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Outlook.

With practically every agricultural commodity produced within the State having sold at a price either below or only slightly above the cost of production during the past year the request for assistance from the Extension Service has been greater than ever before, especially in connection with those services which would assist in the reduction of cost of production of crops. From the homemakers, the requests were largely for assistance in reducing the cost of purchased food and clothing.

Entering the new year with very little, if any, improvement in the agricultural situation, we are already being approached with requests for assistance in relation to many problems of agricultural production for the ensuing year. Increased confidence in the extension work is being shown in all lines of agricultural activity. Especially marked is this increased confidence in the case of the commercial vegetable growers.

It is probable that the financial support of our local farm bureaus will be somewhat reduced during the coming year, but not to an extent that will in any marked degree hamper the development of the extension program.

In closing this report, I wish to again express my appreciation for the sympathy with and support of the extension program by all of those who have been requested in any way to assist in its development during the past year.

Respectfully submitted,

G. E. ADAMS,

Director.

Bulletin of Rhode Island State College

VOL. XXIX, NO. 4

FOR FEBRUARY, 1934

REPORT OF THE BOARD OF MANAGERS



KINGSTON, R. I.

1934

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

ENTERED AT KINGSTON, RHODE ISLAND, AS SECOND CLASS MATTER

RHODE ISLAND STATE COLLEGE

RHODE ISLAND STATE COLLEGE
CORPORATION

Term Expires
Jan. 31

WALTER E. RANGER, Pres., Com. of Education, ex-officio, Providence

HARRY R. LEWIS, Com. of Agriculture, ex-officio, East Greenwich...

(Appointed by the Governor with the advice and consent of Senate
for term of five years.)

ZENAS W. BLISS, Vice-President, Providence Co., Providence.....1938

ROBERT S. BURLINGAME, Clerk and Treasurer, Newport Co., New-
port.1936

CHARLES ESTES, Bristol Co., Warren.....1939

THOMAS G. MATHEWSON, Kent Co., East Greenwich.....1935

MRS. L. MOWRY SCHLESINGER, Washington Co., Charlestown....1937

(Appointed by Governor from Alumni Association for term of four years.)

WILLIAM C. CLARKE, 1898, Westerly.....1935

LUCIUS A. WHIPPLE, 1907, Pawtucket.....1937

REPORT

To His Excellency Theodore F. Green, Governor, and the Honorable General Assembly of the State of Rhode Island and Providence Plantations, at its January Session, 1934.

I have the honor to submit herewith the Forty-sixth 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 the Rhode Island State College:

As President of Rhode Island State College I have the honor to submit the annual report.

The year 1933 has witnessed many changes at the college, all of which we hope were for the better. The number of schools in the college were reduced from five to three for administrative purposes, greater responsibilities were placed on the school faculties with a corresponding decentralization of general faculty control, a new scheme of government was set up, a richer opportunity for student selection of courses was provided, the purchasing activities were centralized, campus improvements were advanced rapidly, the odds and ends of our musical program were centered under one director, etc. All in all the year can best be characterized as one in which enthusiasm tempered by conviction in the ultimate greatness of the college prevailed.

The demands for admission continue unabated. The following table covering a period of five years is significant:

Year	Applications	Girls	Boys	Total Freshmen
1929.....	416	50	154	204
1930.....	427	40	179	219
1931.....	591	62	263	325
1932.....	650	93	270	363
1933.....	633	90	220	310 (Attempt made to limit number to 300)

A state college more than any other institution of higher education is keyed to the demands of the average citizen of the State. It is a very narrow view, perhaps I should say a selfish view, for an individual or a group of individuals to look upon a college as solely a place for a few gifted individuals. If only one group of students could be considered for admission to college it should be the ordinary or average one. The brilliant mind is able to make its own way, college or no college. This individual and the dull or lazy student get much of the publicity nowadays, while that great mass

of students of average college ability from whose ranks will continue to be produced the vast majority of people in responsible positions, are passed over with scarcely a comment. The student who does his work well has had few chroniclers. The genius and the dullard are news.

The Rhode Island State College should be in a position to offer its services for every high school graduate of the State of *average* to *superior* mental capacity as demonstrated by high school accomplishments and not be forced, because of a restricted physical plant, to confine its efforts to a selected few. It has no desire whatsoever to ape any other institution. It does desire, though, to provide an education that will promote the welfare of the citizenship of the State of Rhode Island in accordance with the purposes of the Land-Grant Act.

In the address to the graduating class in 1931, I made an effort to state my attitude as to the avenues for expanded service for the college. "On page 17 of the college catalog I read that 'the purpose and work of the Rhode Island State College' as an instructional agency 'is to give college training and culture to young men and young women, not in spite of, but through and with, vocational studies.' This clearly delineates the function of the college from the point of view of its students and pretty largely prescribes the character of studies that shall be taught. The State of Rhode Island has set up this institution to do certain things. Not all students who present themselves for admission, even though they have all the formal requirements, should be admitted. One of our major objectives as administrators and teachers should be to ascertain whether the candidate for admission can profit by the kind of work we offer. The fact that it costs less to attend college at Kingston than it does in Providence is not a true gauge and should not be considered. A few hundred dollars more or less is of no consequence in the consideration of a lifetime occupation. The fact that there is no B. A. degree offered by this college is evidence enough that a certain type of education honored by the centuries is not offered here. Students who desire a liberal education or whose parents desire them to acquire a liberal training should not attempt to secure it at Rhode Island State College; but I do feel, and I feel it emphatically,

that those who desire scientific or technical training with a cultural background can secure it here. I uphold the thesis that culture and the acquiring thereof is a matter of inter-communication of personalities and that the subject matter is of secondary consideration."

Rhode Island State College occupies the unique position of being the only state institution, except for the preparation of teachers, devoted to higher education. At the same time, it suffers the serious and unfortunate handicap of having facilities insufficient for all the qualified young men and women who apply for admission each year. The enrolment for 1933-34 will approximate 1,000 students. The freshman class of 310 was selected from 650 odd applications. It is a difficult task to make a wise selection under any circumstances of potential college students. When this choice must be made under pressure from the public, when literally scores of individuals use every influence from tears to official prestige in an effort to secure admission, the task becomes exceedingly difficult and, at times, unpleasant. The college has tried to be perfectly fair to every candidate for admission. Approximately one hundred of the applicants were not qualified for admission, although they were high school graduates. Another hundred might not have accepted admission had it been offered to them. It is safe to assume that our freshman class would number 400 had admission been granted to every qualified candidate. In this connection it is worthwhile to look at the trends in fiscal support.

Year	Appropriation	Enrolment	Cost to State per Student
1930.....	\$232,690	624	\$373
1931.....	233,070	646	361
1932.....	236,800	814	290
1933.....	233,460	942	248
1934.....	222,500	1,002	222

New Buildings

The opportunity seems to be here for the State of Rhode Island to remedy the deficiencies of the present college plant. In December the State Emergency Public Works Administration approved a building program, which has since been approved by the State Ad-

visory Board of the Federal Emergency Public Works Administration. This, if carried to completion, will enable the college to improve very decidedly the service that it is now rendering to the State and nation. In the preparation of this building program, a sincere effort was made to meet the increasing demands from the public. Nothing was requested that was not needed. Expressions such as: "Your library is not only inadequate but is a monstrosity." "Your dairy barn is the best example in the United States of what a dairy barn should not be." "Your girls' dormitory is not a building where the mothers of this State want their daughters to make their college homes." "There isn't a high school in the State that isn't better equipped for home economics than you are"—are not pleasing to hear. The opportunity, at a minimum ultimate expenditure to the State of Rhode Island, is here to correct the conditions that prompt such criticisms. The following constructions were approved: Home Economics Building, Library and Administration Building, Girls' Dormitory, Power Plant, Cafeteria, Dairy Barn, Remodeling Auditorium, Fire Protection Installation.

The Summer Session

I am very happy to record the inauguration of a six-weeks' summer session from July 5 to August 12. This was the first of what it is hoped will be regular annual summer sessions. While the attendance was not as large as we had hoped for, the enthusiasm of both faculty and students for the session is sufficient justification for a second effort in 1934. The geographic location of Rhode Island State College makes it an ideal place for summer study. Dr. Flaud C. Wooton should be congratulated on his efforts in promoting a permanent school for summer study. The following is his report in detail:

RECEIPTS:

Registration fees	110 @ \$5	\$550.00
Room rent: Davis Hall.....	10 @ 12 = 120.00	
East Hall	7 @ 12 = 84.00	204.00
Laboratory fees		224.50
Tuition (114 students).....		2,460.00
		<hr/>
		\$3,438.50

EXPENDITURES:

Publicity and miscellaneous.....	\$361.42
Salaries.....	3,250.00
	<hr/>
Expenditures.....	\$3,611.42
Receipts.....	\$3,611.42
	<hr/>
Deficit.....	\$172.92

In view of the fact that summer sessions in State universities and land-grant colleges are subsidized by appropriations from State legislatures of from twenty to forty percent of the summer session budgets, and whereas our receipts were entirely from student fees, rents, and tuition, the deficit of less than five percent on our total budget is encouraging.

FACULTY: A faculty of twenty-nine individuals conducted forty-four courses. Five of the faculty were visiting instructors. Two visitors served in the art department, two in the education department, and one in the music department. The excellent financial record indicated in the foregoing paragraphs was made possible by the unselfish cooperation of our resident instructors who served on a sliding scale of remuneration on the basis of enrolment. The general consensus of opinion as to the quality of teaching as gathered by the director of the summer session was highly commendatory.

ENROLMENT: The total enrolment was 126, of which number 118 completed the work of the summer session. The geographical distribution was as follows:

Rhode Island	105	South Carolina	1
Massachusetts	9	Pennsylvania	2
Connecticut	4	Montana	1
West Virginia	1	Illinois	1
New York	1		
District of Columbia.....	1	Total	<hr/> 126

The enrolment by departments was as follows:

Department	No. different students	No. semester credits taught
1. Art	28	46
2. Bacteriology	10	25
3. Botany	9	26
4. Chemistry	15	58
5. Economics	13	33
6. Education	28	100
7. English	12	24
8. French	9	20
9. German	8	16
10. History	7	14
11. Home Economics	7	29
12. Mathematics	12	24
13. Music	9	16
14. Physical Education	7	8
15. Physics	7	36
16. Political Science	4	8
17. Zoology	6	18
	—	—
	191	501

PERSONNEL SUPERVISION: Miss Edith Andrews, of the Home Economics Department, acted as dean of women; and Dr. John C. Weldin, of the Bacteriology Department and Dean of Freshmen, acted as dean of men. Through their efforts the morale of the summer session was kept at a high level. Their specific contributions consisted of arrangement of lawn parties and picnics on the campus and at Thirty-acre pond. The work of these two administrative officers was an important factor in the success of the summer session.

ASSEMBLIES: The weekly assembly in Edwards Hall provided a unifying and cultural influence of great value. Programs consisted of music-vocal and instrumental, under the direction of Mr. Lee McCauley, visiting instructor in music, assisted by student and faculty instrumentalists and vocalists; and of public addresses given by President Bressler, Dr. Ogan, Professor Towne, Professor Cross, and Dean Peck. Mr. Lucius Whipple, member of the Board of Managers and an alumnus of the college, addressed the closing assembly.

VESPER SERVICES: One of the most delightful features of the summer session was the series of vesper services in the Village Church, under the direction of Mr. McCauley. The programs consisted of organ numbers and vocal and instrumental music. The contribution of Miss Julia Stacy Gould to these programs was especially appreciated. The eleven services were rendered on Tuesday and Thursday afternoons. In the closing week of the summer session the village church choir, assisted by summer session students and faculty, presented a model church service evensong.

RECREATION: Facilities were offered during the summer session for swimming at Narragansett Pier and Thirty-acre pond, for golf at the Meadowbrook Golf Club, and for tennis on the campus courts.

Personnel

The following teachers were added to the faculty:

Captain Richard Mathew Sandusky was appointed associate professor of military science.

Captain Sandusky was graduated from the Infantry School in 1922 and from the Command and General Staff School in 1923. He was on the General Staff Eligible List. From 1922 until 1926 he was instructor at the Infantry School. He has taken extension work in journalism at the University of California.

Miss Dorothy Gatton was appointed assistant professor of home economics.

After securing her bachelor's degree at the University of Washington in 1925, Miss Gatton had charge of fine arts and clothing and textiles at Paso Robles, California. She was instructor in the summer session in 1926 at the University of Washington and at Iowa State College for the years 1930 and 1931. She also has had commercial experience as costume and fabric consultant in a large department store and as director of the educational departments of the Rayon Institute and the Celanese Corporation. During 1932 Miss Gatton carried on graduate work at the University of Washington and secured the degree of master of arts in June, 1933, hav-

ing majored in textiles and minored in interior decoration. She has lectured to educational and commercial groups throughout the country—The New York Home Economics Association, The Pacific Arts' Association, The Ohio Retail Merchants' Association and The Southern Retail Merchants' Association. Miss Gatton has lectured for Farm and Home Week in Iowa, New Hampshire, Virginia, and Massachusetts; and she has spoken to 4-H Club groups in Illinois, Massachusetts, New Hampshire, Iowa, and Virginia.

Mr. Lee Charles McCauley was appointed instructor in music.

Mr. McCauley attended Northwestern University (School of Music); Cincinnati College of Music; Teachers' College, Columbia University, summer of 1926; and received the degree of bachelor of public school music from Indiana University in 1929. In Indiana he was supervisor of music in Tipton High School and Elementary Schools; Crawfordsville High School; Bloomington High Schools and Elementary Schools; and Indiana University, summers of 1921 and 1926. Mr. McCauley has supervised music in North Carolina, Illinois, and South Carolina High Schools. Throughout his teaching experience he has been the organist for various churches and has privately taught piano and organ. He is a member of National Music Supervisors Conference, Southern Conference for Music Education, State Committee on Certification of Music Supervision in South Carolina, etc. He has had excellent success in State music contests in Indiana, Illinois, and North Carolina. In the South Carolina State Music Contest in 1933, Mr. McCauley won six firsts, three seconds, and one third place.

Mrs. Alice Tower McCauley was appointed part time instructor in home economics and English.

Mrs. McCauley was graduated from Indiana University in 1923 with an A. B. degree in home economics and with special work in art and psychology. She was elected to Pi Lambda Theta, women's honorary education sorority; and Omicron Nu, honorary home economics sorority. Mrs. McCauley has taught home economics in the Sanborn High School and Bloomington High School, Indiana; in Jane Addams School, Cleveland, Ohio; in Greenville Junior High

School, South Carolina; and has taught home economics and art at Indiana University summer session, 1927 and 1929.

Mr. Leon C. Breault was appointed as Assistant in the School of Engineering.

Mr. Breault is a graduate of Rhode Island State College, having received the degree of B. S. in Electrical Engineering in 1932. During the year 1932-33 he pursued graduate study in mathematics and education at Rhode Island State College and was awarded the master's degree in June, 1933. His teaching experience previous to his present appointment comprises the conduct of a class in freshman mathematics, which work was done in conjunction with his study for his M. S. He was elected to the honor society of Phi Kappa Phi on the basis of his undergraduate work.

Miss Hortense A. Anderson was appointed assistant librarian.

Miss Anderson was graduated from Simmons College with a B. S. degree in library science in 1933. She has worked in the Brookline Public Library, Brookline, Massachusetts; the Public Library in Cotuit, Massachusetts; and has assisted at the Baker Memorial Library of Dartmouth College. While a student at Simmons she was a member of the student government organization, of the Dormitory Board and Dormitory Council, of the Simmons Musical Association, of the Simmons Athletic Association, and was on the staff of the *Simmons News*. She is a member of the American Library Association.

Two resignations were received by the college: *Captain Ulmont William Holly*, Professor of Military Science and Tactics; and *Miss Eunice Jenkins*, Instructor in Home Economics.

The following changes of titles for personnel were approved August 8, 1933:

	Old Title	New Title
George E. Adams	Dean and Director of Extension	Dean of Agriculture and Home Economics, Director of Extension Service, and Director of Experiment Station
Basil E. Gilbert	Director of Experiment Station	Vice-Dean and Director of Research, Head of Department of Agricultural Science
Margaret Whittemore	Dean of Home Economics	Vice-Dean and Professor of Home Economics

	<i>Old Title</i>	<i>New Title</i>
Roger B. Corbett	Research Professor	Head of Departments of Economics and Agricultural Economics and Professor of Economics
Theodore E. Odland	Research Professor	Head of Department of Plant Industry and Professor of Agronomy
Homer O. Stuart	Professor of Poultry Husbandry	Head of Department of Animal Industry and Professor of Poultry Husbandry
L. Edith Andrews	Professor of Home Economics	Associate Professor of Home Economics
Lorenzo F. Kinney, Jr.	Extension Professor	Associate Extension Professor of Agriculture in charge of 4-H Club Work
John B. Smith	Research Professor	Associate Research Professor of Agricultural Chemistry
Sara E. Coyne	Extension Professor of Home Economics	Assistant Professor of Extension Home Economics in charge of Home Demonstration Work
Waldo L. Adams	Associate Professor	Assistant Research Professor of Agricultural Chemistry
Everett P. Christopher	Instructor	Assistant Professor of Horticulture
Frank S. Schlenker	Assistant Professor	Research Instructor in Agricultural Chemistry
Blanche M. Kuschke	Assistant Research Professor of Home Economics	Research Instructor in Home Economics
Donald R. Willard	Assistant Research Professor	Research Instructor in Agricultural Chemistry
French M. Hyre	Assistant Professor	Instructor in Agricultural Economics
Harold C. Knoblauch	Assistant	Instructor in Agronomy
Frank W. Keaney	Director of Physical Education	Director of Athletics and Professor of Physical Education
Andrew J. Newman	Dean of Business Administration	Professor of Economics and Director of Placement Service
John C. Weldin	Professor of Bacteriology	Vice-Dean of Freshmen and Professor of Bacteriology
Lester E. Erwin	Assistant Professor	Instructor in Bacteriology
H. Alida Birch	Librarian	Curator of Libraries
Margaret Van Ingen	Assistant Librarian	Librarian

Research Council

An institution with a formal organization for conducting research along specific lines, as the Rhode Island State College in its Agricultural Experiment Station, e.g., is likely to pass over with little comment the research activities carried on by members of the teaching or extension staffs. The president had a feeling that many valuable contributions might be made to science and education by our personnel if some slight encouragement could be given by the administration. With this in mind he appointed a Research Council consisting of Dr. Gilbert, chairman; Dr. Churchill, recording secretary; Dr. Parks, Dr. Corbett, Dr. Wooton, Dr. Browning, Dr.

Howard, and Mr. Rockafellow from Science and Business; Dr. Odland, Miss Whittemore, and Miss Gatton from Agriculture and Home Economics; and Professor Anderson and Dr. Alexander from Engineering,—with the President and the Deans of Schools as ex-officio members.

The major purposes were suggested in a communication to the Council at its first meeting. I quote from the letter; "Among other things, I shall expect this Council to examine critically all projects of research undertaken by the various schools of the college, to be alert for new problems that our college might reasonably be expected to study, to encourage and stimulate research on the part of our faculty, and in general, to suggest methods of strengthening the entire program of the institution. I have great hopes for this Council. There is much that you can do by way of properly coordinating our work and securing further cooperation among the personnel of the various schools in problems of mutual interest."

A survey of the research activities of the college personnel, exclusive of the Experiment Station, revealed a surprisingly large number and a great variety of fields of research endeavor, chief among which are the following:

Alexander, N. A.—Photoelasticity.

Carleton, R. K.—Investigation of the readjustments that have been made in the personnel of chemistry departments of Land-Grant Colleges with regard to "student-hour loads" and salary decreases.

Christopher, E. P.—Photosynthetic activity of apple leaves under natural conditions.

Churchill, H.—Examination of the western trend of population during the Colonial period of American History as exemplified in certain towns of Massachusetts, Connecticut, and New York.

Churchill, I. L.—William Shenstone's assistance with Bishop Percy's *Reliques of Ancient English Poetry*. Notes on Bishop Percy's Life of Oliver Goldsmith.

Douglass, P. E.—Syllabi of French and Spanish grammar. Study of Spanish Typography of the first quarter of the XVI Century. The democratic spirit in Lope de Vega.

Durham, G. B.—Propagation of evergreens under different temperature conditions at different times of the year. Transparent wraps for flowers for

- shipping and storage conditions. Heredity of flavor in rutabagas. Cytological and morphological study of sterility in tomatoes.
- Howard, F. L.—Studies on Myxomycetes: Food relationships, cytology, and life histories.
- Ince, J. W.—Construction of standardized test for use in organic chemistry. Construction of standardized tests for the high school chemistry contest.
- Jillson, H.—Biography of Maria White Lowell, American poet.
- Jones, J. R.—English trade in Scandanavian Countries, 1603-49.
- Kinney, L. F., Jr.—Studies of certain results, causes, and relationships in 4-H Club work over a period of years.
- Newman, A. J.—Study of methods of placement in use at other colleges.
- Parks, W. G.—The partial and integral heats of dilution of cadmium sulfate solutions from electromotive force measurements. The determination of general thermodynamic quantities of solutions of electrolytes by means of electromotive force measurements.
- Prebluda, H. J.—Synthesis of new organic vanadium derivatives. New Type tests in organic chemistry.
- Rockafellow, R.—The collection of local taxes in Rhode Island.
- Stillman, E.—Preparation of lobster from the institutional viewpoint.
- Webster, S. H.—Construction of a relief map of Rhode Island.
- Wooton, F. C.—Educational contributions of Madam de Maintenon. Relationship of High School scholarship, psychological and English test scores to college performance at Rhode Island State College. Study of distribution of marks at Rhode Island State College. Study of Sophomore tests (Co-operative Test Service) at Rhode Island State College.
- Wright, K. E.—Causes and methods of correction of inhibited metabolic conditions in the table beet.

Addresses to Scientific Organizations

It is difficult to convey an idea of the vast service that the college is rendering to the public off the campus. Reports from the Deans indicate that more than a thousand addresses e.g. have been made during the year by members of the college staff. The major portion of this number has been in regular agricultural extension or research channels. (For an account of these services see report of the Dean and Director on pages 52-94). The following is a partial list of subjects presented to professional and scientific societies.

- Carleton, R. K.—“The Personal Equation in Chemical Analysis.” Paper presented before the Southern Section of the New England Association of

- Chemistry teachers. Published in full in the Journal of Chemical Education.
- “Dr. Charles W. Eliot—Educator, Chemist.” Published in Peabody Alumni Journal.
- Christopher, E. P.—“The assimilation of carbon dioxide in apple leaves as affected by the rate of air flow.” Presented before Joint Session of American Society of Plant Physiologists and American Society of Horticultural Science.
- “The assimilation of carbon dioxide by leaves on different sides of Baldwin apple trees.” Presented before American Society of Horticultural Science.
- Corbett, R. B.—“The economic problems of the dairy farmer.” Presented before the New England Institute on Rural Electrification.
- “Coöperation among vegetable growers around Providence.” Presented before the New England Institute of Coöperation.
- “Economic Planning and the outlook for apples.” Presented at Annual Meeting of the New England Research Council.
- “What next in coöperative marketing in New England?” Presented at Annual Meeting of the New England Research Council.
- Crandall, F. K. and Erwin, L. E.—“Seed treatment studies of spinach.” Presented before American Phytopathological Society.
- Gilbert, B. E.—“Nitrogen carriers in relation to plant growth.” Presented before Section O, American Association for the Advancement of Science.
- Howard, F. L.—“Myxomycete spores as food for the beetle, *Cartodere filum* Aube.”
- “The myxomycetes (motion pictures).” Presented before the Mycological Society of America group of the American Association for the Advancement of Science.
- North, H. F. A. and Erwin, L. E.—“Susceptibility of treated and untreated turf to brown patch.”
- Odland, T. E. and Crandall, F. K.—“Response of early cabbage to manures and fertilizers.” Presented before American Society of Horticultural Science.
- Odland, T. E. and Knoblauch, H. C.—“The response of potatoes to magnesium under various soil conditions.” Presented before Potato Association of America.
- Parks, W. G.—“Constructive Qualitative Analysis.” Presented before the meeting of the New England Association of Chemistry Teachers. Published in the report of the society.
- “An Adjustable Temperature Regulator.” Industrial and Engineering Chemistry, Analytical Edition, September, 1933.
- “The Partial and Integral Heats of Dilution of Aqueous CdSO₄ Solutions from Electromotive Force Measurements.” Presented at the meeting of the American Chemical Society.
- “The Partial and Integral Heats of Dilution of Cadmium Sulfate Solutions

from Electromotive Force Measurements." In collaboration with Victor K. LaMer. Published in the Journal of the American Chemical Society. "The Temperature Coefficients of the Electromotive Force of the Cell Cd (metal), CdSO₄, Cd (sat. amalgam)." In collaboration with Victor K. LaMer. Published in the Journal of the American Chemical Society.

Smith, J. B.—"The effect of nitrate and ammonium nitrogen on the relationships among certain nitrogen fractions in the juice of beet leaves." Presented before American Society of Plant Physiologists.

Stene, A. E.—"Some preliminary studies in the fertilization of red raspberries." Presented before American Society of Horticultural Science.

Stuart, H. C.—"What an Egg Laying Contest Shows." Norfolk County Poultry Association.

"Feeding Practice." Rehoboth Poultry Association.

"Judging Baby Chicks." Connecticut Baby Chick and Egg Show at Hartford.

"New Developments in Incubation." Series of three lectures at annual meeting of New Hampshire Poultry Growers Association.

Tennant, J. L.—"Economic planning and outlook for cow numbers and prices." Presented at Annual Meeting of the New England Research Council.

"The cost of producing milk and milk price control in the northeastern states." Presented at the World's Grain Conference and Exhibition, Regina, Saskatchewan.

New Plan of Grading Students

One of the significant accomplishments from the viewpoint of administration of this year was the complete revision of the method of evaluating student grades and the changes in procedure for dismissal of delinquent students. The result of these changes, which are reported below, will, it is believed, have certain advantages. The standard for graduation will be raised from an average of sixty to approximately seventy. This will not prevent any student with fair ability and application from being graduated, but it will hold back those who barely are able to pass the required work. The new system also has the advantages of simplicity, convenience, and economy for the instructional staff and administrative offices in reporting and recording grades. The literal system, since it divides the students into only five groups instead of 41, may be expected to be more accurate. A better opportunity is afforded, also, for securing uniformity in distribution of grades. And lastly, the cumulative rec-

ords of quality points enable the student to determine at any time whether he is making normal progress toward graduation or not.

The essential details of the new system are as follows:

GRADES AND POINTS: All student grades are to be reported as A, B, C, D, E, or F. These marks indicate the following groups of students: A, superior student; B, good student—above average but not superior; C, average student; D, low grade student—below average but passing; E, failure which may be removed by examination; F, failure, course must be repeated. These grades are each given "quality point" values: A, 3 points; B, 2 points; C, 1 point; D, 0 points; E or F,—1 point. It will be noted that the E and F grades have the same value. The only advantage in the use of the two letters is that they indicate to the registrar the manner by which the failure may be removed.

GRADUATION: To be graduated a student must have quality points equivalent to the number of credits required in his curriculum and must have passed all the required subjects in said curriculum. This does not mean that he must have a C grade in each subject; it means that his *average* must be equivalent to at least a C grade. A maximum of ten full semesters in one curriculum is allowed any student for graduation, although this limit may be extended by action of the administrative council and ratification by the faculty.

PROBATION: Probation is a term used to express the status of students who, in the preceding report period, have done unsatisfactory work, but for whom it is felt there is a possibility of their doing work of better quality. The student is placed on probation when he fails one-half the credit hours in which he is registered or when he fails to acquire quality points equivalent to at least one-third of the credits in which a grade is received. Somewhat more lenient regulations govern students who are in their first semester of registration and those who have received low marks because of illness during the report period.

DISMISSAL: Students are to be dismissed from college for low scholarship according to the following procedure: if a student fails two-thirds of the credits in which he is registered for a semester,

or if the total of his quality points for a semester are minus six or below, or if he has been placed on probation four consecutive times or six non-consecutive times—he is notified that he will be dismissed unless he can present extenuating reasons for the condition of his work. He then has the opportunity of appearing before a scholarship committee to present his case. The parents of the students are likewise notified of the impending action and also have the privilege of attending the committee meeting. After the hearing, the Committee may recommend to the President and the Administrative Council that dismissal action be modified or deferred. Failing to receive such recommendation, the Administrative Council takes action of dismissal. After dismissal the student has the privilege of one re-registration after the lapse of one full semester.

This system, as briefly outlined above, was adopted by the faculty at their last meeting in June, 1933, and was put into operation in September for students of the freshman and sophomore classes. The students, even though they realize that the system requires a better grade of work than heretofore, are heartily in approval.

Reorganization

A careful observation of the existing organization of the agricultural and home economics services at the Rhode Island State College over a period of two years pointed to the conclusion that there was a real need for a coordination of all our efforts in these lines so that a unified program might be carried on. There was little or no cooperation between the research staff and the staff in extension and teaching. Theoretically, the teachers and extension agents are supposed to be expounders of scientific facts developed by the Station. Practically this was true only in a very limited way.

The Board of Managers at their August meeting approved a merging of all agricultural and home making interests under one dean and director, with two vice-deans—one of research and the other of home economics—and five departments to include in their respective fields all research, extension, and teaching activities. The new school was designated as the School of Agriculture and Home Economics. It includes the following departments: agricultural

economics, agricultural science, animal industry, plant industry, and home economics.

The merging of Science and Business under one administrative head—Vice-President Barlow—has likewise been completed. The college is now operating under four major divisions: the Executive Offices, the Schools of Agriculture and Home Economics, Engineering, and Science and Business.

Placement Service

Tentative plans for the Placement Service were under way in 1932. These plans were developed further in 1933 so that for the graduating class of 1933 there was a real effort made to assist in securing positions. At a time like the present when apparently there are no opportunities for work too many of us accept the conditions as if they were inevitable and make no effort to change them or to help ourselves. Many of the larger colleges have developed job-finding departments. Rhode Island State College does not have the money to inaugurate an elaborate system of placing its graduates. This fact is no argument for not making an effort.

The plan calls for a 50-50 participation in the cost of the service exclusive of personnel requirements which are carried entirely by the college. Professor A. J. Newman is in charge of the Service. His reports indicate that a very fine contribution has already been made and point the way toward a better service for the future.

Religious Activities

Our student body presents a fair cross section of the heterogeneous population of Rhode Island. The religious census shows that of the 946 undergraduate students, practically all have indicated some religious preference. The largest single group is the Roman Catholic which comprises approximately one-third of the student body. The Jewish group is a substantial one, numbering 74. The protestant students are distributed among a large number of different churches—the largest being the Episcopalian, Baptist, and Congregational groups. The religious situation at our institution is, therefore, very different from that which is found in many of the

colleges and universities of the country. There are no compulsory religious exercises. At our weekly assembly there is usually a devotional exercise directed by the President or, occasionally, by some visiting clergyman.

The local Catholic church conducts Mass in Edwards' Hall each Sunday morning. The rector of the nearest Episcopal church had formerly held services at the college, but these were suspended when the rector resigned due to illness. The new rector has not yet taken up this work, but I am informed that he plans to re-establish these gatherings at a date in the near future. The village church, which is a Congregational church, opens its doors and gives the students a cordial welcome to all services and other activities.

The faculty members from time to time have carried on Bible study groups and other discussion groups which have been loosely organized. The college faculty, although they represent many different denominations, exert an influence which is distinctly religious. We have not had in recent years any member of the faculty who is distinctly anti-religious.

There is, at the present time, no active Y. M. C. A. or Y. W. C. A. The most important organization which has a definite bearing upon the religious life of the students is the Student Fellowship Group in which all sects are welcomed. It is an organization of students devoted to the cultivation of fellowship in the pursuit of the highest interests of life. It stands for absolute freedom of thought and speech in the discussion of vital social, political, economic, and ethical problems.

The Student Fellowship meets on Sunday evenings in the Church House, owned and operated by the Village Church. It is controlled by the students with the aid of the minister of the church and with the cooperation of members of the faculty. The students attempt to give two or three plays of a religious nature during each college year.

During the present year the questions discussed covered a wide range: there have been two philosophical discussions—the philosophy of Jesus, and the place of Aristotle in the history of philosophy; there was one strictly religious discussion—What is the Value of

Religion; there were two discussions on Hitler; and there was a talk given by a native of China regarding the problems of the Far East. The Student Fellowship will soon discuss the question of armament and the challenge offered by the outbreak of lynching.

The deeper accomplishment of the Student Fellowship seems to be the cultivation of mutual respect and understanding between the several racial and religious groups on the campus. Protestants, Jews, and Catholics are included in its membership, and the finest kind of fellowship prevails—notwithstanding the fact that religious questions are frankly discussed.

Debating

The President notes with gratification a revived interest in debating at the Rhode Island State College. During the year the students participated in the following debates:

MEN: Providence College, Providence—A Department of Education should be established with a Secretary in the President's Cabinet.

Providence College, Kingston—War debts should be cancelled.

Rensselaer Polytechnic Institute—War debts should be cancelled.

Rutgers—A Department of Education should be established with a Secretary in the President's Cabinet.

University of Maine—Modern Advertising is detrimental.

WOMEN: University of Buffalo—Capitalism is the cause of war.

Middlebury College—War debts should be cancelled.

Student Government

The Sachems, a name adopted from the old Indian tribal councils, is the student governing body at the college. One of the pressing problems that confronted the president upon his arrival at Rhode Island State College in 1931 was student politics and the relation of student government to the program of the institution. Student elections were in a rather chaotic state. The usual cliques, swaps, combines were in full swing. Deadlocks, ill feeling, and "dirty politics" were common. Late in the year a plan conceived mainly by two alumni of the Class of 1929, Daniel A. O'Connor and William A. Mokray, was submitted to the president. This plan had excellent possibilities for minimizing the undesirable features in stu-

dent control. A committee consisting of faculty, alumni, and undergraduates was appointed. The report of this committee was adopted by the student body and approved by the administration of the college in 1932.

The constitution and by-laws of the organization are given herewith and constitute the fundamental law of student government at the college.

ARTICLE I. NAME

Section 1. The name of this organization shall be the *Sachems*.

ARTICLE II. PURPOSE

Section 1. The purpose of this organization shall be

(A) The establishment of a representative group of members of the student body, chosen by virtue of their proven honor, integrity, and general ability.

(B) The maintenance and enforcement of a high ethical code of student conduct in accordance with the best traditions of Rhode Island State College.

(C) The fostering of free interchange of thought between the faculty and student body at all times.

(D) The adjudication and control of student matters which do not properly belong in the realm of faculty control and the voicing of student opinion in limiting such faculty control.

(E) The conferring of honor upon students whose contributions to the institution have been outstanding.

ARTICLE III. MEMBERSHIP

Section 1. Membership in this organization shall be confined to students and faculty of Rhode Island State College who have been qualified by eligibility and election.

Section 2. The number of regularly initiated members in the ACTIVE group shall not exceed 15, nor shall it exceed one member for each 10 members enrolled in the junior class.

Section 3. The ratio of men to women in the ACTIVE membership shall be the same as the ratio of men to women in the junior class.

ARTICLE IV. CLASSES OF MEMBERSHIP

Section 1. Membership shall be divided into three classes as follows:

(A) The ACTIVE voting membership as elected under the provisions of Article VI of this constitution, in whose hands all the powers of the organization shall be vested.

(B) The RETIRED membership shall be comprised of those duly elected members who have completed a term of active membership and shall form an Honorary Consulting Board without powers or vote.

(C) The FACULTY membership shall consist of two members of the Rhode Island State College faculty who shall have the power to speak and to advise, but who shall be without power to vote.

ARTICLE V. ELIGIBILITY OF MEMBERS

Section 1. Students of Rhode Island State College are eligible for membership under the provisions of this article.

Section 2. No student shall be eligible until he or she shall be in the third year of registration in college. Members shall be elected on the basis of the points collected during their first three years in college.

Section 3. No students shall be eligible for election without having engaged in college activities which carry weight under the provisions of Article VII of this constitution.

ARTICLE VI. SELECTION OF MEMBERS

Section 1. Members of the ACTIVE voting group shall be selected each year by the then existing active group at a meeting which must be held before graduation and when possible on the first Monday after the Junior Prom, to serve for a term of one year.

Section 2. Those eligible students having the highest score of points under the Approved Table of Activity Points (see Article VII) shall automatically be selected as new members of the retiring group.

Section 3. Faculty members shall be selected in the following manner: three candidates shall be nominated by the then existing active group for vacancies as they occur; the President of the Rhode Island State College shall then select the member from the nominees. Faculty members shall be appointed for a term of three years, except when two appointments must be made in the same year; in this case, one shall be for two and one for three years.

ARTICLE VII. APPROVED POINT LIST

Section 1. All elections shall be based on the following scale of points which shall be known as the APPROVED POINT LIST.

FOR MEN:

Points

- 1. Member of football, basketball, track, cross-country or baseball teams, if no letter is made.... 2
- 2. Member of above teams for each year letter is made. 4

- 3. For Captain of football or basketball teams, if 1 captain. 10* —if elected
- For Captain of football or basketball teams, if 2 captains. 8* each—if appointed
- For Captain of football or basketball teams, if 3 or more 6* each—if appointed
- 4. For Captain of track, cross country, or baseball, if 1 captain 7*
- For Captain of track, cross country, or baseball, if 2 captains 6* each
- For Captain of track, cross country, or baseball, if 3 or more. 5* each
- 5. Manager of any varsity sport team. 6
- 6. Manager of any freshman team. 4
- 7. Assisting managers or candidates. 2†
- 8. For membership in intra-mural athletic team. 1
- 9. For member of R. O. T. C. Rifle Team. 2
- 10. For captain of R. O. T. C. Rifle Team. 4*
- 11. For manager of R. O. T. C. Rifle Team. 2
- 12. For member of the Men's Glee Club. 1
- 13. For leader of the Men's Glee Club. 2
- 14. For manager of the Men's Glee Club. 4
- 15. For member of men's student council. 2

FOR WOMEN:

- 16. For member of varsity sport team. 2
- 17. For manager or captain of varsity sport team. 5*
- 18. For letter, won by participation in girls' athletics 2
- 19. For member of coed rifle team. 2
- 20. For membership of women's student council. 1
- 21. For officer of women's student council. 5
- 22. For major role in May Day Pageant. 1
- 23. For member of Women's Glee Club. 1
- 24. For leader of Women's Glee Club. 2*
- 25. For manager of Women's Glee Club. 4

* Total points—include membership with or without letter.

† In order to receive credits for points as candidate for manager of any sport team, the student must be out for the duration of the season.

FOR MEN OR WOMEN:

- 26. For president of any of the following organizations: C. E. Society, E. E. Society, M. E. Society, Home Ec. Society, R. I. Club, Phi Delta, R. I. S. C. Players, Aggie Club, Biological Society, Chemical Society, Rifle Club, and Debating Society 2

- 27. For officer, except president of organizations listed above 1
- 28. For member of the orchestra. 1
- 29. For leader of the orchestra. 2
- 30. For manager of the orchestra. 2
- 31. For officer of any class. 4
- 32. For member of the executive staff of the *Beacon* (Includes editor in chief, business manager, assistant editor, and managing editor) 8
- 33. For department editor or managers of the *Beacon* 4
- 34. For staff members of the *Beacon*. 2
- 35. For editor-in-chief of the *Grist*. 7
- 36. For business manager of the *Grist*. 7
- 37. For advertising manager of the *Grist*. 5
- 38. For staff members of *Grist* except as noted above 2
- 39. For each of the executive members of the Freshman Bible staff. 5
- 40. For scholastic honors, one year only. 4
- 41. For scholastic honors, two years. 9
- 42. For scholastic honors, three years. 15
- 43. For part in any dramatic presentation, front or back stage, points to be given on the recommendation of the faculty coach, suggested maximum number of points. 4
- 44. For chairman of any major dance. 6
- 45. For member of committee, except chairman, of any major dance. 1
- 46. For member of varsity debating team. 6
- 47. For member of team, second debate on same subject. 2
(If same subject is debated more than two times, no points will be given after second debate)
- 48. For manager of debating team. 4
- 49. For member of intra-mural debating team. 3
- 50. For member of freshman banquet committee. 1
- 51. For assistance in any minor undergraduate undertaking (see by-laws) 1

Section 2. The total point record of all candidates shall be compiled in the Office of the College Registrar from the approved point list and totals thus calculated shall be considered official and final except as provided in Sections 3 and 4 of this Article.

Section 3. The Faculty members of this organization shall constitute a Standing Committee for the survey of all activities carrying points. They shall have the right to recommend any activity for any given year. They may recom-

mend that points be withheld entirely for activities which are, or tend to be, moribund.

Section 4. Recommendations made under Section 3 of the Article shall be considered as amendments when changes are permanent and shall be subject to the same voting procedure.

ARTICLE VIII. ELECTIONS

Section 1. Elections shall be held annually at a meeting which must be held before graduation, and when possible, on the first Monday after the Junior Prom.

Section 2. Notice of elections shall be posted in the college buildings and printed in the *Beacon* at least one week before the election is held.

Section 3. The upper 20 percent of students on the basis of points accumulated as checked at the college office will be posted with the notices of elections.

Section 4. Results of elections shall be announced at the first Assembly following the elections, and the new members shall take office immediately.

ARTICLE IX. MEETINGS

Section 1. Regular meetings shall be held semi-monthly, on the first and third Mondays of the month.

Section 2. Special meetings may be called by either of the officers when deemed necessary.

Section 3. Any student organization may demand consideration by this body of a student problem, pertaining to the organization, upon presentation of a petition signed by fifty percent of the members of the organization. Such student problems will be considered by this body, at a regular meeting, unless the petition requests immediate action, in which case a special meeting must be called.

ARTICLE X. QUORUM

Section 1. A quorum shall consist of two-thirds of the membership of this organization.

Section 2. Proxies shall not be voted except by consent of three-quarters of the membership.

ARTICLE XI. RULES OF ORDER

Section 1. Meetings shall be conducted in accordance with Robert's Rules of Order.

ARTICLE XII. OFFICERS

Section 1. The officers of this organization shall consist of a Moderator and a Secretary, both of whom shall be elected at the first regular meeting of the ACTIVE group by the members of this group.

ARTICLE XIII. ELECTION OF OFFICERS

Section 1. The officers shall be elected at a meeting held immediately after the installation of the new ACTIVE group.

Section 2. All officers shall be elected by ballots cast without nominations. The member receiving the greatest number of votes shall assume the office immediately.

Section 3. A separate ballot shall be cast for each office.

ARTICLE XIV. DUTIES AND POWERS OF OFFICERS

Section 1. The Moderator shall preside at all meetings of this organization except that in his absence the Secretary shall preside.

Section 2. The Moderator shall represent the organization at all times, shall present its policies, and shall enforce its rulings.

Section 3. The Secretary shall keep all records of the organization, shall preside in the absence of the Moderator, shall faithfully publish all announcements, and shall be responsible for the observance of this constitution.

Section 4. The Secretary shall keep on file in the college library a complete copy of this constitution at all times, available on demand of any member of the student body. He shall promptly file copies of all amendments thereto, and shall see that this public copy is the one actually in force.

Section 5. The Secretary shall also keep on file an authentic copy of the constitution in the office of the College Registrar; this copy is not to be removed by any officer or any member at any time.

Section 6. The Secretary shall see that all business of this organization is carried on in accordance with the provisions of the constitution as embodied in the copy mentioned in Section 5 of this Article. This copy shall be considered as the final authority in case of dissension.

ARTICLE XV. AMENDMENTS

Section 1. Amendments to this constitution may be made at a regular meeting of the organization by a vote of four-fifths of the members providing such amendment has been formally presented for consideration at the last regular meeting.

The Sachems had scarcely got under way in 1933 before their constitutional authority was challenged on the grounds of their control of class elections. A committee comprised of two faculty members, an alumnus, and three undergraduates was named by the President of the College to consider the question and to render a report to him. After hearing opinions of many persons, both favorable and opposed to the control by the Sachems, a decision

was rendered to the effect that the constitution gave the Sachems control over class elections.

In the spring the Sachems carefully considered the point ratings given to all college activities as a basis for election to that body. The point value of nearly every activity was adjusted so that a better balanced rating was obtained.

At the opening of college in the fall a rally for the freshmen and an informal dance were run by the Sachems. During the second week of college class elections were held; the results this year seemed to give satisfaction. After considerable discussion the freshman rules were shortened and the time during which they were to be effective was reduced to the first semester.

The latest problem undertaken by the Sachems is that of the control of expenditures for the Sophomore Hop and the Junior Prom. A budget was made for the Sophomore Hop and an effort made to keep the expenditures within the receipts and within reasonable financial limits.

The president has great respect for this organization and believes that it has an opportunity to contribute constructively to the welfare of the college.

Dad's Day

In January there was held at the college the first annual meeting of the Dads of the college students. Numerous letters have been received since that meeting which indicated that there was a real appreciation on the part of the parents for the courtesy extended them by the college in inviting them to see their children at work and at play, to visit the college buildings, and to get somewhat acquainted with the college teachers. The program consisted of musical and dramatic entertainment in Edwards Hall in the afternoon, tours of the several buildings of the college from 4 p. m. until 6 p. m., and a banquet and a basketball game at night. There were 307 Dads who sat down to the banquet at Lippitt Hall at night. A permanent organization was formed, the officers of which were the following: Mayor James E. Dunne, Providence, President; Robert Burnett, Westerly, Vice-President; F. C. Wooton, Kingston,

Secretary-Treasurer. These officers with the president of the college constitute the Executive Committee of the Association.

Host to Visiting Organizations

During the year the college has been host to numerous organizations and societies. The chief conference during the summer perhaps was that of the New England Grange Lecturers. More than a thousand people visited the college during that week. The following resolutions passed by the Rhode Island State Grange expressed clearly their attitude concerning the college participation in the conference: "*Whereas* the 1933 Session of New England Lecturers' Conference held at Kingston the past summer, was admittedly one of the finest, if not the best, in its history, and *Whereas* no inconsiderable part of the credit for this session is directly due to the hospitality of our State College, be it therefore resolved: That the Rhode Island State Grange, in appreciation of the splendid cooperation of the faculty and all others connected with the college, hereby expresses its thanks to President Bressler and the College."

Other groups which met at the college were the first Annual Mid-Winter 4-H Club meeting, the Second Annual Institute on Rural Electrification, the annual meeting of Rhode Island Potato Growers, the tenth annual meeting of Rhode Island Highway Association, the fourth annual meeting of Rhode Island Greenkeepers Club, the fifth annual Camp Coyne, the eleventh annual Camp Edwards, the joint meeting of the Rhode Island Lions Clubs, the meeting of South Kingstown Lions Club, the Rhode Island Chapter of the National Association of Power Engineers, and the National Conference of Jews and Christians.

Western Union

The Western Union Telegraph Company in October entered into an agreement with the college whereby they were given permission to establish a telegraph office on the college campus. This office is located in the Co-op store. Considerable use has already been made of the service extended. It is a real convenience to have this service on the campus. Judging by the use that has already been

made, the college was justified in allowing the office to be opened. A very marked increase in the number of inches in newspaper material that appeared in the public press concerning the activities of the college is partially due to this service.

Sewer and Water Lines

The 1933 legislature made a special appropriation of \$4,100 for an extension of a sewer line which would connect all of the college buildings, including fraternities and sororities, and the digging of a test well in the vicinity of 30-Acre pond with a view of finding a permanent source of water for the college. This sewer line has been constructed, and the test well dug. The college has been fortunate in striking what appears to be a main water vein. At a depth of 18 feet the well flowed 250 gallons a minute and came from the land side rather than the lake, which indicates that one of the springs feeding this lake has been tapped. The college is awaiting an appropriation now of approximately \$6,000 to construct a water line from this well to the water tank, after which there should be no further worries about an adequate supply of water for the college.

The Board of Managers early in the summer approved a project permitting the village to connect with the college line at the college gates, without any cost to the college and for fire protection purposes only.

New Construction

The new athletic Field House is a brick structure, 80 feet by 40 feet. It contains a main locker room, two locker rooms for the varsity and visiting teams, an office for the coaches, and a dressing room for officials. At the entrance there is an equipment room where the boys may change equipment, get clean towels, etc. The furnace room is in the basement. In the centre of the building there are adequate showers and toilet facilities, and men's and women's comfort rooms for the public.

The structure is old colonial. With its tower and ram and football atop, as a weather vane, it makes a pleasing appearance from the top of the hill.

The cost of the building was slightly more than \$10,000. The funds came from miscellaneous income of the college, savings from the blanket tax for the past two years, and income from athletic events.

Back of the sorority houses there has been completed a grass track for women—20 feet wide and 120 yards long—and a grass plot 120 feet by 60 feet for volleyball, basketball, and playground ball. The fertilizer treatment and seeding of these plots have been in accordance with the recommendation of the Experiment Station and should give us valuable data during the next few years on methods of producing greens for playing fields. There also has been laid the foundation for three tennis courts. When money becomes available, these will be leveled with concrete or macadam.

Back of the new field house a new football practice field is being developed, and an intra-mural field on the South Campus is practically completed. An interesting feature in this field is the small twenty-one plot section 30 x 70 feet. Each plot is treated differently, with a view of ascertaining the best methods of developing turfs for football fields. The rest of the field, 180 x 320, is seeded in accordance with present facts as ascertained by the Experiment Station.

For many years the campus lights were suspended from limbs on trees, light poles, and corners of buildings. It is always a mistake to run light wires on trees. The good intention of taking them down before any damage is done to the trees always remains a good intention. The situation was remedied during the past year by erecting 12 fourteen-foot concrete poles on the campus. They were secured from the State Institution at Howard and add much to the attractiveness of the campus.

Respectfully submitted,

RAYMOND G. BRESSLER,

President.

January 25, 1934.

TABLE NO. 1
Report of the Registrar
Attendance

Showing attendance by Classes during years 1929-1933

CLASS	1929-30	1930-31	1931-32	1932-33	1933-34
Graduate.	1	2	7	21	32
Senior.	98	97	127	121	135
Junior.	110	152	147	165	207
Sophomore.	201	162	184	239	294
Freshman.	206	217	319	366	310
Irregular.	6	15	13	11	24
Total.	622	645	797	923	1,002

TABLE NO. 2

Showing number of Men and Women and of New and Previous Matriculates, by Classes for Collegiate Year 1933-1934

CLASS	Sex		Date of Matriculation	
	Men	Women	Previous to 1933	1933
Graduate.	21	11	25	7
Senior.	102	33	135	0
Junior.	168	39	207	0
Sophomore.	211	83	290	4
Freshman.	220	90	300	10
Irregular.	10	14	8	16
	732	270	965	37

TABLE NO 3
Showing Distribution of Students in Curricula Leading to
B. S. Degree during 1933-1934

CLASS	Agri.		Engineering						Sci.		Home Ec.	Bus. Ad.		Phys. Ed.	Total	
			Civil	Chem.	Elec.	Mech.	Total									
	M	W.	M.	M.	M.	M.	W.	M.	W.	M.	W.	M.	W.	M.	M. & W.	
Senior	3	1	12	9	8	17	..	46	..	31	8	21	22	3	..	135
Junior	10	0	22	7	27	17	..	73	..	46	5	24	39	10	..	207
Sophomore	19	1	20	18	11	23	1	72	1	56	21	44	52	16	12	294
Freshman	27	1	..	..	..	..	..	83	..	58	15	60	48	14	4	310
	59	3	54	34	46	57	1	274	1	191	49	149	161	43	16	946

Home Residence of Students Enrolled in
Four-Year Courses

A. Resident outside of the State:

Connecticut:

Groton	2
Naugatuck	1
New Haven	2
New London	1
Norwich	1
Old Saybrook	5
Poquonock Bridge	1
Stonington	4
Wallingford	1
	18

Iowa:

Alta	1
	1

Maine:

North Waterford	2
Portland	1
South Portland	2
	5

Massachusetts:

Agawam	1
Amesbury	1
Attleboro	2
Auburndale	1
Brockton	7
Chicopee	2
Dorchester	2
Fall River	14
Foxboro	1
Gardner	1
Holyoke	2
Hopkinton	1
Lancaster	1
Lawrence	1
Mattapan	1
Melrose	1
Middleboro	1
New Bedford	3
Newton Highlands	1
Newtonville	1
North Attleboro	4

Massachusetts (Continued):		New York:	
Palmer	1	Amsterdam	1
Provincetown	2	Long Island City.....	1
Rehoboth	1	Morris	1
Seekonk	1	Seneca Falls	1
Southbridge	1		
Springfield	2		4
Taunton	3	Pennsylvania:	
Templeton	1	Drexel Heights	1
Watertown	1	Hazleton	1
Webster	1	Pittston	1
Willimansett	2	Wilkes-Barre	1
Worcester	1		
	<hr/>		4
	66	Spain:	
New Jersey:		Barcelona	1
Clifton	1		1
Elizabeth	1	West Virginia:	
Hamburg	1	Berkeley Springs	1
Long Branch	1	Pine Grove	1
Passaic	1		
Roselle Park	2		2
	<hr/>		
	7		

B. Resident in Rhode Island by Counties and Towns:

Bristol:		New Shoreham		1
Barrington	6	Portsmouth	2	
Bristol	9	Tiverton	1	
Warren	8			70
	<hr/>	Providence:		
	23	Burrillville	4	
Kent:		Central Falls	10	
Coventry	4	Cranston	90	
East Greenwich	20	Cumberland	5	
Warwick	19	East Providence	41	
West Warwick	15	Glocester	4	
	<hr/>	Johnston	8	
	58	Lincoln	8	
Newport:		North Providence	8	
Jamestown	4	Pawtucket	45	
Middletown	2	Providence	273	
Newport	60			

Providence (Continued):		Narragansett		9
Scituate	2	North Kingstown	13	
Smithfield	2	Richmond	9	
Woonsocket	37	South Kingstown	47	
	<hr/>	Westerly	66	
	537	Washington:		
Washington:		Hopkinton	6	150
Total Attendance from within the State.....				838
Total Attendance from outside the State.....				108

Preparatory Schools Represented in Freshman Class

In Rhode Island:		New Milford High.....		1
Barrington High	3	Norwich—Free Academy	1	
Bristol:		Saybrook—Old Saybrook High	1	
Colt Memorial High.....	2	Poquonock Bridge—R. E. Fitch High.	1	
Central Falls High.....	1	Stonington High	1	
Cranston High	15	Wallingford—Lyman Hall High	1	
Cumberland High	3	In Maine:		
East Greenwich Academy.....	2	Brunswick High	1	
East Providence High.....	10	South Portland High.....	1	
Newport:		In Massachusetts:		
Rogers High	16	Boston—English High	1	
North Kingstown High.....	5	Brockton High	1	
Pawtucket High	17	Fall River—B. M. C. Durfee High.	5	
Providence:		Franklin—Dean Academy	2	
Central High	50	Holyoke High	1	
Classical High	17	New Bedford High.....	1	
Hope Street High.....	22	Newton High	3	
La Salle Academy.....	10	Norwood High	2	
Moses Brown	1	South Byfield—Gov. Dummer Academy.	1	
St. Mary's Seminary.....	2	Taunton High	1	
St. Xavier's Academy.....	10	Winthrop High	1	
South Kingstown High.....	18	In New Hampshire:		
Warren High	1	New Hampton School.....	1	
Warwick High	10	In New Jersey:		
Westerly High	23	Long Branch High.....	1	
West Warwick High.....	6	Passaic High	1	
Woonsocket High	11	Pennington High	1	
	<hr/>	Roselle Park High.....	1	
	255	In Connecticut:		
In Connecticut:		Bridgeport—Warren Harding..	1	

In New York:		In West Virginia:	
Brooklyn Preparatory	1	Berkeley Springs High.....	1
New York City—Eron Preparatory.	1	Total outside of Rhode Island...	36

Total number of students received from high school.....	291
Total number of students re-classified and repeating work.....	10
Total number of students transferred from other colleges.....	9
Total number of students classified as Freshmen.....	310
Average age of men and women, Oct. 1, 1933.....	18 years, 10 months, 14 days
Age of oldest member of class, Oct. 1, 1933.....	28 years, 4 months, 10 days
Age of youngest member of class, Oct. 1, 1933.....	15 years, 10 months, 17 days

REPORT OF THE TREASURER

R. S. BURLINGAME, Treasurer, in account with the different funds of Rhode Island State College for year ended June 30, 1933

EXPENDITURES JULY 1, 1932, TO JUNE 30, 1933

	State	Current	Trust	Morrill 1890	Morrill 1862	Capper Ketcham	Smith Lever	Totals
Salaries.....	\$127,304.05	\$5,667.23	\$3,390.00	\$50,000.00	\$2,500.00	\$20,470.56	\$9,377.00	\$218,708.84
Labor.....	42,045.95	10,314.86	10,630.72					62,991.53
Special Services.....	110.00	753.59	31.50					895.09
Postage.....		1,927.93					105.92	2,033.85
Telephone and Telegraph.....		1,639.25						1,639.25
Office Supplies.....		1,679.73	4.03			1.57		3,126.85
Subscriptions.....		811.65						811.65
Printing and Binding.....		4,879.49					359.55	5,239.04
Advertising.....		100.30						100.30
Traveling.....		3,676.61	551.59				2,112.51	6,340.71
Food.....			34,495.21					34,495.21
Forage.....		4,132.65						4,132.65
Fuel.....	22,510.65	304.95	418.52					23,234.12
Light, Power, etc.....		7,242.89						7,242.89
Motor Vehicle Expense.....		1,547.45						1,547.45
Medical and Surgical.....		633.36						633.36
Laundry and Sanitary.....		1,762.52	1,539.14					3,301.66
Educational Supplies.....	5,489.35	12,032.31						17,521.66
Recreational Expense.....		2,036.75						2,036.75
Agricultural and Botanical.....		1,770.28						1,770.28
Miscellaneous.....		3,304.44	21,530.18					24,834.62
Rental.....	3,500.00	821.92					7.50	4,329.42
Freight and Express.....		1,316.82	437.91					1,754.73
Refunds.....		2,055.42						2,055.42
Uncollectable Accounts.....		137.47	470.75					608.22

	State	Current	Trust	Morrill 1890	Morrill 1862	Capper Ketcham	Smith Lever	Totals
Transferred to Fraternity Funds.....		820.00						820.00
Interest on Federal Funds.....		8.85						8.85
Repair Labor	6,747.08	1,849.82	88.27					8,685.17
Repair Materials	7,824.72	2,751.99	71.66				81.15	10,729.52
Repair Contracts	587.67	50.00						637.67
Replacements.	9,840.53	313.88						10,154.41
Equipment.	7,500.00	15,689.25	478.36			9.70	481.35	24,158.66
Permanent Improvements		5,088.81						5,088.81
Special State Appropriation								
New Sewer	1,005.63							1,005.63
New Sewer	\$1,005.63							
Total State Maintenance.....	\$233,460.00	\$97,122.47	\$74,137.84	\$50,000.00	\$2,500.00	\$20,481.83	\$13,966.50	\$492,674.27

RECEIPTS JULY 1, 1932, TO JUNE 30, 1933

	Reserve	State	Current	Trust	Morrill 1890	Morrill 1862	Capper Ketcham	Smith Lever	Totals
Balance brought forward.....	\$4,000.00		\$4,504.67	\$4,514.78					\$13,019.46
Federal Appropriation					\$50,000.00		\$20,481.83	\$14,432.82	84,914.65
Interest for year.....						\$2,500.00			2,500.00
State Appropriation		\$233,460.00							
New Sewer		3,600.00							3,600.00
New Well		500.00							500.00
Dormitory Fees			16,447.30						16,447.30
Department Fees			2,026.59						2,026.59
Department Service			1,319.89						1,319.89
Department Sales			26,632.50						26,632.50
Interest.			775.33						775.33
Tuition.			10,575.00						10,575.00
Medical Fees			5,232.00						5,232.00
Incidentals.			9,212.50						9,212.50
Laboratory Fees			18,251.45						18,251.45
Refunds.			455.11	611.11					1,066.22
Vocational Education			150.00	1,163.75					1,313.75
4-H Club Deposits.....			853.15						853.15
Camp Coyne Deposits			75.50						75.50
Physical Ed. Fees.....			2,038.50						2,038.50
Library Fees			5,251.57						5,251.57
Transferred from Laboratory Deposits.....			162.24						162.24
Summer School			150.00						150.00
Miscellaneous.			456.37						456.37
Boarding.				52,295.20					52,295.20
Bookstore.				16,646.27					16,646.27
Military Sales				5,068.95					5,068.95
Furniture Sales				559.00					559.00

	Reserve	State	Current	Trust	Morrill 1890	Morrill 1862	Capper Ketcham	Smith Lever	Totals
Herd Testing				1,400.00					1,400.00
Poultry Testing				1,249.61					1,249.61
Special State Appropriation.....		\$4,100.00							
Total Receipts	\$4,000.00	233,460.00	\$104,569.67	\$83,508.68	\$50,000.00	\$2,500.00	\$20,481.83	\$14,432.82	\$517,053.00
Total Expenditures		233,460.00	97,122.47	74,137.84	50,000.00	2,500.00	20,481.83	13,966.50	
New Sewer		1,005.63							492,674.27
Balance on hand.....	\$4,000.00	\$3,094.37	\$7,447.20	\$9,370.84				\$466.32	\$24,378.73
Reverts to U. S. Treasury.....								466.32	466.32
Balance carried forward.....	\$4,000.00	\$3,094.37	\$7,447.20	\$9,370.84					\$23,912.41

AGRICULTURAL EXPERIMENT STATION
EXPENDITURES JULY 1, 1932, TO JUNE 30, 1933

	Hatch	Adams	Purnell	Miscel.	State Feeding Stuffs	State Fertilizer Control	Egg Laying Contest	Totals
Buildings and Land.....	\$556.70	\$78.20	\$5,633.48	\$556.18			\$20.90	\$6,845.46
Communication Service	127.55	14.10	350.40	135.63	\$20.00		139.92	787.60
Contingent Expenses	12.00		121.11	71.47			44.75	249.33
Feeding Stuffs	59.10	479.55	722.48	753.00			1,061.91	3,076.04
Fertilizers.	79.60	39.00	607.85	29.75				756.20
Furniture.	114.75		184.45	71.08			6.30	376.58
Heat, Light, etc.....	305.82	231.35	729.01	139.92	20.00		164.69	1,590.79
Labor.	3,968.06	2,262.71	8,137.65	3,200.30		\$44.00	1,049.99	18,662.71
Library.	334.57	5.00	29.22	60.90				429.69
Live Stock	265.25	14.40	27.50					307.15
Publications.	475.04		302.68	42.90	150.00	86.50		1,057.12
Salaries.	6,985.57	11,569.68	38,798.54	1,288.09	1,000.00	4,070.85	1,477.60	65,190.33
Scientific Equipment	25.42	13.22	686.49	7.88				733.01
Scientific Supplies, Consumable.....	158.44	48.59	799.46	26.65	17.25	50.58	6.25	1,107.22
Stationery and Office Supplies.....	295.64		177.33	62.95			139.89	675.81
Sundry Supplies	565.24	165.86	406.95	322.39	7.75	9.82	133.32	1,611.33
Tools and Machinery.....	425.36	68.25	1,364.95	346.93		11.13	6.90	2,223.52
Transportation of things.....	105.72	8.65	223.27	77.15		.35	7.06	422.20
Traveling.	140.17	1.44	697.18	409.47	85.00	142.40	2.00	1,477.66
Total.	\$15,000.00	\$15,000.00	\$60,000.00	\$7,602.64	\$1,300.00	\$4,415.63	\$4,261.48	\$107,579.75

	Reserve	State	Current	Trust	Morrill 1890	Morrill 1862	Capper Ketcham	Smith Lever	Totals
Herd Testing				1,400.00					1,400.00
Poultry Testing				1,249.61					1,249.61
Special State Appropriation.....		\$4,100.00							
Total Receipts	\$4,000.00	233,460.00	\$104,569.67	\$83,508.68	\$50,000.00	\$2,500.00	\$20,481.83	\$14,432.82	\$517,053.00
Total Expenditures		233,460.00	97,122.47	74,137.84	50,000.00	2,500.00	20,481.83	13,966.50	
New Sewer		1,005.63							492,674.27
Balance on hand.....	\$4,000.00	\$3,094.37	\$7,447.20	\$9,370.84				\$466.32	\$24,378.73
Reverts to U. S. Treasury.....								466.32	466.32
Balance carried forward.....	\$4,000.00	\$3,094.37	\$7,447.20	\$9,370.84					\$23,912.41

AGRICULTURAL EXPERIMENT STATION
EXPENDITURES JULY 1, 1932, TO JUNE 30, 1933

	Hatch	Adams	Purnell	Miscel.	State Feeding Stuffs	State Fertilizer Control	Egg Laying Contest	Totals
Buildings and Land.....	\$556.70	\$78.20	\$5,633.48	\$556.18			\$20.90	\$6,845.46
Communication Service	127.55	14.10	350.40	135.63	\$20.00		139.92	787.60
Contingent Expenses	12.00		121.11	71.47			44.75	249.33
Feeding Stuffs	59.10	479.55	722.48	753.00			1,061.91	3,076.04
Fertilizers.	79.60	39.00	607.85	29.75				756.20
Furniture.	114.75		184.45	71.08			6.30	376.58
Heat, Light, etc.....	305.82	231.35	729.01	139.92	20.00		164.69	1,590.79
Labor.	3,968.06	2,262.71	8,137.65	3,200.30		\$44.00	1,049.99	18,662.71
Library.	334.57	5.00	29.22	60.90				429.69
Live Stock	265.25	14.40	27.50					307.15
Publications.	475.04		302.68	42.90	150.00			1,057.12
Salaries.	6,985.57	11,569.68	38,798.54	1,288.09	1,000.00	4,070.85	1,477.60	65,190.33
Scientific Equipment	25.42	13.22	686.49	7.88				733.01
Scientific Supplies, Consumable.....	158.44	48.59	799.46	26.65	17.25	50.58	6.25	1,107.22
Stationery and Office Supplies.....	295.64		177.33	62.95			139.89	675.81
Sundry Supplies	565.24	165.86	406.95	322.39	7.75	9.82	133.32	1,611.33
Tools and Machinery.....	425.36	68.25	1,364.95	346.93		11.13	6.90	2,223.52
Transportation of things.....	105.72	8.65	223.27	77.15		.35	7.06	422.20
Traveling.	140.17	1.44	697.18	409.47	85.00	142.40	2.00	1,477.66
Total.	\$15,000.00	\$15,000.00	\$60,000.00	\$7,602.64	\$1,300.00	\$4,415.63	\$4,261.48	\$107,579.75

AGRICULTURAL EXPERIMENT STATION
TOTAL RECEIPTS JULY 1, 1932, TO JUNE 30, 1933

	Hatch	Adams	Purnell	Miscel.	State Feeding Stuffs	State Fertilizer Control	Egg Laying Contest	Totals
Balance brought forward.....				\$124.06		\$8.53	\$3.77	\$136.36
Federal Appropriation.....	\$15,000.00	\$15,000.00	\$60,000.00					90,000.00
State Appropriation.....					\$1,300.00			1,300.00
Department Sales.....				6,161.82			2,310.98	8,472.80
Department Service.....				192.53				192.53
Department Fees.....						4,448.00	1,125.00	5,573.00
Interest.....				91.39				91.39
Refunds.....				24.10				24.10
Miscellaneous.....				1.00			10.00	11.00
Total Receipts.....	\$15,000.00	\$15,000.00	\$60,000.00	\$6,594.90	\$1,300.00	\$4,456.53	\$3,449.75	\$105,801.18
Total Expenditures.....	15,000.00	15,000.00	60,000.00	7,602.64	1,300.00	4,415.63	4,261.48	107,579.75
Balance on hand and carried forward.....				*\$1,007.74		\$40.90	*\$811.73	*\$1,778.57

* Dr.

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 said college, and find the same correct.

THOMAS G. MATHEWSON,
CHARLES ESTES,
Auditors.

**Summaries Dealing with Receipts and Expenditures
For the Year Ending June 30, 1933**

Balance brought forward July 1, 1932.....	\$13,155.82
Total income during year.....	609,698.36
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Total.....	\$622,854.18
Total expenditures during year.....	600,254.02
<hr/>	
Balance on hand June 30, 1933.....	\$22,600.16
Unexpended balance reverting on Smith-Lever Fund.....	466.32
<hr/>	
Balance carried forward July 1, 1933.....	\$22,133.84

INCOME

Income from Students:	
Tuition fees	\$10,575.00
Matriculation and incidental fees.....	9,212.50
Dormitory fees	16,447.30
Medical fees	5,232.00
Laboratory fees	18,251.45
Physical Education fees.....	2,038.50
Library fees	5,251.57
Summer School	150.00
Dining Halls	52,295.20
Store Sales	16,646.27
Department fees	2,026.59
<hr/>	
	\$138,126.38
Income from State and Nation:	
State Maintenance	\$233,460.00
Special State Appropriation:	
New Sewer.....	3,600.00
New Well.....	500.00
Morrill Act of 1890.....	50,000.00
Morrill Act of 1862.....	2,500.00
Hatch Act of 1887—Experiment Sta.....	15,000.00
Adams Act of 1906—Experiment Sta.....	15,000.00
Purnell Act of 1923.....	60,000.00
Smith-Lever Act of 1914—Extension.....	14,432.82
Capper-Ketcham Act of 1928—Extension.....	20,481.83
<hr/>	
	\$414,974.65
Income from Other Sources:	
Department Sales and Service.....	\$36,229.95
Interest.....	775.33
Transferred from Lab. Deposits.....	162.24

Refunds.....	1,066.22
Vocational Education	1,313.75
Miscellaneous.....	1,385.02
<hr/>	
	\$40,932.51

Income from Experiment Station:	
Department Sales and Service.....	\$6,354.35
Interest.....	91.39
Refunds.....	24.10
Miscellaneous.....	1.00
<hr/>	
	\$6,470.84
Income from Regulatory Funds:	
State Feeding Stuffs Inspection (Appro.).....	\$1,300.00
State Fertilizer Control (Fees).....	4,448.00
Egg Laying Contest, Fees and Sales.....	3,445.98
<hr/>	
	\$9,193.98

Total Income \$609,698.36

Receipts from Tuition:	
Students taking course of one year or more.....	891
Students paying tuition non-resident in Rhode Island) at the rate of \$150.00 per year.....	109
Amount of tuition paid.....	\$10,575.00

EXPENDITURES

Expenditures, exclusive of Experiment Station and Extension Service:	
Agricultural and Botanical Supplies.....	\$1,770.28
Advertising in Publications.....	100.30
Equipment and Furniture.....	23,667.61
Forage and Veterinary Supplies.....	4,132.65
Freight and Express.....	1,754.73
Fuel.....	23,234.12
Laboratory Supplies	17,521.66
Labor.....	62,991.53
Light, Heat and Power.....	7,242.89
Motor Vehicle Expense.....	1,547.45
New Sewer	1,005.63
Office Supplies	1,683.76
Permanent Improvements	5,088.81
Postage.....	1,927.93
Printing.....	4,879.49
Provisions.....	34,495.21

Recreational.	2,036.75
Refunds.	2,055.42
Rental.	4,321.92
Repairs and Replacements.	30,125.62
Medical and Surgical.	633.36
Salaries.	188,861.28
Sanitary Supplies.	3,301.66
Special Services.	895.09
Subscriptions.	811.65
Telephone and Telegraph.	1,639.25
Traveling.	4,228.20
Transferred to Fraternity Funds.	820.00
Uncollectable Accounts.	608.22
Interest on Federal Funds.	8.85
Miscellaneous.	24,834.62
	<hr/>
	\$458,225.94
Expenditures, Experiment Station.	97,602.64
Expenditures, Extension Service.	34,448.33
Expenditures, State Feeding, State Fertilizer and Egg Laying.	9,977.11
	<hr/>
Total Expenditures.	\$600,254.02

ANALYSIS OF BALANCE, JULY 1

	1932	1933
Morrill Fund of 1890.		
Morrill Fund of 1862.		
Smith-Lever Fund—Extension Service.		
Capper-Ketcham Fund—Extension Service.		
Hatch Fund—Experiment Station.		
Adams Fund—Experiment Station.		
Purnell Fund—Experiment Station.		
Miscellaneous—Experiment Station.	\$124.06	\$1,007.74 Dr.
State Feeding Stuffs.		
State Fertilizer Control.	8.53	40.90
Egg Laying Contest.	3.77	811.73 Dr.
Current Fund.	4,504.67	7,447.20
Special State Appropriation:		
New Sewer.		2,594.37
New Well.		500.00
Trust Fund.	4,514.79	9,370.84
Reserve.	4,000.00	4,000.00
	<hr/>	<hr/>
	\$13,155.82	\$22,133.84

STUDENT ACTIVITIES ACCOUNT

	Dr.	Cr.
By Balance brought forward from last year.		\$1,734.18
Receipts during year:		
(a) Student Fees.	\$17,415.00	
(b) Season Tickets.	286.25	
(c) Interest.	45.02	
	<hr/>	17,746.27
To Band.	\$374.00	14.00
Baseball.	2,107.64	448.56
Basketball.	2,673.91	1,097.65
Beacon.	500.00	
Books.	41.62	
Boxing.	284.78	
Debating—Men.	166.00	
Dramatics.	400.00	
Fencing.	48.79	
Football.	6,239.95	4,031.05
Freshman Athletics.	2,010.19	270.00
Glee Club—Men.	298.50	
Improvements.	1,994.35	
Lectures.	191.50	72.75
Orchestra.	34.00	
Phi Kappa Phi.	65.00	
Student Council.	40.50	
Tax.	957.04	26.35
Tennis.	98.17	
Track.	1,905.83	697.79
Wrestling.	296.80	
Young Women's Ath. Assoc.	917.86	60.96
Young Women's Debating.	40.10	
Young Women's Glee Club.	50.00	
Cash on hand, August 31, 1933.	4,463.03	
	<hr/>	<hr/>
	\$26,199.56	\$26,199.56

ALUMNI STUDENT LOAN FUND

	Dr.	Cr.
By amount of contribution to July 1, 1932.		\$1,194.58
By amount of contribution received 1932-33.		5.42
By amount of interest accrued to July 1, 1932.		495.66

By amount of interest during 1932-33.....		20.58
To Loans out, July 1, 1933.....	\$1,683.50	
Cash on hand.....	32.74	
	<u>\$1,716.24</u>	<u>\$1,716.24</u>

CAMPUS CLOCK FUND

By gifts from Senior Classes, 1908-1919.....	\$226.41	
By amount of interest accrued to July 1, 1931.....	263.02	
By amount of interest received 1932-1933.....	29.94	
	<u>\$519.37</u>	

FREDERICK ROY MARTIN STUDENT LOAN FUND

By amount of fund received June, 1925.....	\$150.00	
By amount of interest accrued.....	32.42	
	<u>\$182.42</u>	
To loans out.....	179.50	
	<u>\$2.92</u>	

SCHOLARSHIP AWARDS

Rhode Island State Federation Women's Clubs.....	\$150.00	
To Dorothy Jane Compston.....	\$50.00	
Olive Maria Pereira.....	50.00	
Janet Wellington Lyon.....	50.00	
Triangle Club of Kingston.....	50.00	
To Lynette Juanita Goggin.....	50.00	
Women's Student Government.....	25.00	
To Thelma Eileen Huff.....	25.00	
Chi Omega Economics Prize.....	25.00	
To Thelma Eileen Huff.....	25.00	
Edgewood Women's Club.....	50.00	
To Helen Mae Taggart.....	50.00	
Mary L. Robinson Fund.....	150.00	
To Ethel Sara Johnston.....	50.00	
Dorothy Loretta Carpenter.....	50.00	
Marjorie Barrows Preston.....	50.00	
Hood Scholarship in Agriculture.....	200.00	
Herbert Ward Peabody		
Payable in 1933-34		
First Semester	\$100.00	
Second Semester	100.00	
	<u>200.00</u>	

International Harvester Co.—Anniversary Award.....		1,000.00
4 H Club Member		
To Virginia Bright McLaughlin		
Payable in 1932-33.....	\$400.00	
1933-34.....	100.00	
	<u>500.00</u>	
To Roland Marion Bishop		
Payable in 1932-33.....	\$400.00	
1933-34.....	100.00	
	<u>500.00</u>	
		<u>\$1,650.00</u>
		<u>\$1,650.00</u>

RHODE ISLAND STATE COLLEGE
REPORT OF THE AGRICULTURAL EXPERIMENT
STATION

PRESIDENT RAYMOND G. BRESSLER,
Rhode Island State College,
Kingston, Rhode Island.

SIR:

As by law required I am submitting herewith the Forty-sixth Annual Report showing the progress of the work of the Agricultural Experiment Station for the year 1933 as prepared by Dr. B. E. Gilbert, Director of Research.

Respectfully submitted,

G. E. ADAMS,
Director, Experiment Station.

RHODE ISLAND STATE COLLEGE
REPORT OF THE AGRICULTURAL EXPERIMENT
STATION

DEAN AND DIRECTOR GEORGE E. ADAMS,
Rhode Island State College.

DEAR SIR:

I have the honor to submit to you the Forty-sixth Annual Report¹ of the Rhode Island Agricultural Experiment Station.

The past year has been characterized by events of outstanding importance in connection with the national agricultural situation. Legislation of various types has been enacted by the Federal Government with the purpose of relieving the farmer of some of the burdens loaded upon him by the acute world-trade depression. Directly or indirectly these events have had their influence upon all organizations connected with agriculture.

With the passage of the Agricultural Adjustment Act the services of workers in the field of agricultural economics became increasingly in demand. In the local situation the necessity of furnishing facts and statistical data which would throw light upon the dairy situation, became of major importance. The study on the "Cost of producing milk in Rhode Island" was pushed to completion and in every way possible, information was furnished which seemed likely to be of value to those organizations and individuals whose efforts were directed to securing an adjustment of the dairy situation. Increasing demands for services of an extension nature were met by assigning more of the time and salaries of the workers in agricultural economics to such activities. In addition to services rendered by workers on the college payroll, one staff member has been allowed to devote a portion of his time to assisting the Federal Land Bank of Springfield in connection with appraisal of Rhode Island farm loans.

Following the trend of the times towards greater economy, a re-organization has been carried out whereby all the agricultural interests of the college have been united in one school. Several sta-

¹Contribution No. 449. In Bulletin of Rhode Island State College, Vol. XXIX, February, 1934.

tion workers have assumed new duties as department heads or are devoting part of their time to teaching. It is to be hoped that the teaching, extension, and research activities will each benefit from such an efficient combination and elimination of possible duplication of effort.

In line with this reorganization and realizing the acceleration of change of emphasis in agricultural research which has developed during recent years, adjustments in the research program have been constantly underway. In the annual report of 1930 a list was given of research projects which were terminated during the previous two-year period. The following list gives the projects which have been discontinued during the years 1931 to 1933 inclusive and serves to mark work either completed or terminated to make way for projects more nearly suited to existing conditions.

Adams Fund. Use of internal disinfectants in intestinal diseases of poultry.

Pullorum disease (Bacillary white diarrhea) of fowls.

A study of the effect of long-time phosphating on the solubility of the aluminum of the soil.

A study of the decay of different organic fractions of buckwheat roots and the production of a toxin harmful to plants.

Purnell Fund. A study of the soil moisture and organic matter relations of certain market-garden crops.

The form and proportions giving satisfactory results in utensils used in the household for pouring.

The selection of potatoes for table use as affected by (A) method of fertilization and (B) variety of potato.

A study of egg-production and meat value of an established strain of fowls resulting from a Brahma-Leghorn cross.

Influence of fertilizer treatment on the vitamin content of spinach.

Comparison of methods of refrigeration in the rural home in Rhode Island.

There have been adjustments in connection with the buildings and lands administered by the Experiment Station which are worthy of comment. In order to afford better facilities for work in horticulture a service building has been erected on the East Farm. This furnishes adequate space for future developments in connection with research work in small fruits or other similar needs. A shed at the rear of the building gives storage space for farm implements. Through the cooperation of the Citizens Conservation Corps it has

been possible to have an area of the East Farm woodlot cleared of brush with no expense to the station. A small addition has been built to the west of the market-garden shed to meet the needs of the work with lawn and golf grasses.

RESEARCH WORK

The more important lines of work to which members of the research staff have given attention during 1933 are discussed. Where possible, reports of progress and results of research are given. Many of the latter, however, can be regarded only as trends or impressions until established by further experimentation.

Agricultural Economics

Costs of Milk Production. The study of the cost of producing milk in Rhode Island has been completed and a report prepared for publication. This study was undertaken at the request of two agricultural organizations, the Rhode Island Agricultural Conference and the Local Dairymen's Cooperative Association. Records were kept by 39 farmers for the 12 months ending January 31, 1933.

The average cost of producing milk on these farms was \$2.79 per 100 pounds, \$0.060 per quart, or \$211.09 per cow. The number of cows per farm averaged 20.1 and the production of milk per cow averaged 7,566 pounds.

Feed was 50 per cent. of the cost; man labor, 21.4 per cent.; overhead charges, 10.8 per cent.; net replacements, 7.0 per cent.; depreciation of herd, 6.9 per cent.; and other items, 3.9 per cent. Purchased feeds were about 40 per cent. of the total feed cost.

The average consumption of feed per cow was: grain, 2,853 pounds; beet pulp, 377 pounds; hay, 3,423 pounds; other dry roughage, 786 pounds; corn silage, 6,080 pounds; green feed, \$4.55, equivalent to the value of 529 pounds of hay; and pasture, \$7.06, equivalent to 70 days of pasture at \$0.10 per day.

The man labor per cow was 165 hours; horse labor, 0.6 hours; and truck-use, 21.7 miles.

The investment per cow in building was \$116.02; in dairy equipment, \$15.35; in the milking herd, \$111.94; and, in cash or credit for current expenses, \$20.00. Miscellaneous items cost \$6.96 per cow.

Replacements were one for every 2.9 cows. The decrease in the value per head during the year was 17.5 per cent of the beginning value.

There were 19 herds with relatively high production and 20 herds with relatively low production. The feed cost in the high-producing herds was \$0.42 less per 100 pounds of milk than in the low-producing herds, and the total cost was \$0.53 less. The man labor was 0.3 hours less.

On 27 farms corn silage was fed and on 12 farms it was not. Where corn silage was fed the average quantity per cow per year was 8,027 pounds. On the farms not feeding silage the increases in the other feeds were: grain, 169 pounds; beet pulp, 470 pounds; hay, 938 pounds; other dry roughage, 484 pounds; green feeds, \$0.19; and pasture, \$1.20.

On 17 farms where milking machines were used the man labor per 100 pounds of milk produced was one-half hour less than on 22 farms where the cows were milked by hand. The man labor per cow per year was 30 hours less. The production of milk per hour of man labor was 10.4 pounds more on the farms where milking machines were used. The average value of milking machines was \$194. The farms with milking machines averaged 25.7 cows per farm and the farms without milking machines, 15.9 cows per farm.

Dairy Herd Replacements. At the present time some dairymen are raising their herd replacements while others buy them. Those dairymen who believe in raising their replacements point to the disease factor and to the advantage of owning cows of known ancestry. On the other hand, those dairymen who believe in buying replacements call attention to the fact that this is a territory of relatively high-priced milk markets and a territory in which pasture is scarce and feed costs are high. A large number of dairymen are undecided as to which is the more profitable practice to follow.

The purpose of this study is to obtain some facts which will be useful in helping a dairy farmer in this territory to arrive at a decision in regard to herd replacements which will be economically sound on his farm and under his particular set of conditions. The method being used is of the farm survey type. Each farm included

in the study is visited and a farm business record obtained. These records will permit the calculation of the labor income for the farm as a whole and also will provide the data for determining the costs and returns on the dairy enterprise separately. These records will be tabulated by type of farm and by method of herd replacement. This survey is being supplemented by information from Dairy Herd Improvement Association records.

Effect of Butterfat Content of Milk on Feed Costs. The fact that it costs more to produce milk of high butterfat content than milk of low butterfat content is recognized in most markets by a butterfat price differential. The butterfat differential prevailing in the Providence market has been based on the wholesale price of 92 score butter. In many other markets the butterfat differential is higher than it is in the Providence market. The relative profitableness of producing milk with a high butterfat test as compared with milk with a low butterfat test depends almost entirely upon this butterfat differential. The purpose of this study is to determine whether or not the butterfat differential in the Providence market is large enough to cover the additional costs incurred when milk with a high butterfat test is produced.

Costs and Returns from Grading Vegetables. Some results from a study of the cost and returns from grading certain vegetables on farms close to market were reported last year. This study has been developed further, particularly with reference to the competition from shipped-in vegetables. It has often been claimed that strict grading must be practiced by local producers in order to meet the competition from other sections. The data procured show Providence wholesale prices throughout the year and the quantities received for each vegetable studied, both from distant sources and from local growers. The facts appear to be that local growers have held their market through price competition. Usually shipped-in produce ceases to be a factor when a considerable volume of local goods are available. Prices during much of the local-production season are lower than at any other time of year. They are so low, in fact, that distant growers cannot afford to ship their goods to Providence.

Staking Tomatoes. Some development has been made of data on the costs and returns from staking tomatoes as compared with leaving the vines on the ground. This is a new practice in local territory and market gardeners are much interested in the results obtained. Many believe that the costs of staking are so great that no net profit can be obtained from the practice. Others point out that the increased number of plants per acre, the earlier maturity and accompanying higher prices, and the improvement in quality will more than offset the additional costs. It is hoped that this study will give a reliable basis for answering the question.

Consumers' Demands for Eggs. Bulletin No. 240, "A Study of Consumers' Preferences and Practices in Buying and Using Eggs," was published during the year. This bulletin gives the results of two surveys of consumers; one in 1928, a period of prosperity, and the other in 1932, a period of severe depression. The same localities were visited in both years and in many cases the same people were questioned.

A few of the results of this study follow:

In both 1928 and in 1932 more Providence housewives reported buying eggs from farmers than from any other source.

Chain stores and large "downtown markets" were more important sources of eggs in 1932 than in 1928.

The size of the average purchase of eggs increased considerably in 1932 as compared with 1928. Probably this was due to offering a price discount for purchases of two dozen or more, to the better quality of eggs available, and to better storage facilities in the home.

In 1928, 47 per cent of the housewives made their egg purchases once a week and in 1932, 68 per cent purchased eggs once a week.

Marked decrease was reported in the number of inedible eggs found in 1932 as compared with 1928. In 1932 one inedible egg was found in every 5.2 dozens, while in 1928 one was found in every 3.8 dozens.

Eggs were used because people liked them, because they were considered healthy, and because they were convenient to prepare.

The average price at which fresh eggs were considered economical in 1928 was 54 cents per dozen, and in 1932, 34 cents.

Providence housewives were willing to pay a considerable premium for Rhode Island eggs as compared with western eggs, and were also willing to pay a

premium for western eggs as compared with cold storage eggs, but this was much less than in the former case.

Brands and trade marks had made little impression on egg consumers in Providence.

There were many factors in this study which indicated that Rhode Island producers might organize and furnish eggs directly to Providence housewives through retail routes, with benefits to the quality of eggs purchased by consumers and with possible benefits in income to producers.

Agronomy and Horticulture

FIELD CROPS. Fertilizer Requirements. During the past season ensilage corn was grown on the plats used as checks on the different levels of fertilizer. With each increase in the amount of nitrogen applied small increases in yield were obtained. The use of extra phosphorus or extra potassium did not result in significant increases in yield. Where 600, 900, and 1,200 pounds per acre of a standard fertilizer were used, the yields of silage corn on a green-weight basis were 14.74, 19.29, and 18.11 tons per acre respectively.

Potatoes were grown on the plats where different phosphorus carriers are compared. Rock phosphate has continued to be inferior when compared with other carriers on an equal cost and on an equal amount of phosphorus per acre basis.

When compared with the other carriers on an equal amount of phosphorus per acre, basic slag continued to be more effective on the acid plat.

Magnesium Deficiency in Soils. The study of potato response to magnesium was carried on with several different fertilizer treatments. One-half of each of the plats used in the experiment where the different carriers of phosphorus are compared was treated with magnesium sulfate. On the non-limed plats very striking increases in yield were obtained from the use of magnesium. On the limed plats no significant response resulted. The effect of previous fertilization on the magnesium supply of the soil was less marked this year than has been found in previous years. Magnesium was applied to corn, potatoes, mangels, and turnips on the plats where

the effect of crops on succeeding crops is measured. No beneficial effect was noted from the magnesium application.

High magnesium limes continued to give the best results in cooperative potato tests where high soil acidity accompanied by a magnesium deficiency has caused a decrease in the yield of potatoes.

Soil Acidity and Liming. A manganese deficiency was again very manifest on a high-lime soil. Table beets treated with manganese yielded 238 per cent more than the untreated.

Crop Effects on Succeeding Crops. The following crops were grown on this project: corn, turnips, mangels, and potatoes. The yield of corn was the largest following red and alsike clover, and poorest following potatoes and corn. Turnips yielded the most after squash and the smallest yield was secured after a succeeding crop of turnips. The yield of mangels was highest after onions and squash and lowest after millet and a previous crop of mangels. Potatoes gave the lowest yield when following turnips and millet and the best yield after onions and carrots.

Seed Sources and Varieties. Northern-grown potato seed continued to be superior to home-grown seed. In a study of the effect of previous fertilizer treatment of the tuber on yield no consistent differences were observed.

In a test of lespedeza varieties extra early Korean (No. 65280) was the only variety that matured a crop of seed. Korean Common gave the largest yield of hay per acre and was followed very closely by Kobe.

Manchu and Dunfield soybeans were the earliest maturing varieties in a soybean variety test. The Pekwa variety gave the largest yield in tons per acre on a dry-matter basis.

West Branch Sweepstakes ensilage corn produced the highest yield in tons per acre on a dry-matter basis. The Eureka variety was second in order of yield. The Rhode Island Flint and Cornell 11 were the earliest maturing, while Eureka was the latest. At harvest time the Eureka was in the milk stage. On green-weight basis Eureka was first with 19.2 tons per acre, Lancaster Sure Crop second with a yield of 16.6 tons, and West Branch Sweepstakes third with a yield of 15.0 tons per acre.

Plant Breeding and Selection. The breeding work with alfalfa was continued as in previous years. Several promising strains from the standpoint of seed production have been isolated. One strain appears to be both a good seed producer and a vigorous one vegetatively. Indications are that some strains are more resistant to leaf spot than others. Several crosses were made in the greenhouse and considerable seed obtained.

Twenty selfed strains of Iceberg lettuce were compared. Although there have been some variations in type obtained, none, so far, seem of outstanding promise.

Several crosses were made between selfed strains of eggplant. So far no combination of satisfactory type and disease resistance has been obtained.

MARKET-GARDEN CROPS. *Fertilizer Requirements.* When the nitrogen content of the standard fertilizers used was cut to one-half or less, yields of all the vegetable crops being grown in the market-garden experiments were reduced with the exception of peppers. The yields were reduced in the following order from highest to lowest amount of decrease: Late spinach, late beets, early tomatoes, early spinach, early cabbage, early lettuce, early beets, late carrots, and celery.

Omitting the phosphorus produced widely varying results: Cabbage and beets were not affected; tomatoes and celery yields were decreased slightly on the green-manure rotation, but not where stable manure was used; lettuce, spinach, and late carrot yields were lowered when this element was omitted. Peppers did not show the usual response.

Omitting the potash in the fertilizer produced the following results: Celery yields were reduced more than any other vegetable; early tomatoes and cabbage were lower in yield on the green-manure rotation; early lettuce and late spinach were decreased in yield on the manure rotation.

Applying all nitrogen before planting was again compared with the use of one-third before planting and the application of the remaining two-thirds as a side-dressing. The last method not only proved better with late spinach as reported the previous season but also with early lettuce and late celery.

Increasing the standard application of about 1,500 pounds of fertilizer by 35 per cent increased the yields of early cabbage and lettuce, late beets and spinach on the stable-manure rotation; and early tomatoes on the green-manure rotation. When the increase was 75 per cent, late beets was the only crop which gave an increase over that secured with the 35 per cent extra application. Crops which were increased by the 75 and not by the 35 per cent extra application were cabbage where green-manure replaced stable manure, tomatoes and celery where stable manure had been applied for the previous crop.

Omitting manganese in the fertilizer did not affect the yields of early lettuce and beets. With early and late spinach and also with late beets yields were less where manganese was omitted.

Stable Manure vs. Green Manure. Thirty-two tons of manure per acre and a complete fertilizer gave appreciably larger yields than 16 tons and a like fertilizer with early spinach, beets, and peppers. Where green manure is plowed in with 16 tons of manure and fertilizer the yields of early spinach and beets practically equalled those obtained with the 32 tons of manure and fertilizer. When the application was decreased from 16 to 8 tons, yields of spinach were lower by 235 bushels per acre, beets by 427 dozen bunches, while the yield of peppers remained about the same. The fall crop of carrots was practically as good where the spring application of manure was 16 as where it was 32 tons. Where it was only 8 tons the yield was about 50 bushels lower.

Another comparison consisted of application between 16 and 24 tons of manure per acre. Yields of early crops of cabbage, tomatoes, and lettuce were higher where the 24 tons were applied. The differences in the case of tomatoes and lettuce were larger than the average, being from 10 to 15 per cent. The late crop of celery, beets, and spinach showed little, if any, variation which might be due to the early manure application.

Where 20 tons of manure is being compared with chemicals and green manure the results this year showed the manure plat to have the advantage. Somewhat larger yields of cabbage, spinach, and tomatoes were obtained on this plat. Seasonal variations in rain-

fall and temperature affect the yields on these plats to a considerable extent.

Strains and Varieties. In the test of pepper varieties World Beater gave the largest yield. California Wonder was second with a yield of a little over 700 bushels per acre. Early Giant was earlier than the above mentioned varieties but produced a smaller total crop.

Speed was again the earliest tomato, the first picking being made July 11. Bonny Best, Early Wonder, and Bestal gave larger total crops and were a little later.

In the strain test of New York or Wonderful lettuce, No. 12 was one of the leading strains. Strain No. 4 from Pieters-Wheeler Company was a little later and larger but equally promising.

A few strains of Golden Acre cabbage were again tried. The Viking strain from Stokes was slightly the earliest with Livingston's Special, a close second. There was a difference of 18 days between the first cutting date of the earliest strain and the latest strain grown in the test.

Virginia Savoy spinach gave a larger yield than King of Denmark, Reselected Bloomsdale, or Nobel Giant Leaved. The strains were planted on August 25.

Harris' strain of Crosby's Egyptian beets gave the largest yield in a comparison of two strains of this variety and two of Early Wonder.

In the test of early yellow sweet corn, bacterial wilt caused much damage. Golden Gem was seriously affected. Extra Early Bantam and Golden Sunshine were considerably damaged, Spanish Gold only slightly, and Golden Cross Bantam practically not at all. Golden Gem was the earliest and smallest with Spanish Gold only two days later and considerably larger. The Early Bantam and Sunshine were three to five days later and were larger than Spanish Gold. The Golden Cross Bantam was 17 days later than Spanish Gold and about 50 per cent larger.

GRASS AND TURF EXPERIMENTS. *Lawn Grasses.* The lawn experiments have been continued and have yielded many interesting results during 1933. The most acid lawn plats were seriously in-

jured by applications of fertilizer which were not found injurious to turf plats where the soil was less acid. Nitrate of soda caused more injury than sulfate of ammonia when applied to the most acid plats of Colonial bent. Later in the season, the same and other plats fertilized with nitrate of soda or mixtures containing nitrate of soda were more heavily damaged by "brownpatch" disease than were the plats fertilized similarly with sulfate of ammonia. In an experiment concerned with methods for rejuvenating an unthrifty, sparsely grassed turf, it was found desirable to use compost top-dressing in addition to rather heavy fertilization. Earthworms, grubs, and mouse-ear chickweed have been controlled by the use of 5 to 10 pounds of arsenate of lead per 1,000 square feet of turf per season.

Fine-Turf Grasses. Experiments with closely-cut fine turf grasses now in progress comprise the following: Characteristics of turf from stolons, seed, and individual plants in seven strains of velvet and creeping bents; comparisons of many kinds of bent grasses in order to discover those of high turf-forming quality; tests of brownpatch remedies; tests of insecticides for the control of webworms; and, investigations regarding the occurrence and control of brownpatch and dollarspot on all fine turf plats. Unlooked-for pests of 1933 were cutworms and a disease caused by blue-green algae. The latter no doubt occurred as a result of continuously excessive moisture in the soil during the latter part of the season.

The section devoted to a comparison of fertilizer ratios as they may affect the quality of three fine turf grasses is well established. The test has shown a marked deficiency in the soil nitrogen but none in phosphorus or potash. Approximately the same areas of brownpatch occurred in the low, medium, and high nitrogen plats.

Bent Grass Seed Production. Seed yields were obtained from ten varieties of bent grass. Satisfactory yields were secured from redbot, Colonial bent, velvet bent, and creeping bent. Lime applied in the spring was found to increase slightly seed yields in redbot and creeping bent, to increase them appreciably in Colonial bent, and to have practically no effect on velvet bent. When additions of

nitrogen were lowered the yields of seed from velvet bent were decreased.

A project to determine the fertilizer ratios best suited to seed production with Rhode Island Colonial bent was continued. Yields have been increased largely in proportion to the quantities of nitrogen applied. Little effect has been evidenced from applications of phosphorus or potash. Plats which receive no fertilizer and those treated with small quantities of nitrogen have been invaded by much of the vegetation common to neglected meadows while plats receiving medium and high quantities of nitrogen continue relatively pure.

SMALL AND DRUPE FRUITS. Blackberry Breeding. Greenhouse cross pollination was continued the past year with the following plants: "A 5" (1929 seedling), Corey, Loganberry, Phenomenal, Himalayan Giant, Oregon Evergreen, Thorny Youngberry, Thornless Youngberry, Thornless Mayes, Austin, Lucretia, Snyder, El Dorado, and New Hampshire (wild seedling). It was thought that the dying-back of some of the plants in 1932 was due, perhaps in part, to their being confined to pots, and accordingly this year they were set in good soil in greenhouse beds and generous fertilization given. At the beginning the growth was excellent and the plants blossomed well, giving a good opportunity for cross pollination work. A total of 114 clusters were cross pollinated embracing an estimated number of about 450 flowers. Of these, 99 flower clusters were apparently fertilized but only 52 completed growth of berries and produced seed. The experience of last year was largely repeated and northern varieties suffered from withering and dying-back of branches and failed to mature fruit. Of 63 crosses of southern varieties used as seed parents including Mayes, 46, or about 73 per cent produced seed. Of 36 crosses in which Northern plants, including Lucretia, were used as seed parents, only six produced seed and five of these were from Lucretia.

Fertilization of Red Raspberries. The raspberries in this experiment set well and a good crop of fruit was harvested. Considerable top soil was washed from some plats to others by exceedingly heavy rainfalls during the previous autumn, and the significance of some of the yields is accordingly somewhat uncertain. Neverthe-

less, the yields indicated some rather interesting facts which, in general, substantiate records previously obtained in other experiments. The lowest yields were secured from check plats to which no fertilizers had been applied, the next higher yields come from plats receiving no potash, the next where no nitrogen was used, the next where no phosphoric acid was used, and the highest yield was obtained where a complete fertilizer was applied. Taking the average of the plats receiving complete fertilizer as the base, or 100, the check plats yielded approximately 44 per cent, the no-potash plats 60 per cent, the no-nitrogen plats 72 per cent, and the no-phosphoric acid plats 89 per cent as much as the base plats.

Experiments with Drupe Fruits. Results from the drupe fruit orchard during 1933 were distinctly encouraging, especially with plums. The orchard was given intentionally little spraying in 1932 and brown rot and curculio wrought a great amount of damage. Sprays to control these pests were applied during the past season resulting in little damage on early maturing fruit. Fruit ripening after a rainy spell during the latter part of August developed some brown rot.

Some of the varieties which came into bearing this year are quite promising. On the basis of experience of the two seasons there would seem to be no reason why certain varieties of plums of good quality cannot be grown in Rhode Island if given the same care accorded apple orchards by up-to-date growers.

Chemistry, Plant Physiology, and Pathology

CHEMISTRY. Nitrate vs. Ammonium Nitrogen for Celery. Celery was grown in the greenhouse in large beds of sand supplied with culture solutions by the constant drip process. Three treatments were compared: all nitrate nitrogen; four-fifths nitrate, one-fifth ammonium; and one-fifth nitrate, four-fifths ammonium. Each solution was applied at pH 6 and pH 8, but the buffering power of the sand, and phosphate component of the solution that was applied separately, and differential absorption of ions by the plants, brought the acidity of both series to pH 6 for the all nitrate treatments, and approximately 5.3 for those containing ammonium nitrogen.

Culture solutions that had proved satisfactory for beets were too high in nitrates for celery and two out-breaks of blackhearts resulted. It may be of diagnostic value that just previous to the out-break there were 1,200 p. p. m. of nitrate nitrogen in the juice expressed from leaflets from which the midveins were removed. The sand beds were leached with water and water was substituted for the culture solutions for a week following the out-breaks to allow the plants to recover. Each time the nitrate nitrogen and the reducing sugars in the juice decreased while the sucrose increased. The nitrate concentration of the solution was reduced to a safe value.

In the order of the treatments (all nitrate; four-fifths nitrate, one-fifth ammonium; one-fifth nitrate, four-fifths ammonium nitrogen) the relative yields were: solution pH 6, 100:71:18; pH 8, 117:84:29. Thus the ammonium sulfate used proved detrimental and to a greater degree, in the more acid solution.

Especially nitrates and to a lesser degree, ammonium nitrogen, in the plant juice was correlated with the concentrations in the treatment. There was a tendency for reducing sugars and ammonium nitrogen to remain high in the depressed crops. Nitrate nitrogen concentrations proved the best index to a satisfactory growth rate under these conditions.

Both nitrates and reducing sugars were higher in the juice from the midveins of leaves than in the remainder of the tissue.

Optimum Levels of Soil Nitrates at Different Periods in the Growth of Celery. Celery was grown during mid-summer in sunken cylinders containing 8 inches of soil above a deep layer of sand. Manure was applied at the rate of 8 tons per acre and superphosphate and sulfate of potash sufficient to make the total application equivalent to 3 tons of 5-8-7 fertilizer per acre. The soil was limed to pH 7. The growing period was divided into three parts and 19 different combinations of low (10 p. p. m.), medium (25 p. p. m.), and high (50 p. p. m.) of nitrate nitrogen were maintained in the soil by analysis twice each week, followed by applications of sodium nitrate from analyzed solutions to replace disappearance. Thus a LMH treatment signifies 10 p. p. m. of nitrate ni-

trogen for the first one-third of the growth period, 25 p. p. m. for the second, and 50 for the third.

The crop grew rapidly and large yields of good quality were harvested. Abundant watering for all treatments may have been a factor in producing plants larger than those usually grown in the field with this variety, Golden Plume. No blackheart resulted, even from the highest concentrations of sodium nitrate used.

Results for two seasons are at hand and are in good agreement. Each year a check treatment maintained at 75 p. p. m. of nitrate nitrogen throughout the growing season has produced the largest crop but at a tremendous expenditure of nitrogen equivalent to 1150 pounds per acre in 1932. This would be unsafe unless abundant water was available. Disregarding this very high treatment, the best group of treatments for the two years have been HHH, LHH, and MHH. Apparently the nitrate level may be kept low for small celery plants but should be raised during the last two-thirds of the growth period, and should be maintained at approximately 50 p. p. m. during the last period if the soil can be kept sufficiently moist. This applies only to soils at least as heavy as silty loams. The treatments HLL, LLL, MLL, and HML gave low yields consistently, and no treatment which was low for two of the three periods came within the best ten yields in either year.

Certain Components of the Juice of Celery as an Index to Current Supplies of Nitrogen. Celery was grown during mid-summer in 18 frames, 0.001 acre in area. The spacing and general culture was similar to that used in the field. Manure was applied at the rate of 8 tons per acre, and superphosphate and sulfate of potash sufficient to make the total application equivalent to 3,300 pounds of a 6-8-6 fertilizer per acre. The soil was limed to pH 6.5. Soil nitrates were determined twice each week and sodium nitrate was applied in analyzed solutions in accordance with the analysis to maintain the following nitrogen levels: Very low (5 p. p. m.); low (10 p. p. m.); medium (25 p. p. m.); high (50 p. p. m.), and two combinations of levels, MLH and LHM as discussed in the preceding section of this report. Each treatment was in triplicate. The relative yields of celery trimmed for market in the order listed

above, were 75:83:100:79:97:85. For the optimum yields, 170 pounds of nitrogen per acre was required to maintain 25 p. p. m. throughout the growth period, and 210 pounds for the MLH treatment. Water was used to carry the nitrogen applications into the soil, but probably not sufficient water to maintain optimum soil moisture during the first part of the growth period.

Nitrate nitrogen in the juice was in close agreement with the levels maintained. For the optimum treatment, the 25 p. p. m. level, there were approximately 175 p. p. m. of nitrate nitrogen in the juice expressed from leaflets, midveins removed, from July 24 to August 14. After mid-August the concentration increased to approximately 400 p. p. m. The crop producing the lowest yield contained less than 100 p. p. m. of nitrate nitrogen almost throughout the season. Ammonium nitrogen, sucrose, and reducing sugars in juice from the same samples fluctuated widely from week to week but showed no consistent agreement with concentrations or yields. Sucrose was present in much greater concentration early in the season and reducing sugars accumulated later in the growth period.

PLANT PHYSIOLOGY. Winter Tomato Culture. Further data were accumulated to throw light on the possibility of the control of soil nitrogen with a greenhouse crop. A zone of approximately 20 p. p. m. and an application of 52 pounds of cow manure (13.81 pounds of organic matter) per greenhouse section gave better yields than one-half or double the amounts of nitrate nitrogen and manure. This data aids in fixing the optimum amounts of nitrate nitrogen which should be maintained under rapidly growing winter tomatoes.

Tomatoes grown in sand without any organic matter but with 20 p. p. m. of nitrate nitrogen and optimum nutrients were depressed in yield 13 per cent when compared with plants grown in sand and having the same nutrients, nitrate nitrogen and 52 pounds of cow manure, while the latter when compared with soil-grown plants having 52 pounds of manure and 20 p. p. m. nitrate nitrogen yielded 17 per cent less.

Winter Gladiolus Culture. An additional season's data were secured as to the effects of supplementary lighting on the time and

amount of bloom with winter gladiolus. In the main this year's results confirm those of other seasons in that an additional five hours of artificial lighting from a 100-watt bulb greatly increased flower yields.

Gladiolus were also grown in field plats where two acidity levels (pH 5.3 and 7) are maintained. With four varieties no significant differences in growth, numbers of flower spikes or flowers, or numbers and weights of corms were observed.

During the summer the effect of nitrogen fertilization on gladiolus was investigated by growth in pots. Keeping the potassium and phosphorus applications optimum and the same, three levels of nitrate nitrogen were maintained in the soil (0; 18; and 70 p. p. m. nitrate nitrogen). No significant differences were noted with the flowers, either in numbers or length of flower spikes. There was a slight tendency towards lessened flowering with higher soil nitrogen. However, with the same numbers of harvested corms a decided gain in weight of corm was noted from pots fertilized with the larger amounts of nitrate.

Nutrient Needs of Grasses. More information has been secured as to the nutrient requirements of red clover, timothy, redbtop, and Rhode Island bent. These crops were grown in triplicate in soil-sand mixtures as described in the 1932 annual report. In general, the results duplicated those of former years with the exception that red clover showed little response to increased applications of potash. None of the crops gave significant response to potash; all except clover responded definitely to greater quantities of nitrogen; and the entire four crops gave increased yields with more phosphorus.

Availability of Certain Phosphatic Carriers. A crop of red clover was grown in triplicate in pots following the same technique as described in the 1932 report. Ammoniated superphosphate furnished by the Bureau of Chemistry and Soils, U. S. Department of Agriculture, continued to give promise as a carrier of phosphoric acid and nitrogen.

In addition to the use of ammoniated superphosphate several synthetic carriers produced in the laboratories of the Bureau of Chemistry and Soils were compared as to availability of phosphoric acid.

Of these unusual and new carriers, potassium metaphosphate and magnesium phosphate, gave promise of relatively optimum availability.

Toxic Aluminum vs. Weed Growth. For many years the Rhode Island station has conducted experiments with weedless lawns and was the first to suggest the control of weeds by acidifying the soil by the use of sulfate of ammonia. No explanation has been secured to show why fewer weeds are present in a treated lawn. Rough and smooth leaf crabgrasses, common and fall dandelions, and yellow fox-tail have been compared with Kentucky bluegrass, Rhode Island bent, and redbtop as to their comparative resistance to varying quantities of aluminum in solution cultures. In general, the above weeds and Kentucky bluegrass were depressed in yields by smaller amounts of aluminum than were the acid-tolerant grasses Rhode Island bent and redbtop.

PLANT PATHOLOGY. Tests of Seed Treatment. Tests were conducted with eight different commercial compounds used as seed disinfectants on tomatoes, peppers, eggplants, cabbage, lettuce, and spinach seed. The mercuric bichloride solution 1:1000 gave the best control with cabbage; Semesan and Merko gave the best results on lettuce seed; while Formo-dust showed the best results with tomatoes. Excellent results were obtained with P. D.-7 on spinach. The results with eggplants and peppers were unsatisfactory due to low germination. Tests in the field with spinach showed that P. D.-7 was as effective as red oxide of copper and much superior to a copper sulfate solution. Studies on the seed treatment of corn showed that Merko and Semesan treated seed produced a better stand.

Disease Control. A comparison of commercial compounds used for the control of brownpatch and dollarspot on bent grasses showed that one-third mercuric bichloride and two-thirds calomel were just as effective as any other compound used.

Home Economics

The Rural Rhode Island Homemaker who Contributes to the Family Cash Income. There is timely interest in this study because of

the fact that it was begun before the depression had produced drastic effects upon conditions in rural Rhode Island and continued until unemployment had greatly increased. Of 624 records, 39 per cent report paid work carried on at home. This includes not only the usual forms such as laundering, baking, rug-making, etc., but also several kinds of work farmed out from the neighboring mills which are found in almost every small village in the county studied. Another reason for the large number in this group is found in the fact that there are many summer visitors and tourists due to the location of the area which is bordered on two sides by the salt water and crossed by the two main highways between New York and Boston. Of the whole group who were gainfully employed, the largest number (310 or 34 per cent) worked in mills. Commercial work and domestic service are tied for second place with 17 per cent each. The professional group comes third, and those running hotels, boarding houses, tourist camps, and wayside stands are in the fourth place.

It is not surprising to find that more than a quarter of the number of women had only two in their families. In 21 per cent of the homes there were three members, and the number of cases gradually diminished to nine in which there were nine members, two which have ten, and one which had eleven.

The facts secured concerning the household equipment and the use of outside services which reduce the labor of housekeeping prove interesting from the economic as well as the social viewpoint. The following table gives data on the most important items:

Labor-saving Equipment and Services Used by Homemakers Who Are Gainfully Employed

Type	Number of cases	Per cent
Running water	368	59
Indoor toilets	286	46
Bath.	272	44
Electric lights	519	83.2
Washing machines	210	33
Vacuum cleaners	244	39
Electric irons	491	79
Ready-made clothing (more than 50% bought).....	290	46
Bakery bread	*537	86
Commercial laundry work.....	*247	39

* These figures include cases in which some was also done at home.

It is somewhat surprising to find nearly one half of the homes without running water and more than one half with outside toilets although so large a proportion had electric lights. It was not possible to secure accurate figures concerning the use of commercially canned goods. The majority bought a large amount of canned foods, frequently including milk, but 349, or 56 per cent, report home canning of varying amounts depending largely upon the quantities of fruit or vegetables available without cost.

Some of the most outstanding facts from this study seem to be the prevalence of gainful employment among homemakers in Washington County; the comparatively small effects of depression upon it in comparison with that of the men; and the important role which the women's earnings play in helping to carry the family through an emergency. It is also interesting to note that the reason given for working by 533 women was to secure necessities, although only 126 of the 624 cases studied had no man in the family.

Methods of Refrigeration in the Rural Rhode Island Home. This project has been completed and the results of the study published in Bulletin No. 239 entitled, "Home refrigeration methods in rural Rhode Island." All of the methods found in use in the state were studied, including springs, wells, and cellars. Tests of the temperatures maintained by these means showed that they gave very limited protection against bacterial change. Well constructed and properly iced refrigerators were kept at an average temperature of less than 50° F. which reduces bacterial growth so as to provide reasonable preservation. The mechanically cooled refrigerators can be adjusted to the desired temperature and this temperature maintained. The different models tested, including one operated by kerosene, were found reliable and satisfactory to the users. The chief differences to be considered were those of purchase and operation costs.

Food Habits of Rural Rhode Island School Children. About one hundred records of one week duration were kept by mothers in different parts of the state. These show the kinds and measured amounts of fruits, vegetables, and milk consumed by children of school age. The form in which the food was served was also recorded. To make the information as representative as possible a sec-

ond week's record at a different season of the year is being secured. In spite of the unavoidable reduction in the amount of milk under present financial conditions of some homes the average per capita allowance of the 97 already reported is 3-1/3 cups a day. As a reasonably standard means of measuring the general health of the children their school attendance record for the past year is secured. A further fact of practical interest is the cost of foods for the school child. This is estimated on the basis of local prices. The completed data will be compared with a standard which has been established as desirable by one or more national dietary authorities both in kinds, amounts, and costs of the food.

Poultry Husbandry

Coccidiosis. The study of chemicals and drugs which might have some therapeutic value against avian coccidiosis has been continued with negative results.

Several chemical agents were used to determine whether they had any value in preventing sporulation of oocysts. Among those which were of value were glycerin, guaicol, protargol, carbon disulphide and hydrofluoric acid.

Studies relating to the persistency of oocysts in soils were continued. Three different soil plots out of four under study showed survival of oocysts at four months following the removal of all birds from the plots. Two plots were positive at the end of six months. One of the two plots positive at the end of six months was found positive at the end of the ninth month. This positive plot was subsequently found negative at the end of a year.

Blackhead. The work this year has dealt with management phases; noting the rate of growth of turkeys reared on rotated range as compared with turkeys reared completely in confinement on wire porches and considering the difference of the two groups so far as blackhead disease was concerned. At the beginning, the range group of turkeys consisted of 41 poults, 33 of which survived to be placed on range. The confinement group consisted of 47 poults of which 35 survived to begin the experiment. The numbers of both groups were seriously reduced by dogs killing 16 of the birds on range while nine of

the confinement birds died from coccidiosis. Of the surviving birds of both groups, the average weight of the confinement group birds was 13.32 pounds as compared to 12.37 pounds for the range group at the end of the 25th week.

One bird from the confinement group died from blackhead while four of the range group contracted the infection and died.

The Effect of Different Calcium Intake Levels or Hatchability and Egg Shell Formation. Rations fed containing 0.24, 0.37, 0.66, and 1.05 per cent calcium in the mash were not conducive to normal hatchability or normal eggshell strength when compared to a pen receiving a 0.37 per cent calcium mash plus oyster shells *ad libitum*. All groups were fed grain in addition. The eggs from the higher calcium level group showed greater strength against breakage and had higher total calcium contents upon chemical analysis than the group receiving less calcium in their ration. Peculiarly, birds receiving all of the calcium carbonate finely ground in the mash, exhibited abnormal appetites for granite grit, which by the completion of the experimental period of 24 weeks resulted in a comparatively severe mechanical enteritis of the intestines.

Land Utilization

Information is being gathered by several departments of the station which, when pieced together, should give a picture of the present use of the land areas within the State. In addition to learning the present situation such information may be used to suggest uses which could be made of the land in the future to secure better economy.

The department of agronomy has cooperated with the U. S. D. A. Bureau of Soils in making a soil survey of the lands of Washington County. During the past year the field work of this survey has been completed and work was begun on the Kent County area. When this county is completed a detailed map and description of the soils of Washington and Kent counties will be published.

Further progress was made on securing data as to the present land cover in Washington County. One of the workers on this phase of the project submitted a thesis using this data in partial

fulfilment of the requirements for the degree of Master of Science. This material will give much interesting information particularly of forest stands, present uses of agricultural areas, and along with the data secured by the soil survey, should aid in drawing conclusions as to future uses of land.

Seventy farm business records were obtained by the survey method. In addition to the business record information was obtained on the type of road passing the farm, the distance to a hard-surfaced road, the distance to the principal markets, intentions regarding the use of land, and any proposed changes in the farm enterprises. It is the intention to repeat the farm business survey at least twice with a one-year interval between each two surveys. Analysis of these records will indicate the effect of the rapidly changing economic conditions upon farm income and will point to some of the ways in which farmers can reduce costs and make adjustments to these changes. These records provide the basis for studying some of the relationships between the type of farming and the soil type, and between farm returns and soil type.

In addition to the farm business records, notes have been taken on the uses of land by persons who do little or no farming. Some of these uses are: an all-year residence; a residence for the summer months only; a private reservation for fishing, hunting, and recreation; and, the holding of land for a speculative rise in price. These properties vary in size from homes with one acre or less to large holdings of 1,000 acres or more.

OTHER ACTIVITIES

Feed and Fertilizer Control Services

Feed Inspection. The results of this regulatory service are reported in the Annual Feed Circular dated May, 1933. Two hundred and twenty-two samples of commercial feeds were collected and analyzed. The same small percentage of serious failures to meet guarantees noted in recent years was again true. The appropriation of \$1,300 received from the State Legislature for this work is inadequate to permit of the collection and analysis of all the brands sold in the State. With a constantly increasing use of by-products in commercial feeds the law should be amended to require a guaranty for crude fiber and also to provide sufficient

funds for the collection and both the chemical and microscopical analysis of all brands sold in the State.

Fertilizer Inspection. The results of the analysis of 195 samples of fertilizers and fertilizer chemicals collected in 1933 are contained in the Annual Fertilizer Circular published September, 1933. This number of samples was the largest ever collected in the State and comprise 482 guaranties; 96 per cent. of the guaranties were fulfilled. A slightly smaller number of brands which contained more than 20 per cent plant food were found this year than in 1932. The 4-8-4, 4-8-7, and 5-8-7 brands were apparently used most extensively. Low grade fertilizers are high in cost of plant food and are usually lower in value delivered per dollar of cost.

Egg-Laying Contest

The third contest was brought to a successful close with average production records surpassing those of any of the preceding years. The following table shows the average production per bird and the average accumulated points for each of the three contests.

Contest	Eggs	Points
First.	186.97	187.99
Second.	208.18	214.51
Third.	210.27	215.66

On the basis of the records received, the Rhode Island contest finished the year in third place among the 17 standard contests operating in the United States.

The final results of tabulation show that the contest had the second highest Rhode Island Red pen record and the second highest Barred Plymouth Rock record in standard contests. It was additionally honored by having the highest individual bird records in the Jersey White Giant and Jersey Black Giant breeds.

During the year a total of seven birds eclipsed the 300-point mark with the leader producing 320 eggs with a total of 326.45 points.

Weather

The growing season of 1933 was favorable for early maturing crops. The last frost occurred on May 5 with a temperature of

31°*. A temperature of 22° was recorded on April 28. While this is a rather low temperature for this date it did not result in any serious injury. The average rainfall was 2.92 inches above normal for April and 1.99 inches below normal for May. The months of June and July were below normal in rainfall. This continued dry period undoubtedly retarded the development of crops. The month of May was below normal in temperature which resulted in slow germination and a retarded growth.

The month of August, because of the prevailing high humidity and rainfall, was very favorable for the development of certain fungus diseases. The harvest period of tomatoes was greatly reduced by blight which consequently resulted in decreased yields. Also, brownpatch developed rapidly on the grass plats causing considerable damage.

The month of September was 4.59 inches above normal in precipitation. The precipitation did not seem excessive because of the slight rainfall recorded the previous months.

The month of October was very fair with the first frost occurring on October 15. The fall was very mild permitting late fall seedings and allowing late crops a long period for growth.

The following table shows the departure from normal rainfall for the growing season:

Month	Normal Inches	1933 Inches	Departure Inches
April	4.71	7.63	+2.92
May	4.17	2.18	-1.99
June	3.33	2.15	-1.18
July	3.47	2.03	-1.44
August	4.31	5.08	+ .77
September	3.50	8.09	+4.59
October	4.18	2.87	-1.31

Publications

Inspection of feeds. Annual Feed Circular, May, 1933. 12 p.
Report on high analysis fertilizer. Jour. Assoc. Off. Agr. Chem. 16; 220-223.

* Climatological Date, New England Section of the U. S. Department of Agriculture Weather Bureau.

The effect of certain crops on succeeding crops. Jour. Amer. Soc. Agron. 25: 612-618.

Forty-fifth annual report of the director. Bul. of Rhode Island State College 27: 40-62.

The relative response of potatoes to different fertilizer elements. Amer. Potato Journal 10: 27-31.

Investigations regarding bluegrass webworms in turf. Jour. Econ. Ent. 26: 1117-1125.

The common house fly (*Musca domestica*) as other than a simple mechanical carrier of avian coccidia. Poultry Science 12: 390-391.

Caecal Abligation of turkeys by the use of clamps in preventing Enterohepatitis (Blackhead) infections. Jour. Amer. Vet. Med. Assoc. 83: 238-246.

A preliminary report of an apparently new respiratory disease of chickens. Jour. Amer. Vet. Med. Assoc. 82: 772-774.

The quantitative microanalysis of plant juice for reducing sugars and sucrose. Jour. Biol. Chem. 102: 29-34.

The efficacy of pigeon pox vaccine in the vaccination of chickens against fowl pox. R. I. Agr. Expt. Sta. Bul. 238, 8 p.

Home refrigeration methods in rural Rhode Island. R. I. Agr. Expt. Sta. Bul. 239, 19 p.

A study of consumers' preferences and practices in buying and using eggs. R. I. Agr. Expt. Sta. Bul. 240, 44 p.

Inspection of fertilizers. Annual Fertilizer Circular, September, 1933, 19 p.

Respectfully submitted,

BASIL E. GILBERT,

Director of Research.

Kingston, R. I.

January 1, 1934.

RHODE ISLAND STATE COLLEGE
REPORT OF
THE EXTENSION SERVICE
1933

PRESIDENT RAYMOND G. BRESSLER,
*Rhode Island State College,
Kingston, Rhode Island.*

SIR:

Herewith I am submitting as by law required the annual report of the Extension Service of the Rhode Island State College for the year 1933 as carried on in cooperation with the United States Department of Agriculture and the three Rhode Island Farm Bureaus. This report is the thirty-second report of agricultural extension work in Rhode Island.

The continued economic depression, together with constantly decreasing farm incomes has materially increased the problems of our rural people and multiplied the requests for assistance in solving the new problems which are constantly arising in connection with the operations of the farm and conduct of the home. The past year has seen the financial situation of our farm people become more serious due to the decrease in prices received for the products of the farm and increase in production costs largely due to rising feed prices. Especially true is this of the dairy and poultry products. As a result of these conditions more attention has been given to changes in the farm business which would reduce production costs and improve the general farm management set-up.

With reduced spending power farm people were not able to finance entertainment projects as in previous years. It therefore became necessary to place more emphasis upon community affairs, home-made recreation and home improvement.

Lack of cash to use for purchases of food has increasingly emphasized the need of making the farm supply a much greater share of the family subsistence through the use of more milk and poultry products in the home, together with greater attention to the home vegetable and fruit gardens. Many people who have been indifferent to the suggestions of extension workers in the past have

gladly listened to recommendations made and are becoming active supporters of the work. Less difficulty has been experienced in finding local leaders with better training than in years past. Without the assistance which has been so freely given by these leaders much less would have been accomplished by the paid workers of the Extension Service.

Cooperation.

During the past year there has been the finest spirit of cooperation shown on the part of all the agricultural organizations in the State, public service companies and many other organizations. Assistance has been rendered in program development, furnishing demonstrators and demonstration equipment, giving the use of halls for meetings and in many other ways.

The National Recreation Association donated the services and expenses of Mr. John Bradford for two weeks in the early fall for the purpose of organizing and conducting two recreational leadership training institutes. This association also made it possible to have the very valuable assistance of Mr. A. D. Zanzig at our State 4-H Club Camp. More than one hundred individuals sent as delegates from Farm Bureaus, Granges, Parent-Teacher Associations, Boy Scouts, American Legion and Churches received the training in recreational leadership at the institutes. Those who attended the institutes have formed two permanent organizations for continuing the work. Representatives from the different organizations will act as recreational leaders in their own groups. Plans are already under way for continuing these recreational leadership institutes during the coming year.

All of the radio broadcasting stations in the State have cooperated by giving time for emergency announcements and notices of special events. The regular broadcasting service inaugurated in 1931 over Station WJAR maintained by the Outlet Company in Providence has been continued throughout the year. A total of 312 broadcasts were given.

Sources of Revenue.

The income for the fiscal year ending June 30, 1933, as reported

to the United States Department of Agriculture comprised the following items:

Federal Capper-Ketcham Funds	\$20,481.84
Federal Smith-Lever Funds	14,432.89
State Smith-Lever Offset.....	1,680.24
United States Department of Agriculture funds allotted to Rhode Island and paid direct from Federal Treasury:	
County Agent Work.....	\$2,610.00
Home Demonstration Work.....	2,160.00
Boys' and Girls' Club Work.....	1,880.00
Total	\$6,650.00

The State appropriation of \$6,500 as by law required was made to the three local Farm Bureaus and in all cases was matched by local appropriations and donations.

Personnel.

There were no changes in personnel during the fiscal year ending June, 1933.

During the year covered by the report, E. P. Christopher, Fruit Specialist, was on leave of absence for study at Cornell University for a period of ten months. J. E. Ladd, Animal Husbandry Specialist, was granted absence for professional improvement for a period of four months.

Publications.

- During the year two bulletins and one circular have been published.
- Bulletin No. 62, Poultry House Construction by H. O. Stuart and C. P. Hart. March, 1933.
- Bulletin No. 63, Annual Report of the Extension Service 1932, by G. E. Adams. April, 1933.
- Circular No. 7, Spray Program for Apples (revised) by E. P. Christopher. March, 1933.

Effectiveness of Extension Work in Reaching Rural People.

A survey of 408 farm and 166 non-farm homes was conducted in March, 1933, under the direction of Mr. M. C. Wilson of the Federal Extension Service for the purpose of determining the effectiveness of the Extension Service in reaching rural people. In order to obtain a true picture of the situation areas were surveyed

in each of the three farm bureau districts of the State. Every rural home in the area selected was visited. The homes not on farms were included so as to more effectively determine the influence of the home demonstration and 4-H Club work in rural communities. It was also felt that the county agricultural agent was exerting a considerable influence upon the garden operations of those people who were living in the rural communities and working in town. Of the 574 homes visited 382 or 66.6 per cent had personal contacts with some paid extension worker. As a result of information received, 61 per cent or 350 had adopted one or more new practices. In answer to the question as to whether the individuals were favorable, indifferent or opposed to extension the replies showed 79.1 per cent favorable and 1 per cent opposed to agricultural work. Home economics: favorable, 75.5 per cent, opposed .3 per cent. Club work 78.6 per cent favorable and .2 per cent opposed.

The following table shows the distribution of the homes, number in family and other interesting data.

Farm and Home Study, March, 1933
General Information

	Farm		Non-farm		Total	
	No.	Per cent or Average	No.	Per cent or Average	No.	Per cent or Average
Number of records.....	408	71.1	166	28.9	574	100.0
Owners.	369	90.4	118	71.1	487	84.8
Tenants.	39	9.6	48	28.9	87	15.2
Years living on this place, average.		17.0		11.0		15.2
Roads:						
Improved.	248	60.8	116	69.9	364	63.4
Unimproved.	160	39.2	50	30.1	210	36.4
Number in family:						
Adults.	1,187	2.9	423	2.5	1,610	2.8
Families with children under 10.	131	32.1	84	50.6	215	37.4
Children under 10.....	272	2.1	165	2.0	437	2.0
Families with children 10 to 20.	175	42.9	68	41.0	243	42.3
Children 10 to 20.....	414	2.4	152	2.2	566	2.3

Homes with telephone.....	275	64.4	81	48.8	356	62.0
Homes with radio.....	336	82.4	137	82.5	473	82.4
Per cent taking daily paper....	343	84.1	141	84.9	484	84.3
Per cent taking farm paper....	315	77.2	75	45.2	390	67.9
Per cent taking farm home magazine.	183	44.8	67	40.4	250	43.6

Comparison with a similar survey made in the same area five years previously shows the number taking daily papers was 3 per cent more, the number taking home magazines 3.2 per cent more. The number taking farm papers, however, has decreased 16.8 per cent during the five-year period.

The question is often asked, "What methods used by county agents have the greatest influence on the adoption of improved practices?" The following table gives an answer to this question as the work is conducted in Rhode Island:

Methods Influencing the Adoption of Improved Practices

	Farm		Non-farm		Total*	
	No.	Per cent	No.	Per cent	No.	Per cent
Total practices adopted.....	919	85.9	151	14.1	1,070	100.0
Method demonstration	361	39.3	63	41.7	424	39.6
Farm visit	354	38.5	33	21.8	387	36.2
Circular letters	262	28.5	33	21.8	295	27.6
Meeting.	167	18.2	24	15.9	191	17.8
Junior result demonstration....	34	3.7	7	4.6	41	3.8
Bulletin.	29	3.2	10	6.6	39	3.6
Adult result demonstration....	32	3.5			32	3.5
Correspondence.	15	1.6	1	0.7	16	1.5
Office call	21	2.3	6	4.0	27	2.5
Telephone.	4	0.4	1	0.7	5	0.5
Leader training	2	0.2	6	4.0	8	0.7
News stories	3	0.3			3	0.3
Extension school	12	1.3			12	1.3
Radio.	12	1.3	14	9.3	26	2.4
Exhibit Poster						
Indirect.	20	2.2	8	5.3	28	2.6

* The column "per cent of influence of different practices" will total more than 100 per cent as frequently several methods have exerted an influence on change of practice.

Of these seventeen methods used by our workers in extension teaching it was found that four were responsible, in part at least, for a large majority of the changed practices. In comparing the data in the above table it should be borne in mind that several different methods may influence the adoption of a single practice. For example, an individual may be induced to start pasture improvement work through visit to a result demonstration, circular letters, bulletin and farm visit from his county agent.

Agent Work within the Counties.

The following table summarizes the general activities of the nine agents who have been maintained in the counties during the past year:

Total number of farm visits.....	2,872
Number of different farms visited.....	1,106
Total number of home visits.....	1,645
Number of different homes visited.....	887
Number of calls relating to extension work:	
Office.	1,917
Telephone.	2,740
Number of days agents spent in office.....	1,098
Number of days agents spent in field.....	1,459
Number of news articles published.....	385
Number of individual letters written.....	6,760
Number of different circular letters prepared.....	485
Number of radio talks made.....	312
Meetings held	2,177
Number of 4-H Clubs	179
Number of different 4-H Club members enrolled:	
Boys.	1,058
Girls.	1,616
Number of different 4-H Club members completing:	
Boys.	830
Girls.	1,381

County Agriculture Agents.

As a result of the changing financial conditions of our farmers the agents have been obliged to devote considerable time to what may be called emergency work. Under this head there would be included assistance rendered farmers in filling out the forms necessary in order to secure loans from the Farm Credit Administration.

including Land Bank loans and Production Credit loans. Assistance in refinancing farm mortgages, in debt consolidation in order that the farmers could refinance their business by Commissioner's loans. Subsistence gardening and home gardening projects with the unemployed in villages and cities and assistance in connection with the production of more of the family living from the farm.

The agents have been active in increasing the dairy herd improvement work. With increased cost of purchased feed continued emphasis has been placed upon the pasture improvement work. The result demonstrations have shown that the normal pasture season can be increased from nine to twenty-seven days in the early part of the season by proper fertilization. The top-dressing of good pasture sod with complete chemical fertilizers has lengthened the grazing season and reduced the cost of producing 100 pounds of milk as compared with barn feeding very materially.

Poultry. With the increased costs of producing poultry products and the decreased prices received for the same, increased emphasis has been placed upon the necessity for disease control and retaining in the flock only the high producing birds. That the problem of the boarder hen may be as serious a handicap to the profits in the poultry business as the boarder cow in the dairy herd is shown by the results obtained from a culling demonstration in a farm flock of sixty-five birds. At a culling demonstration thirty-five culls were removed, leaving thirty good birds. The day after the demonstration the good birds laid twenty-five eggs. For a period of one week following, the thirty-five culls did not produce a single egg, at the end of which time they were sold.

Vegetables. As the result of a series of meetings at which fertilizer problems were discussed, a group of Italian market gardeners pooled their orders for approximately 200 tons of 5-8-7 fertilizer, which enabled them to obtain this fertilizer at a saving of \$7.50 per ton or a total of \$1,500.

Home Demonstration Work.

As a result of a decrease in the cash available for use in purchasing those things necessary for the home, special emphasis has been placed by the home demonstration workers upon a live-at-

home program. Realizing that it would not be advisable to recommend any changes about the house that would mean a very large outlay of money at the present time, the program has been developed along the line of using those materials which are available on the farm and in the home in so far as possible.

Emphasis has been placed upon food preservation, clothing and the home furnishings parts of the program. Special emphasis was placed upon the last two phases mentioned as it was felt that nothing tends to maintain morale more than a good personal appearance and an attractive home. More housewives have reported the use of the clothing budget than ever before. Many articles of clothing were renovated and remade. One agent urged the home demonstration groups in her territory to make as much use as possible of the sugar and grain bags which came to the farm. The list of articles made include 207 pairs of curtains, 156 pairs pillow slips, 448 holders, 19 quilts, 255 dish towels, 33 stringholders, 61 sheets, 2 bedspreads, 588 aprons, 183 luncheon sets, all made from grain bags. In addition, one or more women reported having made the following articles: men's shirts dyed blue, men's shorts, women's dresses, both white and colored, parasol, summer hat, towels, quilts, comforters, pajamas, negligees, laundry bags, garment covers, shoe bags. The strings from the bags were crocheted and knitted into holders, doilies and the like.

As the live-at-home program calls for more of the housewife's time being spent in the kitchen 278 women were assisted in rearranging the kitchens.

Home gardens were developed and many jars of food canned from the surplus which could not be used in the fresh state.

The local leader training schools still continue to be the most effective method of obtaining rapid spread of practice in the home demonstration work.

Boys' and Girls' Club Work.

During the past five years the average size of project carried on by members of the 4-H Clubs has more than doubled. During the past year many of these projects have been of material aid in furnishing support for some of the members' families. In several cases the income from club projects has been the sole source of

cash income of the family for part of the year, due either to illness of the parents or to their having lost their positions as a result of the depression.

The State 4-H Camp had the largest enrollment of any year since its inauguration. Those registered for the entire week included 380 members and 41 club leaders, with approximately 200 other leaders present for one or more days. Two of the outstanding features at the camp were the music appreciation work conducted by Mr. A. D. Zanzig of the National Recreation Association and the dramatic work by Mrs. L. W. Telford.

The following table presents the progress for the past year.

Progress in 4-H Club Work, December 1, 1933

	1932	1933
Prompt submission of plans of work, written, before November 1	77	127
Prompt reorganization and enrollment, members, before November 1	1,817	1,885
Number of project completions.....	3,387	4,228
Quality of completions. Meeting honor standards.....	1,058	2,211
Number of 4-H clubs meeting honor standards.....	88	106
Increase in older members. Number 16-20 years.....	302	386
Number of adult men leaders.....	38	40
Number of men assistant leaders.....	23	48
Number of adult women leaders.....	127	119
Number of women assistant leaders.....	92	106
Total enrollment.	2,357	2,674
Total clubs.	171	179
Total boys.	890	1,467
Total girls.	1,058	1,616

Agricultural Economics.

The field work in connection with the cost of milk production study which was started on February 1, 1932, was finished January 31, 1933. This study showed that in 38 herds containing 740 cows, with an average production of 7,419 pounds of milk per cow, the cost of producing a quart of milk was \$0.056. The results of this study have been tabulated and are soon to be published as an experiment station bulletin.

With the development of the program of the Federal Government for the relief of the agricultural depression, an increased demand was made for information in connection with the new policies, especially as related to farm credit. During the latter part of the year, work in connection with the Agricultural Adjustment Administration has taken a major portion of the economists' time.

At the second Farm and Home Conference held in the Northern and Southern Rhode Island Farm Bureau districts, there was developed a schedule of receipts and expenses which might be expected from a dairy farm in 1933, somewhat larger than the average for the State.

The following tables show the results as worked out by the groups present at these meetings:

Southern Rhode Island

	30-cow farm	15-cow farm
Management of Overhead	Per cow	Per cow
D—epreciation.	\$6.00	\$12.00
I—nterest.	4.00	8.00
R—epairs.	4.00	8.00
T—axes.	6.60	12.00
I—nsurance.	3.00	6.00
Total per cow.....	\$23.60	\$46.00

Estimated Cash Receipts and Cash Expenses Per Cow Which May Be Expected on a Dairy Farm in 1933

	Northern Rhode Island A 30-cow farm Per cow	Southern Rhode Island A 30-cow farm Per cow
Cash Receipts:		
Fluid milk	\$119.00	\$109.00
Surplus milk	3.25	4.00
Calves.	1.50	1.50
Cows, etc.	5.00	4.00
Total.	\$128.75	\$118.50

Cash Expenses:		
Grain.	\$32.00	\$31.25
Hay, etc.	6.50	14.00
Corn silage	2.40	3.25
Cows bought	19.00	20.00
Payment, money owed.	0	0
Insurance.	3.00	3.00
Repairs:		
Buildings.	} 2.00	4.00
Equipment.		
Taxes.	6.00	6.60
Interest, money owed.	3.00	4.00
Other costs	17.00	10.00
<hr/>		
Total.	\$90.90	\$96.10
Cash for family living.	\$1,135.00	\$660.00

After these meetings statements were made by many of those in attendance that this type of meeting was the most instructive which they had ever attended.

Agronomy.

With the continued decrease in receipts from the sale of milk, accompanied by an increase in the price of purchased grains, it is becoming increasingly important that more of the feed consumed on the dairy farms of Rhode Island be produced at home. Emphasis has been placed upon two phases of the program for the reduction of feed costs: one, improved quality of hay by earlier cutting and by growing a higher percentage of legumes; two, pasture improvement with special emphasis on fertilization of good pasture sods to produce earlier and more continuous grazing throughout the pasture season. As a result of the first phase of the work, one of the county agents obtained records showing changes in cropping methods from a hay acreage composed almost entirely of timothy and red top to methods whereby more legumes and annual hay crops have been grown, which has increased the value of the hay crops on the farms reporting in 1933 by at least \$45,000, when using a value of 6.4c per pound for the crude protein.

The pasture fertilization work has continued to show the value of this practice in reducing feed cost of milk production. Accurate records from four farms for the six-months' period from May 1 to Oc-

tober 31, 1933 showed a range in feed cost per 100 pounds of milk produced, of from 72c to \$1.06. The lowest feed cost was 44c per hundred weight of milk for the months of May and June, which figure was attained by one of the cooperators.

Many questions have been received asking for advice in connection with the most economical purchases of lime and fertilizer. A large number of these inquiries have been accompanied by samples of soil to be tested for calcium and phosphorus. A growing interest is being shown in connection with the study of magnesium deficiency in many of our Rhode Island soils as it influences the yields of corn and potatoes.

Animal Industry.

The dairy herd improvement association work has been maintained during the past year with two active associations, one in Northern Rhode Island and the other in Southern Rhode Island, with a third association organized in Eastern Rhode Island and ready to commence testing work early in January, 1934.

From the second year's records of these associations some interesting figures are shown in the following table:

Relation of Time of Freshening to Other Factors

Season	No. of Cows	Average Lbs. Milk	Average Lbs. Butterfat	Average Feed Cost	Average Income Over Feed Cost
Winter	167	8,106	301	\$118.00	\$220.00
Spring	170	8,213	308	119.00	241.00
Summer	215	7,052	278	111.00	203.00
Fall	129	7,493	291	114.00	217.00

Winter and spring freshening is the most favorable time in Rhode Island. This is rather unusual, for on an average for all States, dairy herd improvement association records show that fall and winter freshening always has the advantage.

Frequently the question is asked, "At what age is the peak of production reached?" A study of the records of 394 pure bred cows, on test, with ages ranging from two to sixteen years, shows the peak of production to have been reached at about the age of seven years. The average production of these animals was 7,850 pounds of milk containing 295 pounds of butterfat. Three hundred twenty-six grade

animals showed an age range of from two to fourteen years, with a peak production at about seven years. This group produced 7,576 pounds of milk on the average and 293 pounds of butterfat.

Fifty-six farmers have purchased better bulls and an increasing number are raising their replacements, believing that even though it may cost slightly more to raise an animal than to buy one, the increase in cost is good insurance against the introduction of disease into the herd. Improved methods of feeding, with a rapidly increasing tendency to depend upon more home grown protein, as a source of that most expensive portion of the ration, has been very evident during the past year as reflected in the type of inquiry received in relation to feeding practices.

Fruit Growing.

As the Fruit Specialist has been on leave of absence for professional improvement during the greater part of the past year, there has been a relatively small amount of work in connection with this project. The spray service was maintained with the hearty cooperation of the county agents, with 179 fruit growers enrolled, who own nearly 40 per cent of the commercially productive apple trees in the State. Information as to time of and kind of spray was broadcast over the radio just previous to the time for application of the sprays. Postal card notices were mailed to all of those who were enrolled. At the end of the season a check-up of the injury caused by disease and insect pests showed scab to be the most important of the diseases and the curculio as the insect causing the greatest amount of damage. Wherever the sanitation and spray programs of the Extension Service have been followed in detail both of these pests were effectively controlled.

Several demonstrations of methods of grafting and pruning were conducted by the county agents.

Poultry.

Early in the year the poultry program was re-written and the program divided into three parts: (1) The chicks, (2) The young stock on range, (3) The laying and breeding stock. Reports from 113 poultrymen enrolled to follow the Productive Poultry Practices Program who had 122,647 birds show the following numbers as having fol-

lowed the practices recommended in Parts I and II of the revised program.

Results of the Productive Poultry Practices Program for 1933

No. poultrymen enrolled	263
No. chicks enrolled	228,177
No. poultrymen reporting	113
No. chicks reported	122,647

No. following each practice:

Part I—The Chicks

No. secured tested stock.....	85
No. followed five to seven day cleaning.....	87
No. placing chicks on clean land.....	71
No. hopper feeding all feed.....	83

Part II—The Young Stock on Range

No. using clean range.....	68
No. using shelters with wire floors.....	32
No. culling pullets when placed on range.....	59
No. that placed not more than 500 pullets to the acre.....	49
No. hopper feeding pullets on range.....	83
No. who rotated feed hoppers.....	63
No. who fenced range.....	69
No. who vaccinated the pullets.....	30
No. who checked up on disease.....	60

The following table shows the progress made in disease control during the seven years of the Grow Healthy Chicks Campaign:

Grow Healthy Chicks Plan

Summary of Statistics Showing Decrease in Mortality in Percentages for Past 7 Years

	1927	1928	1929	1930	1931	1932	1933
Mortality in untested stock.....	30.0	26.1	20.5	17.4	12.7	13.6	10.9
Mortality in B. W. D. tested							
stock	11.5	10.3	8.6	8.3	5.4	4.3	4.1
Average mortality of all flocks.	18.1	17.6	18.3	11.8	7.6	5.4	4.8
Mortality where one or more							
details of plan were omitted..	20.0	20.4	24.3	14.9	8.5	5.6	5.5
Mortality where all details of							
plan were followed.....	11.0	9.0	8.0	7.4	5.7	4.8	2.9