92 49		
	Commencement	314 99		
	Stable supplies and auto repairs	536 72		
	Furniture and fixtures	234 21		
	Freight and express	9 52		
	Horseshoeing	41 20		
	Janitor's supplies	186 37		
	Apparatus	233 12		
	Tools and machinery	145 20		
	Entertainment	250 81		
	Fertilizers	324 43		
	Seeds	33 32		
	Miscellaneous	1,038 53		
			$40,000 00	$40,000 00

STATE—REPAIRS AND IMPROVEMENTS.

Jan. 1.	To balance on hand from last year			$635 61
May 1.	State appropriation			10,000 00
Dec. 31.	By water supply	$972 28		
	Physics department	420 00		
	Electrical department	55 00		
	Zoölogy department	415 75		
	Chemistry department	140 64		

Physical education department	36 95	
Executive office	560 75	
Davis Hall, furniture	485 28	
Furniture	1,166 34	
Sewage system	2,892 40	
Balance on hand	3,490 22	
	$10,635 61	$10,635 61

Current Fund.

Jan. 1.	To balance on hand from last year		$271 43
	Reserve fund		2,000 00
	Department sales		8,160 38
	Department service		1,147 39
	Department fees		3,004 78
	Laboratory sales		1,697 20
	Dormitory fees		6,211 22
	Tuition		2,007 31
	Interest		1,288 59
	Miscellaneous		797 10
Dec. 31.	By salaries	$3,071 60	
	Labor (student, janitor, farm, etc.)	7,725 62	
	Traveling	656 99	
	Postage, stationery and printing	650 99	
	Freight and express	472 05	
	Advertising in publications	653 60	
	Feed	706 94	
	Fuel	4,258 07	
	Entertainment	880 52	
	Construction and repairs	1,608 24	
	Telephone and telegraph	408 69	
	Oil	173 90	
	Apparatus	338 89	
	Horseshoeing	16 00	
	Stable supplies and auto repairs	90 82	
	Furniture and fixtures	73 16	
	Tools and machinery	63 50	
	Books	108 28	
	Horse labor	14 47	
	Rental of dormitories and land	361 40	
	Refund	135 51	
	Miscellaneous	1,402 23	
	Reserve fund	2,000 00	
	Balance on hand	713 93	
		$26,585 40	$26,585 40

TRUST FUND.

Jan.	1.	To balance on hand from last year		$3,387 13
		Boarding receipts		33,478 03
		Store receipts		6,759 37
Dec.	31.	By boarding	$33,412 37	
		Store	6,990 91	
		Balance on hand	3,221 25	
			$43,624 53	$43,624 53

HATCH FUND. EXPERIMENT STATION.

Jan.	1.	To balance on hand from last year		$657 20
		United States check for quarter		3,750 00
		United States check for quarter		3,750 00
		United States check for quarter		3,750 00
		United States check for quarter		3,750 00
Dec.	31.	Amount overdrawn		109 96
Dec.	31.	By salaries	$7,269 97	
		Labor	3,463 04	
		Publications	1,331 88	
		Postage and stationery	182 94	
		Freight and express	120 38	
		Heat, light, water, and power	328 11	
		Chemical supplies	210 53	
		Seeds, plants and sundry supplies	991 54	
		Fertilizers	526 47	
		Feeding stuffs	524 55	
		Library	381 60	
		Tools, implements and machinery	236 93	
		Furniture and fixtures	9 72	
		Scientific apparatus	5 30	
		Traveling expense	2 32	
		Building and land	161 88	
		Contingent expense	20 00	
			$15,767 16	$15,767 16

ADAMS FUND. EXPERIMENT STATION.

Jan.	1.	To United States check for quarter		$3,750 00
April	1.	United States check for quarter		3,750 00
July	1.	United States check for quarter		3,750 00
Oct.	1.	United States check for quarter		3,750 00
Dec.	31.	Amount overdrawn		777 11
Dec.	31.	By debit balance from last year	$1,447 21	
		Salaries	6,859 81	

Labor	3,989 46	
Postage and stationery	41 44	
Freight and express	45 63	
Heat, light, water and power	491 02	
Chemical supplies	271 73	
Seeds, plants and sundry supplies	367 47	
Fertilizers	50	
Feeding stuffs	1,327 86	
Library	39 45	
Tools, implements and machinery	315 56	
Furniture and fixtures	5 45	
Scientific apparatus	144 56	
Live stock	187 83	
Traveling expense	7 30	
Buildings and land	233 58	
Contingent expenses	1 25	
	$15,777 11	$15,777 11

MISCELLANEOUS. EXPERIMENT STATION.

Jan. 1.	To balance on hand from last year			$4,719 22
Dec. 31.		Department sales		2,968 77
		Department service		140 31
		Interest		173 00
		Miscellaneous		3 80
Dec. 31.	By labor		$396 20	
		Feeding stuffs	132 35	
		Postage and stationery	50 80	
		Freight and express	183 91	
		Library	18 00	
		Tools and machinery	172 11	
		Scientific apparatus	40 25	
		Chemical supplies	54 22	
		Fertilizers	172 34	
		Heat, light, water, and power	207 56	
		Live stock	27 25	
		Traveling	121 74	
		Furniture and fixtures	4 50	
		Buildings and land	602 49	
		Seeds, plants and sundry supplies	148 15	
		Publications	174 58	
		Contingent expense	27 75	
		Balance on hand	5,470 90	
			$8,005 10	$8,005 10

Summary of Funds Exclusive of Experiment Station.

Total income, including balances:		
United States—1890	$74,819 37	
United States—1862	2,500 00	
United States—1914	15,167 71	
		$92,487 08
State:		
Maintenance	$40,000 00	
Repairs	10,635 61	
		$50,635 61
Institution:		
Current	$26,585 40	
Trust	43,624 53	
		$70,209 93
		$213,332 62
Total expenditures:		
United States—1890	$49,993 83	
United States—1862	2,500 00	
United States—1914	9,613 85	
		$62,107 68
State:		
Maintenance	$40,000 00	
Repairs	7,145 39	
		$47,145 39
Institution:		
Current	$40,403 28	
Trust	23,871 47	
	$64,274 75	$173,527 82
Balance on hand		$39,804 80
Balance held as follows:		
Morrill Fund—1890	$24,825 54	
Smith-Lever—1914	5,553 86	
State—Repairs	3,490 22	
Current	2,713 93	
Trust	3,221 25	
		$39,804 80

I hereby certify that the above is correct and true, and truly represents the details of expenditures for the period and by the institution named.

R. S. BURLINGAME,
Treasurer.

This is to certify that we, the undersigned, auditing committee of the Board of Managers of Rhode Island State College, have examined the accounts of R. S. Burlingame, treasurer of the said college, and find the same correct.

THOMAS G. MATHEWSON,
CHARLES ESTES,
Auditors.

APPENDIX A.

Summaries Dealing with Certain Phases of Receipts and Expenditures for the Year Ending June 30, 1916.

Summary for Year.

Balance on hand July 1, 1915	$24,121 90
Total income during year	210,273 42
Total	$234,395 32
Total expenditure during year	198,650 40
Balance on hand June 30, 1916	$35,744 92

Income.

Income from students:		
Tuition fees	$2,020 97	
Matriculation and incidental fees	2,917 48	
Chemicals and laboratory supplies	1,547 24	
Dormitory fees	5,937 64	
Dining hall	32,309 56	
Store sales	4,624 48	
		$49,357 37
Income from State and Nation:		
State—Maintenance appropriation	$45,000 00	
Repairs and improvements	10,000 00	
		$55,000 00
Federal—Morrill Act of 1890 and Nelson Act of 1907	$50,000 00	
Morrill Act of 1862	2,500 00	
Hatch Act of 1887—Experiment Station	15,000 00	
Adams Act of 1906—Experiment Station	15,000 00	
Smith-Lever Act of 1914—Extension	10,218 31	
		$92,718 31

Income from other sources:		
Sales and service of departments	$9,524 70	
Interest	1,190 75	
Experiment Station—Sales and service	2,323 00	
Interest	159 29	
		$13,197 74
Total income		$210,273 42
Receipts from tuition:		
Students taking course of one year or more		304
Students taking poultry course of six weeks		7
		311
Number of students paying tuition (non-resident in Rhode Island) at rate of $30 per year		73
Amount of tuition paid		$2,020 97

Expenditures.

Expenditures, exclusive of Experiment Station and Extension Service:		
Advertising, including track meet	$1,443 47	
Apparatus	2,059 86	
Boarding	33,836 25	
Books and periodicals	562 09	
Commencement	699 72	
Construction and repairs	10,313 34	
Dormitory rentals	1,320 92	
Entertainment	644 95	
Feed	2,232 72	
Fertilizer	337 03	
Freight and express	433 47	
Fuel	10,923 15	
Gasoline and oil	1,102 01	
Labor (engineers, poultrymen, farm, etc.)	8,965 46	
Labor (undergraduate)	6,176 42	
Live stock	65 00	
Postage, stationery and printing	2,703 66	
Salaries	56,629 42	
Store	4,967 62	
Telephone and telegraph	148 69	
Tools and machinery	226 09	
Traveling	2,004 55	
Miscellaneous	6,039 26	
		$153,835 15
Expenditures, Experiment Station		33,011 76
Expenditures, Extension Service		11,803 49
Total expenditures		$198,650 40

Summary of Balances, July 1.

		1915.		1916.
Morrill Fund of 1862		.....		.....
Morrill Fund of 1890		.....		$708 64
Hatch Fund, Experiment Station		.....		.....
Adams Fund, Experiment Station		.....		.....
Smith-Lever Fund, Extension Service		.....		.....
State—Maintenance		$13,012 86		$13,338 99
State—Repairs and Improvements		4,767 07		9,525 00
Current Fund	Dr.	1,346 76		6,882 86
Trust Fund		1,394 03	Dr.	475 80
Miscellaneous—Experiment Station		4,294 70		3,765 23
Reserve Fund		2,000 00		2,000 00
Totals		$24,121 90		$35,744 92

APPENDIX B

Needs of Rhode Island State College

As presented to the General Assembly of 1917

The Board of Managers of Rhode Island State College, at regular meetings held November 23 and December 21, 1916, authorized the introduction into the General Assembly of 1917 of a resolution asking for an appropriation for the following purposes and amounts:

1.	To construct a building for the departments of Agriculture and Home Economics.....	$80,000.00
2.	To furnish said building.....	20,000.00
3.	To buy land for farm.....	10,000.00
4.	To buy additional cattle.....	4,000.00
5.	To enlarge poultry plant.....	3,000.00
6.	To buy an additional motor truck.....	2,500.00
	Total special appropriation asked for....	$119,500.00

Of this total amount the resolution provides that $59,500 be made available during the year 1917, and $60,000 during the year 1918.

(1) The building contemplated is to be of stone and of the same approximate size and architectural character as Science Hall. It will provide for the following accommodations:

(A) For the Agricultural Department—

Basement: a farm-machinery laboratory, a stock-judging room, a cement-working laboratory, a soils storage room, room for ventilation apparatus and refrigerating machine, refrigerator room, with three compartments, dairy manufacturing room, small greenhouse (detached), for soils and farm crop work.

First floor: four recitation rooms, a registration room, and three office rooms.

Second floor: milk test laboratory, pomology and spraying laboratory, advanced dairying laboratory pedigree room, two offices.

Third floor: soils laboratory, farm crops and farm management laboratory, agronomy and horticulture museum, drawing room for landscape gardening.

(B) For the Home Economics Department—

Separated from the foregoing by fire-walls, and having separate entrances.

Basement: kitchen, storeroom, laundry, etc.

First floor: dining-rooms and kitchens (for practice classes and for general use), cooking laboratory, pantry, recitation room, reference room, dean's quarters, general living-room or social room.

Second and third floors: sewing laboratory, textile room, dormitory rooms for approximately fifty young women.

REASONS FOR BUILDING.

The college has now arrived at a stage where larger and better facilities for the teaching of agriculture and home economics are essential. Through the construction of Science Hall in 1912–13, the basal sciences on which the vocational teaching of agriculture and home economics rests have been satisfactorily housed and equipped, and the greater dignity and efficiency so acquired have had their effect in the larger numbers taking the courses.

The vocational work has never been properly provided for. Although excellent work in agriculture and home economics has been done, and our students have compared very favorably indeed with the students of other colleges, whenever they have come into competition, yet the facilities and equipment with which we have had to work have always been far

inferior to those of the other New England colleges. With the increase in numbers in the last few years, it has become practically impossible to continue work under our primitive conditions and get creditable results.

A reference here to certain facts concerning the college would seem to justify the statement that it has won an established place in the service of the people and has a recognized function in the economy of the state.

Through the experimental work of the college the farming interests of the state have been and are being benefited greatly. It commands the hearty and enthusiastic support of all. The extension work is reaching thousands, both in city and country. The boys' and girls' clubs alone number 2500. In the teaching departments, constituting the college proper, the attendance has increased year by year, and now numbers 331. This is an increase over the previous year of nine per cent. Not only so, but the college has long ago ceased to be in any sense a local institution, and is drawing its students, not merely from the town in which it is located, but from all the population centers of the state, as witness: from Newport, 11; from Woonsocket, 16; from Pawtucket, 22; from Westerly 29, and from Providence, 86.

In the last few years no great effort has been made to increase attendance. On the contrary, during the years 1915 and 1916, the policy of repression, of keeping the numbers down, has been tried and has met with disapproval on all sides. Moreover, during these very years, notwithstanding the efforts at repression, the increase in college attendance has been twenty-three and a half per cent.

Furthermore, a comparison of what is being done for the state college in Rhode Island with what other New England states are doing for their state colleges does not show that the support given to this college has been relatively large.

In population and wealth the New England states rank as stated in the first column of the table below, taking the population of Rhode Island as 100.

Statistics relating to the state college in each of the six New England States:

Relative Rank in Population and Wealth		Land Acreage owned by State College	Value of Land of State College
Vermont.....	66	338	$75,000
New Hampshire.....	80	410	40,000
Rhode Island.....	100	169	14,800
Maine.....	140	970	50,500
Connecticut.....	206	706	30,000
Massachusetts.....	621	540	80,700

Value of Buildings	Total Value of Property
Vermont..... $1,117,000	$2,521,000
New Hampshire..... 400,000	1,519,000
Rhode Island..... 320,000	528,500
Maine..... 633,131	1,273,000
Connecticut..... 525,000	805,000
Massachusetts..... 695,000	1,530,000

These figures are all taken from the latest available Report of the United States Commissioner of Education, that for the year 1914, with the exception that the figures for Maine are for the year 1916, and are taken from Fernald's History of the University of Maine, just issued.

It will be noted that in land, buildings, and total property, our college is much below the institutions of the other states.

~~The total number of~~ Students now receive vocational instruction in Agriculture in five different buildings widely separated on the campus. The rooms were, with one exception, planned for not over one fourth the numbers now enrolled in the department. Laboratory classes have to be sectioned and sub-sectioned in many cases, thereby creating waste of the teachers' time and energy; a waste which, because of the smallness of our corps of teachers, cannot work otherwise than to the detriment of the instruction. No laboratory in the department is supplied with gas, and none with running water at the desks.

Much of the classwork, as, for instance, that in farm machinery and that in stock-judging, has to be carried on either out-of-doors or in open sheds or storage places. In cold or stormy weather it is practically impossible to hold the classes, and at no time is the work carried on under in any degree dignified or inspiring conditions. Courses in such subjects as farm crops and pomology depend largely for efficiency on adequate illustrative material which we do not have on account of lack of storage room. Many students have been repelled from taking the work of this department because of the inefficient and unattractive quarters now used by the agricultural department.

A very important line of development in our state is that of two-year short course work for young men already engaged or looking to immediate engagement in practical work. Much immediate benefit to the agriculture of the state can be brought about through these courses, and many states are developing a large work in this direction. New Hampshire, for instance, has an attendance of 117 on its four-year agricultural courses and 118 on its two-year courses. We are greatly handicapped in undertaking large development in this direction by the meagreness and insufficiency of our accommodations and equipment.

The vocational work of the women's course is similarly limited. We have now an enrollment of 41 women. This enrollment fills up our women's dormitory and leaves no opportunity for enlargement. Furthermore, the classrooms and laboratories for the vocational work of this department are both entirely inadequate and very undesirably situated.

There is a large work in this state in training and equipping women for their lifework that needs to be done. It is a recognized part of the work for which the Morrill funds are intended, and there is in the state no other institution beyond the high school that is attempting to meet the need.

Other New England state colleges are earnestly striving to do this work and are successfully equipping themselves for it. New Hampshire has a registration of 113 women.

In Maine the attendance of women has increased in five years from 44 to 167. Under our modern conditions not even the development of scientific agriculture itself is more important than the protection of home life, and the development of efficiency in dealing with its problems. If ever efficiency were needed, it is needed in these days of high cost for all the necessaries of life. Wise administration of the family income is as essential as increased earning power to enlarge the family income.

(2) Furnishing of the building. The experience gained in furnishing Science Hall, for which the same amount was granted, warrants the statement that the fund asked under this head is needed in its entirety to procure the absolutely essential things.

(3) Purchase of land. This is a request of several years' standing. I quote from the report of 1915:

"The total amount of land owned by the college is 169½ acres. It is divided as to use as follows:

Quadrangle, adjacent grounds for building sites	34	acres
Roads	6	"
Experiment Station plots	37	"
Pasture, cattle paddocks, etc	16½	"
Poultry plant	13	"
Orchards and gardens	17	"
Arboretum	6	"
Woods and waste land	20	"
Land used for farm crops	20	"
	169½	acres

"This twenty acres of farm land available for actual farm practice, if it were located in a compact body, would be absurdly small for teaching and illustrating to sixty or more students the principles of farm management and administration; but, as a matter of fact, these twenty acres are scattered in patches and left-over lots ranging from two to six acres and separated from each other, in some cases, by a distance of nearly a mile.

"Under such conditions economic farming as a business becomes out of the question. The average farm in New England has 104.4 acres."

As a matter of comparison, attention is called to the facts of column 2 in the table presenting statistics of the six state colleges of New England given in the earlier part of this paper. Every farmer familiar with the conditions and every Board of Visitors has insisted that the college should have more land.

(4) Purchase of cattle. This also is a request that has been repeated from year to year. The report of 1915 said:

"For instructional purposes and for leading and aiding in improving the grade of cattle kept by farmers throughout the state, money should be expended here from time to time in buying choice specimens of new strains of cattle. At the present time and for several years past no money has been available for this purpose, with the result that our cattle do not interest either student or visitor as they should be capable of doing. The situation has been of long standing and should be remedied."

(5) Construction of poultry houses. The poultry department stands in very great need of new and modern poultry buildings. This state is largely interested in the poultry industry and this college was the first to introduce poultry instruction. Yet since the very beginning little has been added in the way of construction. It is quite necessary that something be done in this direction in order to enable the college to maintain its standing in any degree.

(6) Buying of motor truck. The purchase of an additional motor truck is made necessary in two ways: by the fact that the college horses are dying off through old age, and by the increase of traffic to be carried. The college now owns four horses only. Of these two are practically incapacitated for work by age. One other is now nineteen years old. There remains only one fairly serviceable horse. The number of

students transported daily as required by state law has doubled in the last two years, while the freight has also greatly increased. This situation should as a matter of economy be promptly met. It is much cheaper to own and operate the transporting machines than to hire the transportation.

APPENDIX C

Report of the Board of Visitors

For the year 1916

To the Board of Managers of Rhode Island State College.

GENTLEMEN:

The Board presents its report for 1916, preliminary in part, owing to the short time since its appointment late in the year.

The Board of Visitors finds the college successfully working with the people of the State, rendering services vital to the community, and in all essentials complying with the provisions of the acts under which it operates. As a result and in appreciation of this work, applications for admission are increasing. The college is overcrowded, even though entrance requirements have been raised, all of which brings about the result that the institution is attempting to give instruction to many more students that it is designed to accommodate.

It is gratifying to note the evident fact that the college is furnishing training for many who would be unable to benefit by this study and work excepting through this institution.

Practically all of the equipment is overworked, and even in the fundamental requirement for ground for experimental and demonstration work there is insufficient land. This is a particularly unfortunate condition, for land, to properly serve, must be brought into and maintained in a condition definitely known, practically impossible where land is rented as at present and is not under entire control of the college. The situation definitely warrants early purchase of further land suitable and available for actual demonstration work. (Some seventy acres are at present hired.)

The Board of Visitors in considering the need of further accommodations is of the opinion that a building adapted for work with agricultural classes and for home economics

courses will best help to permit the college to give the useful training desired, of most value, and where it is now prevented from so doing on account of absolute lack of facilities. The building proposed would in a measure help to allow improvements in some existing arrangements which are definitely objectionable.

The Board urges that early consideration be given to providing a building for the sole use of a women's dormitory. While Davis Hall in many particulars furnishes suitable accommodations, its partial use throughout the lower floors by administration and other offices prevents its best serving as a dormitory for the women students.

The sanitary and bathing facilities which need improvements can only be expensively made with the use of the building as at present.

The library, now comprising some 16,000 volumes, is located in two rooms over the Power Plant and Mechanical Laboratory. A modern building designed to meet the requirements for a safe, quiet and work-a-day library is well warranted by the importance of this vital feature.

We append a statement covering special investigation by two members, one of whom by absence is unable to participate in this preliminary report.

FRANK L. PIERCE, *Vice-Chairman*
RICHARD S. ALDRICH
ELIZA H. L. BARKER
JOHN FLETCHER
GEORGE K. TINKHAM
D. E. CAMPBELL

Providence, R. I., January 26, 1917.

APPENDIX

Special Investigation by Eliza H. L. Barker and Caroline Hazard, Chairman.

The situation at Davis Hall is one that calls for immediate attention. The first floor of the building is entirely occupied by administration offices. It will be remembered that the extension work, by which every farmer in the State can come in touch with the experiment station and can have his land individually prescribed for, has become a most important factor in the work of the college. Fully one-half of the first floor is therefore given over to the administration of the extension department, with the result that both departments are seriously handicapped for lack of space.

The upper part of the building is used for the women's dormitory. Young women therefore have to come and go to their rooms through the public offices. The rooms in which they live are entirely suitable, and better than those furnished to many women students, but the plumbing of the hall is inadequate, and the bathing facilities are discreditable. Detailed information on this point can be given by the two women members of the Board of Visitors.

We therefore heartily concur in the recommendation that a new women's dormitory should be built immediately. This should be built along modern lines, furnishing a proper gathering-place where the women students could receive their men friends. No adequate provision is made in the present arrangement, and the arrangements which exist the women members of the Board of Visitors consider extremely unsuitable.

If a women's dormitory were built it would free Davis Hall immediately for more administration offices and for another very important change.

Visitors to the library will observe the pleasant and studious aspect of the two rooms in which it is housed. They will be

surprised to learn that 16,000 volumes are contained in these two rooms, with only north light. The library rooms are also the reading-rooms, and the immediate prospect is the roof of the power house. When the engine is running, the floor of the library, the desks and tables, shake, and create an atmosphere not conducive to studious repose.

The library ought to be moved immediately, and freeing Davis Hall would give very good accommodations for it. Under the efficient care of the present librarian, it is well systematized and catalogued, and could be made of vastly more use than it is now, with proper reading-room facilities.

CAROLINE HAZARD
ELIZA H. L. BARKER