1932

Annual Report 1932

University of Rhode Island

Bulletin of Rhode Island State College

VOL. XXVII NO. 4 FOR FEBRUARY, 1932

REPORT OF THE BOARD OF MANAGERS

KINGSTON, R. I.

1932

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

ENTERED AT KINGSTON, RHODE ISLAND, AS SECOND CLASS MATTER

Frank A. Chapman, Printer - Providence, R. I.

RHODE ISLAND STATE COLLEGE

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REPORT

To His Excellency Norman S. Case, Governor, and the Honorable General Assembly of the State of Rhode Island and Providence Plantations, at its January Session, 1932.

I have the honor to submit herewith the Forty-fourth 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

Gentlemen:

I have the honor to submit my first annual report as President of The Rhode Island State College.

The year 1931 marks the beginning of a new administration of the college. The results of the year's work have been gratifying. The forces set in motion looking forward to a better program, the apparent interest of the people of the state in the affairs of the college, the sympathetic attitude of the responsible officials of the state, the active cooperation of the alumni and students, and the expressed confidence of the Board of Managers all conspire to make the future of the Rhode Island State College look bright indeed.

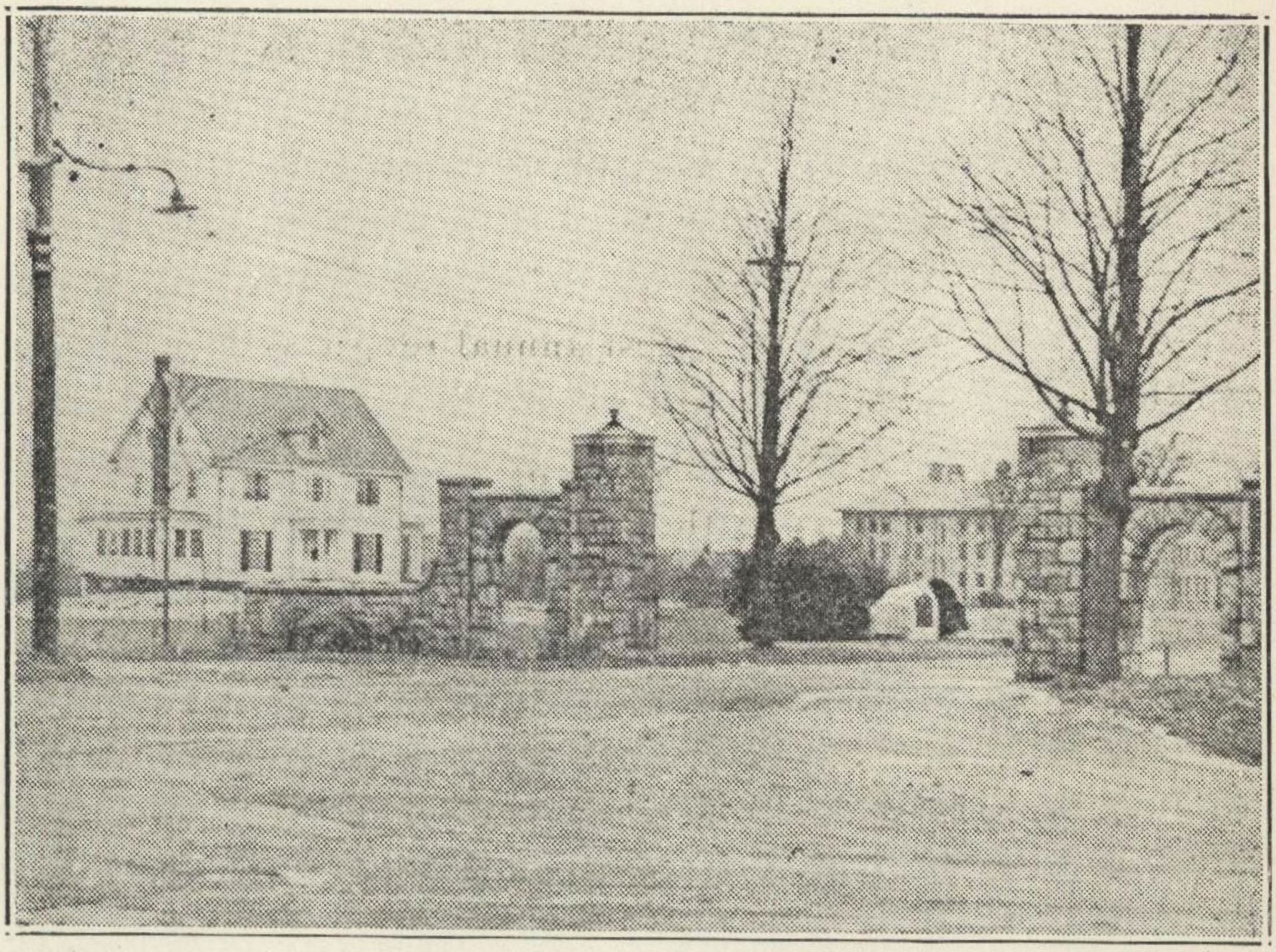
Numerous changes have taken place during the year. The enrollment has been increased by 152 students; new roads built; ten new members added to the teaching and research staff; four new buildings erected; programs set up looking toward improved campus conditions, physical, social and intellectual; dining halls reorganized; and beginnings made in placing greater administrative and fiscal responsibilities on the deans of the Schools.

The budget of the college is in a wholesome condition. Because of the improved purchasing power of the dollar, the college has been able to carry an enlarged program without reducing in any way the character of service rendered to the state.

A survey of the accomplishments of the year follows:

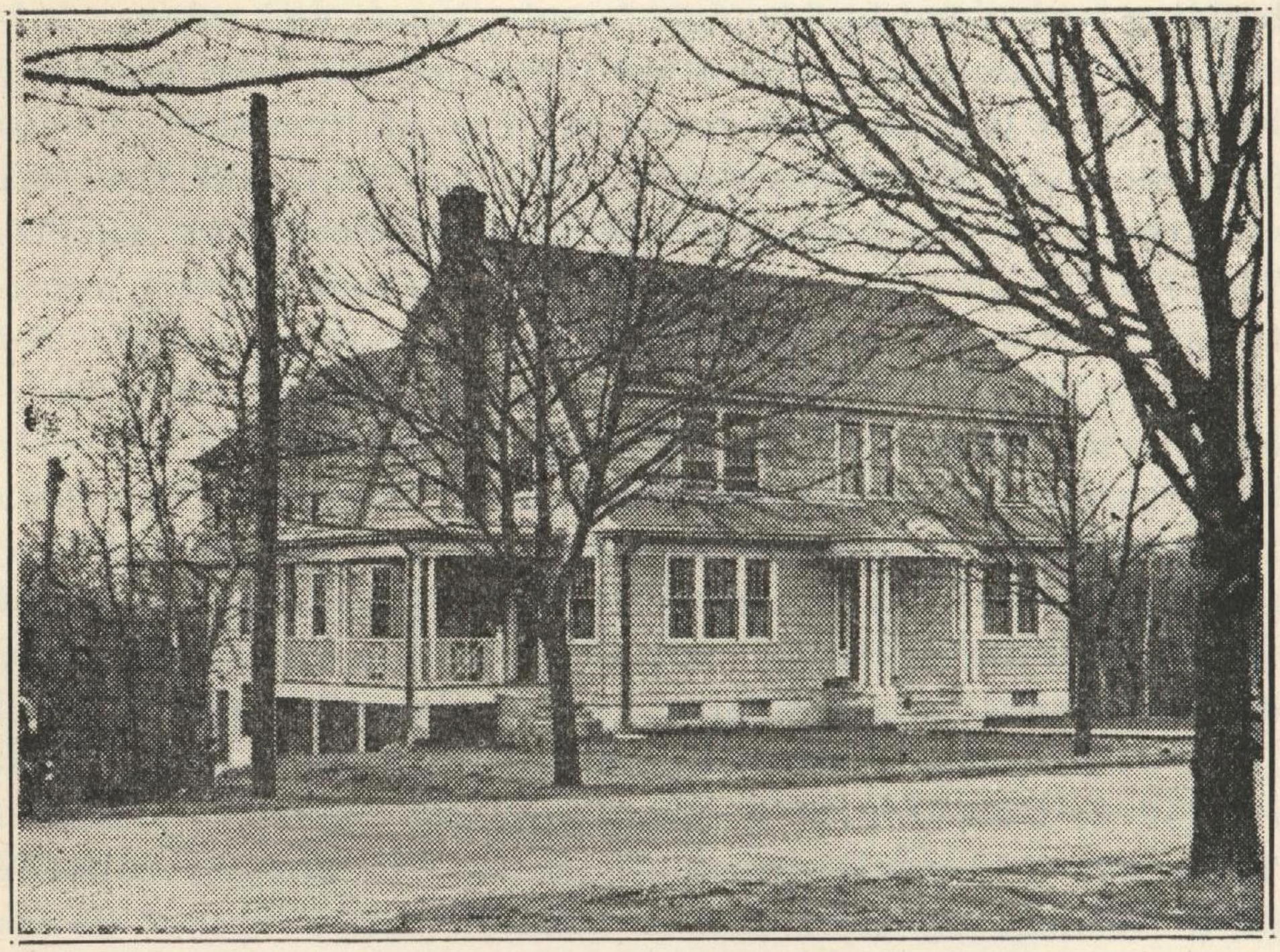
New Buildings

During the year there were four new houses erected on the campus. The President's house, which is located approximately 500 feet diagonally to the left of the college gates, is an imposing structure and is the first building to attract the eye of the visitor as he approaches the college. It is an eighteen-room

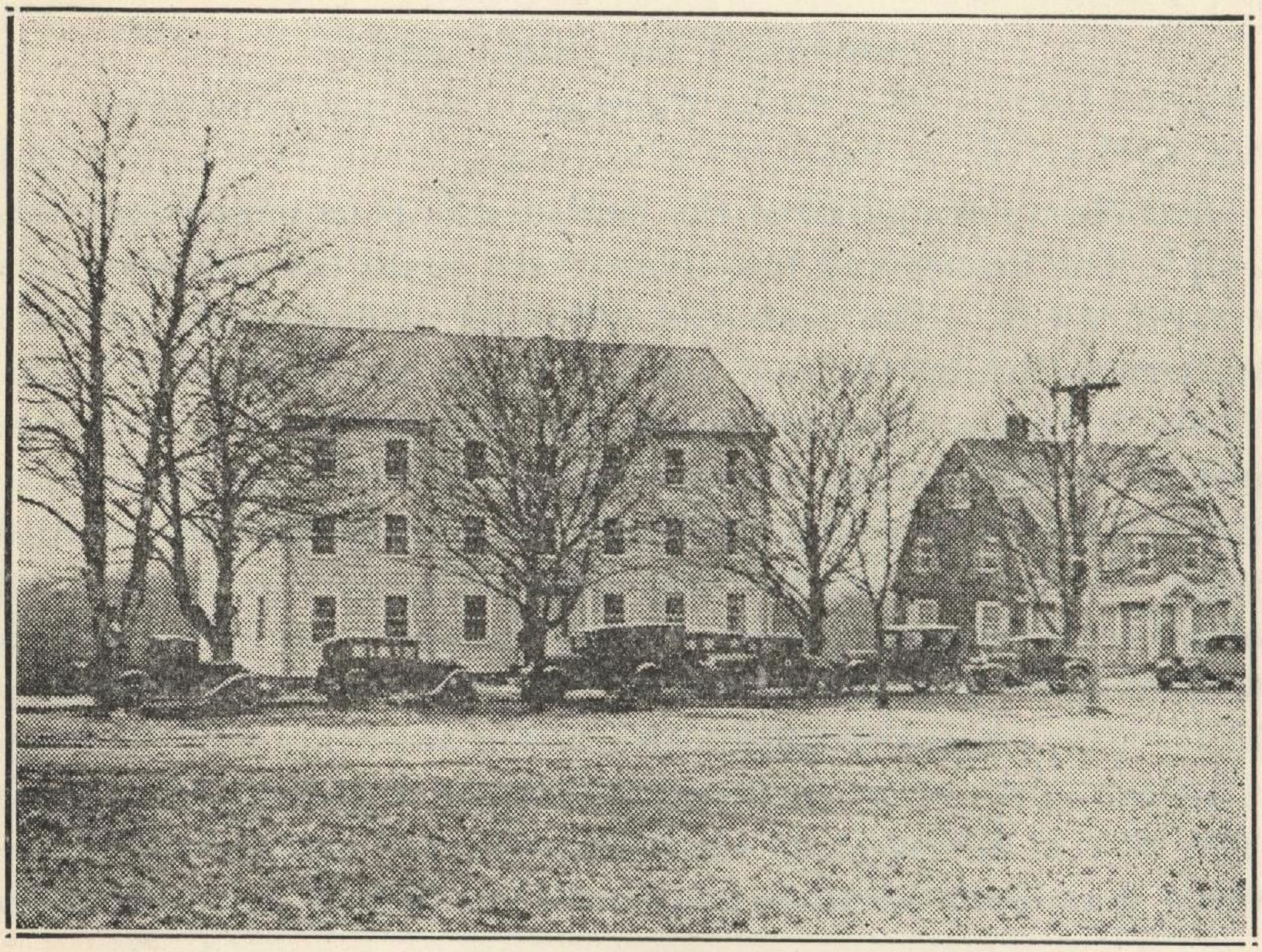


PRESIDENT'S HOUSE

ALPHA EPSILON PI



PHI MU DELTA



DELTA ZETA

building with a finished lounge, laundry room, and two-car garage in the basement. The other three buildings are fraternity houses, each one of which has a capacity of from thirty-five to forty students. The Alpha Epsilon Pi is a striking edifice of brick construction located on the southwest corner of the campus. The Phi Mu Delta is a frame building located directly across the street from Alpha Epsilon Pi, on the southern rim of what was once an arboretum. It has a very delightful setting overlooking the plains. There are many features to this home for boys that are well worth copying in other buildings. The Delta Zeta sorority is an attractive clapboard and shingle building, colonial in style, and is located between the Practice House and the Sigma Kappa sorority. It is the largest of the three sorority houses, and will be ready for occupancy about February 1, 1932. Each building cost in the neighborhood of $20,000 with the exception of Phi Mu Delta which reached a total of $25,000. These new fraternities increased the student carrying capacity of the college by more than a hundred and were one of the factors which enabled the college to admit a freshman class of more than 300 boys and girls.

Campus

A clean-up campaign of the campus has been under way since July. The bushes and brambles of the south campus have been cleared away. The real reason for its being more or less a wilderness during the past years is becoming manifest. Rocks! There are more rocks on one special half acre of this area than can be found in almost any other place in the South County. But a virtue will be made of these dolomites. It is proposed to make of this an attractive rock garden, plant therein a variety of plants adaptable to rocky conditions, and use the whole for instructional purposes in courses in landscape gardening and the like. The ornamental horticulturists of the State will cooperate with the administration in beautifying this part of the campus. The rest of the area of approximately ten acres, with two or three mammoth boulders preserved for effect, will be cleared

of the rocks with the expectation of making additional recreation space available for the students. Two athletic fields and a dozen or more tennis courts can very well be located here. Since there is little money available for work, more time will have to be taken than was anticipated last summer.

Roads

The State Board of Public Roads is gradually taking over the roads of the college. During 1931 a hard-surfaced macadam road was constructed from the college gates to the corner of Agricultural Hall, thence west to South Hall to meet another hard-surfaced road that was built from the main highway to the brook near the old Watson House. This road-building by the Board as the instrument of the State has been of infinite help to the college. In the course of a few years it is confidently expected to have first-class roads over the entire college property. What a saving in both energy and money this will mean ultimately to the college! The highway personnel is trained in road construction and can handle our road problem far more effectively than can any other agency.

Heat, Light, and Telephone

By supplementing the state appropriation by several hundred dollars the heat line not only was extended to Davis Hall but also was continued to South Hall, thus ridding the occupants of these two dormitories of annoyance from fumes, gases, and dust that persistently came from the furnace rooms. It has been a measure of economy to the college in that the two men who were used to fire these furnaces are being employed more profitably elsewhere. Heat likewise has been extended from Ranger Hall to the President's house, and from South Hall to the new Delta Zeta sorority. The Delta Zeta girls by saving the seventeen dollars a month which the other sororities pay for the services of the fireman, will pay the cost of this extension in three years. It would seem to be a wise policy to extend central heat to all the fraternities within the present heat extension area.

The central line from Lippitt to Ranger Halls is in very poor condition, and shall have to be replaced next summer. An item

for this has been included in the 1932 request to the legislature.

The old light and telegraph poles from Edwards Hall to the college gates had to be replaced during the summer. Sometime within the next five or ten years all overhead wires should be replaced with under-ground conduits. This would make the service more efficient and rid the campus of some very unsightly poles.

A second telephone trunk line was installed early in December. This has improved the outside service immeasurably.

Poultry Plant

For a great many years the college has maintained two poultry plants—one for research work and the other for instructional and commercial purposes. Because of the overhead cost in operating two plants they have generally been a liability to the college rather than an asset. In the hope that the poultry projects of the college may at least break even financially, the two plants have been merged and located at the East Farm—The Experiment Station farm. All the old buildings in "chickenville" have been removed. The hen houses that are worth moving will ultimately be located at the East Farm. The incubator house has been remodeled as a dwelling at the cost of approximately $300 and is being rented to one of the herdsmen at the rental of ten dollars a month. There are two other buildings remaining at the old plant which might very well be converted into dwellings for laborers of the college. One of the two wings of the old barn that have stood since the burning of the barn was torn down and the lumber salvaged for future use. It is the expectation that during the year 1932 the other wing will be taken away. By these removals and the cleaning up of the college poultry plant the gymnasium has been given a much better setting, and a large parking place made available.

Watson House

One of the misfortunes of the year was the gutting of the Watson House by fire. Because of the sentimental value to the alumni of this old structure on the campus, it would seem desirable to make some effort to preserve the exterior of this

building. With an expenditure of approximately $2500 all the inside walls might be removed and the house converted into a general meeting place for students, or a museum. The outside walls are in fair condition. There are possibilities here, but money is the present handicap. The house will be left standing very much as it is at present for a year or two, or until some good suggestion comes along for its ultimate disposal.

Dining Halls

One of the most significant changes made during the year was the converting of East Hall into a cafeteria with two fully equipped dining halls and a soda fountain and short-order counter. South Hall was converted from a restaurant into a table d'hote service. From reports received from the alumni, from a study of the report made in 1928 by a committee appointed by President Edwards, and from protests made to the new president personally by the students of the college concerning East Hall, it was concluded that the only reasonable chance the college had of being relieved of the continued criticism of the dining hall service was to bring about a decided reorganization. It was found that the same complaints that were made at the present time had been made many times over and in all probability would continue to be made as long as the college maintained compulsory eating at its own halls. With all these things in mind the Department of Home Economics, which is certainly the logical agency to look to for help in dining hall difficulties, was placed in charge of all the eating facilities of the college. A committee consisting of Miss Whittemore, Miss Stillman, Mr. Whalen, Chef Stowell, and the President was appointed to work out details of operation. The first arrangement proved unsatisfactory. The Chef did not feel that he could continue his services with the college under the new regime, and he therefore resigned on September 20. He was asked to reconsider his resignation and was allowed until October 1 to decide finally. At the meeting of the Board of Trustees in October, since nothing further had been heard from the Chef, his resignation was accepted.

The cafeteria is now operating on a cost-plus-five-per-cent-of-

gross-receipts basis. At the time of this annual report East Hall seems to be getting along all right. South Hall, however, because of the smaller patronage, is scarcely breaking even. In this connection I should say that students are no longer compelled to eat at the college commons. Everyone is free to eat at any one of the eating places on or off the campus. It is urged, however, that the girls of the two lower classes eat on the campus but this is not compulsory.

It was made very clear in the beginning of the semester that there would be free and open competition. The students were urged to watch the various eating places and shop around for bargains. This, of course, makes it more difficult for the managers of the various restaurants, but it does put them on their mettle. The students, who after all are the ones to be satisfied, are the gainers thereby. No criticism concerning the service has been made since the first of October. On the other hand there have been many approvals of the change. And best of all the college has shifted the criticism. Rumor is afloat now that the eating places off the campus were doing a more profitable business when the college had more or less a monopoly on the business.

The philosophy of the new set-up is this: if the college is engaged in a business enterprise, it should be on the same basis as any legitimate business, and not be subsidized or protected by regulations or by a monopoly. The function of the college is educational. It would be a tremendous relief to the institution if it could be rid of all dining room service. The necessity, however, of protecting the students from unreasonably high prices that might be asked were this phase of the college business entirely in the hands of commercial interests, is always present. Operating a dining hall should be viewed as a mere protective measure. Welcome the day when the number of college dining halls can be reduced. The space gained thereby can very profitably be used for classrooms.

Infirmary

The health service of the college was completely reorganized during the summer months. Pretty largely on the request of the

students themselves the Board of Managers authorized a health service fee of six dollars annually for each student. With the income from this fee the college has been able to set up an infirmary in the basement of Davis Hall consisting of a doctor's office, a nurse's consulting room, and two hospital rooms—one for boys and one for girls—with five beds in each to be used for emergencies (cases of serious illness are handled by the hospital at Wakefield). A full-time registered nurse is now at the beck and call of the students daily, and the doctor maintains a regular office hour each day. The students are making use of this service as witnessed by the following report from the nurse: number of calls in September—119 (13 days); October—333; November—280; December—203 (18 days). The income for the first year will not be sufficient to pay the entire cost of setting up the infirmary. The college has advanced the necessary money. The health service has been debited with this amount. In two or three years, barring unforeseen health demands, this debt will have been paid and the surplus can then be used to improve the service. Several of the alumni have been quite helpful in their efforts to place the college in a position above embarrassing criticism because of an inadequate health service.

Library

The Library is the educational focal-point of a college. The Rhode Island State College now has a fine building and adequate equipment of everything except the very things of which a library is made—books. The college is woefully deficient in reference works, except governmental and land-grant college publications, and books essential for the best instruction and research work. The criticism is made of our students that they do not use the library. The prerequisite for extensive use of the library is a wealth of material available and a personnel that encourages and assists students in a wider use of library facilities.

The land-grant college survey developed the fact that Rhode Island loaned fewer books, both total and per capita, than any other state college library, and further that our annual expendi-

ture per student was about $2.50; whereas libraries which showed a usage above the average had an annual expenditure of more than $20.00 per student. As rapidly as possible the college should work toward a budget calling for a per student expenditure of a minimum of $10.00 annually.

Administrative Reorganization

The administrative set-up of the college has been changed somewhat. It can best be visualized as follows:

President's Office—General Administration of the College

A. Administrative Division
   1. Registrar's Office
   2. Fiscal Department
   3. Student Activities headed by Dean of Men and Dean of Women
   4. Superintendent of Buildings
   5. Service Department
   6. Military Tactics
   7. Physical Education

B. Instructional Division
   1. School of Engineering
      a. Chemical
      b. Civil
      c. Electrical
      d. Mechanical
      e. Mathematics
      f. Physics
   2. School of Science and Business Administration
      a. Art
      b. Bacteriology
      c. Botany
      d. Chemistry
      e. Education and Psychology
      f. Economics and Government
      g. English and History
      h. Modern Language
      i. Zoology

3. School of Agriculture
    a. Agricultural Economics and Farm Management
    b. Agronomy
    c. Animal Husbandry
    d. Horticulture
    e. Poultry Husbandry
4. School of Home Economics
    a. Foods
    b. Textiles
    c. College Boarding

C. Research Division
1. Agricultural Experiment Station
2. Egg Laying Contest

D. Extension Division
1. Farm Bureaus
2. Home Demonstration
3. Boys' and Girls' Work

Standing Committees of the Faculty

Administrative Council—Bressler, Adams, Barlow, Freeman, Gilbert, Keaney, Peck, Wales, Whittemore.

Advanced Degrees—Browning, Andrews, Gilbert, Newman, Wales.

Athletic—Tyler, Barlow, Browning, Keaney, Potter, Webster.

Calendar—Barlow, Peck, Tucker.

Catalog—Churchill, Carleton, Mrs. Christopher, Eldred.

College Commons—Whittemore, Whelan, Scott, Stillman, Stowell.

Courses—Anderson, Dickson, Ince, Ladd, Whittemore.

Examination Schedule—Webster, Andrews, Emery.

Examination of Entering and Conditioned Students—Tucker, Bills, Douglass, Phillips, Wright.

Faculty Representatives on Polygon—Ince and Churchill.

Freshman Advisors—Weldin, Andrews, Bills, Brown, Coggins, Schock, Holly, DeWolf, Parks, Mrs. Christopher, Wright, Luke, Dickson, Rockafellow, Christopher, Carleton, Vernon.

Freshman Week—Ince, Freeman, Weldin.

Fire—Burdick, Adams, Whelan.

Fraternities—Barlow, Faculty Advisors.

Inspection—Freeman, Adams, Billmyer, Peck, Whelan.

Intra-Mural Athletics—Tootell, Durham, Holly, Keegan.

Library—Churchill, Emery, Hart, Karbaum, Rockafellow, Vernon.

Placement Service—Newman.

Recitation Schedule—Tyler, Brown, Schock.
Scholarship and Student Aid—Bills, DeWolf, Dickson, Peck, Stuart.
Social—Barlow, Browning, Coggins, Peck, Mrs. Christopher.
Extra-Curricula Activities—Wales, Christopher, Parks, Phillips.
Student Activities Tax—Tyler, Barlow, Keaney, Wales, Weldin.
Women's Athletic Committee—Mrs. Keaney, Lees, Luke.

Changes in Personnel

During the year only four people left us—Professor Lillian Peppard, Stanley W. Hetherington, and Miss Alice R. Miller resigned. The Board of Managers notified Professor H. L. Jackson in January, 1931, that his contract would not be renewed at its expiration in September.

By action of the Board of Managers all employees of academic training on the resident extension and research staffs were given professional ranks. This does not change the character of the work they have been doing, but it does give them status on the college faculty that they never have had. This is a step toward coordinating all the educational activities of the college. From time to time no doubt certain members of the research and extension staffs will be called on to teach. At such times their salaries will have to be pro-rated on the basis of service performed in the several divisions.

The following new personnel has been added to the college force for the year 1931-2:

Mr. Homer O. Stuart was appointed Professor of Poultry Husbandry.

Mr. Stuart was graduated from the Pennsylvania State College in 1925 with the B. S. degree in Poultry Husbandry, and received his M. S. degree from Kansas State College in 1927. He has had several years' commercial experience. During the past four years he was assistant professor of poultry husbandry at the University of New Hampshire.

Dr. John Paul Delaplane has been appointed Assistant Research Professor of Animal Breeding and Pathology.

Dr. Delaplane was graduated from the Ohio State University in 1929 with D. V. M. degree. He received the M. S. degree from the same University in 1931.

Dr. Wilbur George Parks was appointed Assistant Professor of Physical and Analytical Chemistry.

Dr. Parks is a graduate of the University of Pennsylvania in the class of 1926, A. B. degree. He received his M. A. from Columbia University in 1928, and his Ph. D. in 1930. His major work was in chemistry, and his minor in physics and mathematics. His experience consists of one year's teaching at Drexel Institute, Philadelphia, three years as assistant in chemistry at Columbia University, and one year as lecturer at Columbia.

Dr. Arthur A. Vernon has been appointed Instructor in Physical Chemistry.

He was graduated from Union College in 1924 with the B. S. degree in chemistry. For three years thereafter he was engaged in research work in the General Electric Company at Schenectady. In 1927 he entered Princeton as a graduate student, and received the degree of Ph. D. in 1930. During 1930-31 he has been engaged in experimental and development work for the Du Pont Ammonia Corporation.

Mr. Ralph K. Carleton has been appointed Instructor in General Chemistry.

He received the B. S. degree in chemistry and physics from Boston University in 1919. Three years later he received the M. A. degree in chemistry from Harvard University. From 1923-30 he was head of the department of chemistry at Shurtleff College, Illinois. In 1930 he entered George Peabody College to study for his Ph. D., the work for which has been completed and the degree will be conferred in June, 1932.

Miss Ora Mae Luke was appointed Instructor in Home Economics.

Miss Luke is a graduate of the State Teachers College of Mississippi, class of 1926, and George Peabody College for Teachers, class of 1928—B. S. degree in home economics. She has taken graduate work at the Iowa State College, and Teachers College, Columbia University, receiving her M. A. in 1931 from Columbia. Her teaching experience includes five years in home economics in the public schools of Mississippi, and one year in the State Trade School of Bridgeport, Connecticut.

Miss Josephine T. Lees has been appointed part-time Instructor in English, and secretary to the President.

She received her A. B. degree from The Pennsylvania State College in 1930, and attended the University of Pennsylvania from February until June, 1931. During her undergraduate days she was president of the Women's Athletic Association and Glee Club, and a member of the hockey, basketball, track, and rifle varsity teams, and received a silver loving cup, the highest athletic award for girls in the college.

Miss Mary Reid Scott was appointed Instructor in Home Economics.

Miss Scott prepared for college at the East Greenwich Academy, and was graduated from Rhode Island State College in home economics in the class of 1927. Since graduation Miss Scott has taken the dietitian course at the Presbyterian Hospital, New York. She has had experience as assistant manager in one of the Childs Restaurants in New York City, and for two years dietitian and matron at the East Greenwich Academy.

Mr. John George Fielding has been appointed Assistant in Agricultural Economics.

He was graduated from the Rhode Island State College in 1931, receiving his B. S. in Business Administration. He was connected with the department of agricultural economics at the Experiment Station during the summer of 1930.

Mr. Harold C. Knoblauch has been appointed Assistant in Agronomy in the Experiment Station.

Mr. Knoblauch is a graduate of the Michigan State College in the class of 1931. His scholastic record is very good and the recommendations accompanying his application are uniformly commendatory.

Commencement

A class of ninety-two men and women was graduated in June. The Commencement functions began with the Senior Class exercises on the morning of June 6. An appropriate program was given and the class presented to the college library an electric clock in memory of the many happy hours they had spent at the

college. The alumni reunion was held during the afternoon; it was attended by more than 500 alumni and friends of the college, the largest group ever to return for an occasion of this kind. Saturday night the annual faculty reception was given. The Baccalaureate exercises were held Sunday. The address, "Wisdom Is Better," was delivered by Rev. W. Earl Leddon of Providence.

The following is the Commencement program

Music—Spanish Dance ..... Gade
Invocation.....Rev. John A. O'Rourke
Pastor, Wakefield, R. I.
Greetings.....Dr. Walter E. Ranger,
President Board of Managers.
Address.....His Excellency, Norman S. Case,
Governor of Rhode Island
Address.....Raymond G. Bressler, President of College
Conferring of Degrees
Formal close of Thirty-Ninth year of the College.

The advanced degree of Chemical Engineer was conferred on Nelson Church White, the honorary degree of Doctor of Laws conferred on his Excellency Governor Norman S. Case, and Doctor of Science on Dean Ralph L. Watts of The Pennsylvania State College.

Inauguration of the President

On October 24, 1931, the official inauguration of the President took place. This meeting was attended by a thousand or more people. Several hundred written congratulations were received, and official representatives to the inaugural ceremonies were sent from the following colleges: Yale, Harvard, Brown, Columbia, Vermont, Rutgers, Bowdoin, North Carolina, Allegheny, Union, Amherst, Colby, Wesleyan, Trinity, Mt. Holyoke, Wheaton, Tufts, Missouri, Pennsylvania State, R. I. College of Education, Mass. Inst. of Technology, Mass. State, Worcester Polytechnic Inst., Cornell, Maine, California, Illinois, Virginia Polytechnic Inst., Boston College, Wellesley, Smith, Middlebury, Texas A. & M., Coast Guard Academy, Connecticut, Wisconsin, Columbia (Teachers College), Texas University, Arizona, New Hampshire, New Mexico, Oklahoma, Pembroke, Simmons, Northeastern, Florida, Univ. of Pennsylvania.

The formal program follows:

INAUGURATION PROGRAM

His Excellency, Norman S. Case, Presiding

Processional.....Music by the College Orchestra

Invocation.....Rev. Lorenzo C. McCarthy
President of Providence College

Singing—"America the Beautiful".....By the Assembly

Greeting on Behalf of the State.....Dr. Norman S. Case
Governor of the State of Rhode Island

Greeting on behalf of New England Colleges and Universities
Dr. Edward M. Lewis
President of the University of New Hampshire

Address.....Dr. Ralph L. Watts
Dean, School of Agriculture, Pennsylvania State College

Address: "Yesterday and Tomorrow".....Dr. Kenyon L. Butterfield
Former President, Rhode Island State College

Singing—"Inaugural Hymn".....By the Student Chorus

Induction of President Bressler.....Dr. Walter E. Ranger
President of the Board of Managers

Inaugural Address.....Raymond G. Bressler
President of Rhode Island State College

Singing of Alma Mater.....By the Student Chorus

Benediction.....Rev. Edward Holyoke

Recessional.....Music by the College Orchestra

After the Inaugural Exercises came the following events:

1:00 P. M. Inaugural Luncheon.....South Hall
For the President, Board of Managers, Governor and his Staff, Speakers, and Institutional Representatives

2:00 P. M. Football Game.....Student Field
U. S. Coast Guard Academy vs. R. I. State College

7:30 P. M. Rhode Island State College Pageant..Edwards Hall

9:00 P. M. Board of Managers' Reception to the President
Lippitt Hall

Preceding the inauguration exercises proper, the college was signally honored by conferences over a period of five days by state-wide organizations. The condensed program follows:

SUNDAY, OCTOBER 18
Luncheon, Providence Branch, National
Association of Power Engineers

WEDNESDAY, OCTOBER 21
All Rhode Island Women's Conference

THURSDAY, OCTOBER 22
Rhode Island Agricultural Conference
Rhode Island State College Pageant
(Repeated also on Friday and Saturday)
Combined Rhode Island State College and
Agricultural Conference Exhibits
(Open also on Friday and Saturday)

FRIDAY, OCTOBER 23
Rhode Island Agricultural Conference
Rhode Island Business Men's Association
Rhode Island Section of the American
Chemical Society

Many prominent speakers from the New England and Middle Atlantic States appeared on these programs. The Lieutenant Governor presided at the joint meeting on Friday night of the Agricultural Conference and the Business Men's organization of Rhode Island; the college received wide mention in the press —many of the speeches delivered at the various conferences were printed in their entirety.

This phase of the annual report would not be complete without mentioning the splendid cooperation of the faculty and students and thanking Dr. Harold Browning for his effective work as general chairman of all inaugural committees, and Dean Helen Peck for her very constructive assistance on every score. Her pageant "Education in Rhode Island", written for the occasion, was presented four times to crowded houses. It should be published. The Inaugural Hymn, written also by Dean Peck, is submitted herewith.

Inauguration Hymn

Tune: Ein' Feste Burg

Oh God of wisdom, God of Love,
The source of truth and knowledge,
Look down upon us from above
Aid and sustain our College.
Imbue her at this hour
With wisdom and with power,
That she may stand for right,
That she send forth her light,
And serve both state and nation.

Be with her leader; grant that he
In wisdom may direct her.
With vision clear, and loyalty,
Defend her and protect her.
May he on Thee rely,
May he have courage high,
And strength to dare and do,
His purpose ever true,
Be with him, Heavenly Father.

May all who teach and all who learn
In true cooperation
Unite to make their chief concern
The cause of education.
May life be full of zest
For each who gives his best,
And may the College be
One loyal family
United in thy service.

Rhode Island State, our College dear,
To Thee, we now commend her.
We love her, we her name revere.
Wilt Thou Thy blessings send her.
The search of truth her aim;
Unsullied stands her name;
And ours shall be the care
To keep it pure and fair.
We thank Thee for this College.

In addition to the clock presented by the Class of 1931, the college appreciates the gift of a fine photograph of the late President Howard Edwards presented by the Class of 1930 which hangs in the library in the building which bears his name.

Especially gratifying is it to record our thanks for the generous action of a member of your Board and a friend of the college for many years, Mr. R. S. Burlingame, who has contributed a fine player-piano with music cabinet. The instrument has been placed in South Hall and will be much enjoyed by students and faculty.

Respectfully submitted,

RAYMOND G. BRESSLER,
President.

January 12, 1932

Report of the Registrar

Attendance

TABLE NO. 1

Showing attendance by Classes during years 1927-1931

Class	1927-28	1928-29	1929-30	1930-31	1931-32
Graduate	4	2	1	2	7
Senior	83	96	98	97	127
Junior	110	120	110	152	147
Sophomore	124	130	201	162	184
Freshman	189	252	206	217	319
Irregular	14	7	6	15	13
Total	524	607	622	645	797

TABLE NO. 2

Showing Number of Men and Women and of New and Previous Matriculates, by Classes for Collegiate Year 1931-1932

CLASS	SEX		DATE OF MATRICULATION	
	Men	Women	Previous to 1931	1931
Graduate	7	0	6	1
Senior	100	27	127	0
Junior	107	40	147	0
Sophomore	150	34	167	17
Freshman	257	62	7	312
Irregular	8	5	6	7
Total	629	168	460	337

TABLE NO. 3

Showing Distribution of Undergraduates in the Various Courses during 1931-1932

	Agri.		Engineering					Gen. Sci.		Home Ec.	Bus. Ad.		Total
CLASS			Civil	Chem	Elec.	Mech.	Total						
	M	W	M	M	M	M	M	M	W	W	M	W	
Senior	6	0	22	7	11	16	56	21	3	24	17	0	127
Junior	2	1	19	15	8	28	70	23	7	28	12	4	147
Sophomore	4	0	14	11	27	30	82	34	9	22	30	3	184
Freshman	11	1	..	..	..	..	118	65	12	36	63	13	319
Irregular	1		..	..	..	1	1	5	3	1		2	13
Total	24	2	55	33	46	75	327	148	34	111	122	22	790

Home Residence of Students Enrolled in Four-Year Courses

A. Resident outside of the State:

China:
- Shanghai 1

India:
- Calcutta 1

Connecticut:
- Farmington 2
- Groton 1
- Manchester 1
- Mystic 1
- Naugatuck 1
- New Haven 3
- Oakdale 1
- Old Saybrook 3
- Poquonock Bridge 1
- Stonington 5
- Thomaston 1

20

Georgia:
- Brunswick 1

Illinois:
- Chicago 1
- Galesburg 1

Maine:
- North Waterford 2

Massachusetts:
- Attleboro 5
- Brockton 9
- Campello 1
- Chicopee Falls 6
- Dorchester 2
- East Dennis 1
- Fall River 10
- Foxboro 1
- Framingham 1

Gardner	2	Michigan:	
Greenfield	1	Detroit	1
Haverhill	1		
Lancaster	1	New Jersey:	
Lawrence	1	Clifton	1
Lowell	1	Elizabeth	1
Middleboro	1	Garfield	1
Needham	1	Hawthorne	1
New Bedford	2	Kenilworth	1
No. Attleboro	7	Lodi	1
Plainville	1	Roselle Park	6
Pottersville	1		12
Provincetown	2	New York:	
Rehoboth	3	Amsterdam	2
Revere	2	Fort Wright	1
Roxbury	1	Lisbon	1
Seekonk	1	New York City	1
South Braintree	1	Rossville, L. I.	1
Springfield	5	Seneca Falls	1
Taunton	2		7
Three Rivers	1		
Watertown	1		
Webster	1		
Willimansett	2	Pennsylvania:	
Winchendon	1	Childs	1
Worcester	2	Hazelton	1
	81	Pittston	1
			3

Total attendance from outside State 131

B. Resident in Rhode Island by Counties and Towns:

Bristol:		West Warwick	11
Barrington	5		46
Bristol	15	Newport:	
Warren	6	Jamestown	5
	26	Little Compton	1
		Newport	57
Kent:		New Shoreham	3
Coventry	3	Portsmouth	2
East Greenwich	12		68
Warwick	20		

Providence:	
Burrillville	6
Central Falls	10
Cranston	60
Cumberland	1
East Providence	25
Johnston	1
Lincoln	6
North Providence	2
Pawtucket	48
Providence	226
Smithfield	1
Woonsocket	34
	420
Washington:	
Hopkinton	4
Narragansett	4
North Kingstown	7
Richmond	6
South Kingstown	23
Westerly	41
	85
Total attendance from within the State	645

Preparatory Schools Represented in Freshman Class

In Rhode Island:	
Barrington High	3
Bristol:	
Colt Memorial High	7
Burrillville High	6
Central Falls High	3
Cranston High	19
Cumberland High	1
East Greenwich Acadmy	4
East Providence High	11
Little Compton High	1
Newport:	
DeLaSalle	6
Rogers High	22
New Shoreham:	
Island High	2
North Kingstown High	3
Pawtucket Senior High	21
Providence:	
Classical High	8
Commercial High	4
Hope Street High	7
LaSalle Academy	9
Lincoln School	1
Moses Brown School	1
St. Xavier's Academy	3
Technical High	48
South Kingstown High	6
Warren High	2
Warwick High	6
West Warwick High	3
Westerly High	23
Woonsocket High	14
Mt. St. Charles Academy	1
St. Clare Academy	1
	246
In Connecticut:	
Fitch High, Groton	1
Naugatuck High	1
Old Saybrook High	2
Stonington High	5
In Georgia:	
Glynn Academy, Brunswick	1
In Illinois:	
Chicago	
Parker Senior High	1
In India:	
Calcutta University	
Junior Department	1

In Maine:		In New Jersey:	
Bridgeton Academy	1	Roselle Park High	2
In Massachusetts:		In New York:	
Attleboro High	3	Amsterdam High	2
Boston English High	1	Fisher's Island High	2
Brockton High	3	N. Y. City: Wadleigh High	1
Chicopee Falls High	3	Rochester, West High	1
Deerfield Academy	1	Seneca Falls	
Fall River:		Mynderse Academy	1
B. M. C. Durfee	2	Unadilla High	1
Foxboro High	1		
Leominster High	1	In Ohio:	
Needham High	1	Columbus	
North Attleboro High	4	East High	1
Plainville High	1	North High	1
Provincetown High	1		
Revere High	1	In Pennsylvania:	
Roxbury High	1	Upper Darby High	1
Swansea, J. Case High	1		
Taunton High	2	In Vermont:	
Watertown High	1	White River Junction	
Winchendon Murdock School	1	Hartford High	1
Worcester, South High	1		
		In Virginia:	
In New Hampshire:		Staunton Military Academy	1
Kingston			
Sanborn Seminary	1		

Total number of students received from high school	305
Total number of students re-classified and repeating work	7
Total number of students transferred from other colleges	7
Total number of students classified as Freshmen	319

Average age of men and women, Oct. 1, 1931—18 yrs. 9 mos. 24½ days

Age of youngest member of class, Oct. 1, 1931—16 yrs. 6 mos. 10 days

Age of oldest member of class, Oct. 1, 1931—25 years 1 month 9 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, 1931

Expenditures	State Maintenance	Current	Morrill 1890	Morrill 1862	Trust	Capper Ketcham	Smith-Lever	Totals
Salaries	$102,842.41	.....	$50,000.00	$1,574.28	$1,441.67	$18,316.12	$6,748.86	$180,923.34
Labor	45,344.33	$4,513.68	.....	.....	30,742.99	.....	5.00	80,606.00
Special Services	774.26	265.50	.....	.....	.....	.....	.....	1,039.76
Fuel	19,982.32	3,235.80	.....	.....	1,439.98	.....	.....	24,658.10
Food	.....	.....	.....	.....	50,624.65	.....	.....	50,624.65
Rental	4,000.00	10.00	.....	.....	.....	.....	18.00	4,028.00
Educational Supplies	6,000.00	2,585.97	.....	.....	.....	.....	.....	8,585.97
Recreational Supplies	.....	3,463.35	.....	.....	.....	.....	.....	3,463.35
Agr. & Bot. Supplies	.....	1,988.72	.....	.....	147.89	.....	.....	2,136.61
Office Supplies	.....	1,343.82	.....	.....	12.50	75.69	1,183.55	2,615.56
Sanitary Supplies	.....	1,375.84	.....	.....	2,314.05	.....	.....	3,689.89
Miscellaneous Supplies	17.68	2,283.86	.....	.....	16,816.90	4.20	109.14	19,231.78
Bldg. Rep. Material	2,858.46	598.18	.....	.....	.....	.....	.....	3,456.64
Heating & Plumbing Material	2,827.07	391.77	.....	.....	116.39	.....	.....	3,335.23
Electrical Material	1,162.76	340.96	.....	.....	17.20	.....	.....	1,520.92
Equipment Material	1,022.19	657.79	.....	.....	413.75	.....	46.39	2,140.12
Highway Material	.....	20.62	.....	.....	.....	.....	.....	20.62
Repair Labor	8,319.52	196.69	.....	.....	404.90	.....	.....	8,921.11
Repair Contracts	3,810.00	.....	.....	.....	.....	.....	.....	3,810.00
Traveling	.....	4,259.60	.....	.....	1,357.77	.....	2,220.12	7,837.49
Freight & Express	.....	1,344.62	.....	.....	921.39	6.64	6.43	2,279.08
Telephone & Telegraph	.....	1,429.08	.....	.....	.....	.....	.....	1,429.08
Postage	.....	805.96	.....	.....	.....	.....	196.76	1,002.72
Printing & Binding	.....	3,467.49	.....	.....	.....	277.50	214.00	3,958.99
Advertising	.....	301.50	.....	.....	.....	.....	.....	301.50

Expenditures	State Maintenance	Current	Morrill 1890	Morrill 1862	Trust	Capper Ketcham	Smith-Lever	Totals
Light, Heat & Power	.....	4,903.12	.....	.....	44.00	.....	.....	4,947.12
Motor Vehicle Expense	.....	2,204.24	.....	.....	.....	.....	.....	2,204.24
Subscriptions	.....	662.74	.....	.....	.....	.....	.....	662.74
Miscellaneous Expense	.....	1,362.94	.....	.....	9.01	.....	.....	1,371.95
Refunds	.....	4,325.56	.....	.....	2,656.06	.....	.....	6,981.62
Forage	.....	7,713.38	.....	.....	.....	.....	.....	7,713.38
Furnishings	.....	766.18	.....	.....	2,337.36	.....	.....	3,103.54
Replacements	1,620.00	1,086.78	.....	.....	9.99	.....	.....	2,716.77
Classroom Equipment	.....	188.16	.....	.....	.....	.....	.....	188.16
Office Equipment	31.20	646.40	.....	.....	.....	407.73	450.00	1,535.33
Household Equipment	82.82	540.40	.....	.....	1,468.15	.....	.....	2,091.37
Educa. & Lab. Equipment	4,648.89	867.61	.....	.....	120.49	3.09	44.41	5,684.49
Agricultural Equipment	237.09	203.51	.....	.....	.....	.....	.....	440.60
Miscellaneous Equipment	.....	168.16	.....	.....	.....	59.25	4.48	231.89
Permanent Improvement	7,489.00	.....	.....	.....	.....	.....	.....	7,489.00
Total	$213,070.00	$60,519.98	$50,000.00	$1,574.28	$113,417.09	$19,150.22	$11,247.14	$468,978.71

RECEIPTS	State Maintenance	Current	Morrill 1890	Morrill 1862	Trust	Capper Ketcham	Smith Lever	Reserve	Totals
Balance brought forward		$688.22			$5,275.40			$4,000.00	$9,963.62
Federal Appropriation			$50,000.00			$20,147.57	$11,680.24		81,827.81
Interest for year				$4,228.95					4,228.95
State Appropriation	213,070.00								213,070.00
Dormitory fees		9,615.50							9,615.50
Department fees		6,556.26							6,556.26
Department service		1,403.10							1,403.10
Department sales		31,535.55							31,535.55
Laboratory sales		10,821.84							10,821.84
Vocational Education		150.00			1,500.00				1,650.00
Tuition		4,937.50							4,937.50
Interest		1,608.54							1,608.54
Refunds		1,860.88							1,860.88
Scholarships—4 H. Clubs		331.00							331.00
Miscellaneous		22.08							22.08
Boarding					92,291.48				92,291.48
Bookstore					13,979.19				13,979.19
Military sales					2,842.50				2,842.50
Furniture sales					468.50				468.50
Advanced dairy registration					2,533.93				2,533.93
Poultry testing					2,256.90				2,256.90
Total Receipts	$213,070.00	$69,530.47	$50,000.00	$4,228.95	$121,147.90	$20,147.57	$11,680.24	$4,000.00	$493,805.13
Total Expenditures	213,070.00	60,519.98	50,000.00	1,574.28	113,417.09	19,150.22	11,247.14		468,978.71
Balance on hand		9,010.49		$2,654.67	$7,730.81	$997.35	$433.10	$4,000.00	$24,826.42
Reverts to U. S. Treasury						997.35	433.10		1,430.45
Balance carried forward		$9,010.49		$2,654.67	$7,730.81			$4,000.00	$23,395.97

EXPENDITURES	Hatch	Adams	Purnell	Miscell.	State Egg-Laying	State Feeding Stuffs	State Fertilizer Control	Egg-Laying Contest	Totals
Buildings and Land.....	$736.37	626.84	$4,877.78	$1,412.83	$11,944.91	.....	.....	$121.00	$19,719.73
Communication Service	77.43	20.70	303.24	66.70	.....	.....	$1.50	71.18	540.75
Contingent Expenses	.....	.....	.....	52.60	.....	.....	.....	47.95	100.55
Feeding Stuffs.....	247.95	615.34	1,035.63	169.97	.....	.....	.....	1,102.92	3,171.81
Fertilizers	368.28	.....	449.04	19.00	.....	.....	.....	.....	836.32
Furniture	131.20	100.00	34.25	46.15	.....	.....	.....	4.80	316.40
Heat, Light, Water, Power.....	90.38	161.52	853.15	92.21	.....	$36.76	233.40	174.17	1,641.59
Labor	4,973.58	1,149.51	8,584.62	2,313.87	.....	.....	107.50	781.44	17,910.52
Library	292.02	115.40	433.32	12.71	.....	.....	4.00	.....	857.45
Livestock	.....	5.00	.....	.....	.....	.....	.....	.....	5.00
Publications	1,045.88	.....	223.33	98.55	.....	90.00	135.00	.....	1,592.76
Salaries	5,061.27	11,697.77	38,947.71	1,294.54	.....	1,000.00	4,125.02	1,450.88	63,577.19
Scientific Equipment	21.96	94.08	480.66	.....	.....	.....	96.20	5.88	698.78
Scientific Supplies	84.59	223.45	278.05	11.97	.....	38.25	164.99	.....	801.30
Stationery & Office Supplies....	151.25	.....	104.22	24.30	.....	11.00	26.50	59.54	376.81
Sundry Supplies	700.81	54.99	686.17	229.64	.....	15.73	23.52	84.45	1,795.31
Tools and Machinery.....	615.05	125.12	1,194.84	386.31	.....	.....	2.60	56.80	2,380.72
Transportation of Things.....	167.10	10.28	122.47	166.92	.....	.....	11.73	18.27	496.77
Traveling	234.88	.....	1,391.52	301.46	.....	108.09	167.26	4.06	2,207.27
Total expenditures	$15,000.00	$15,000.00	$60,000.00	$6,699.73	$11,944.91	$1,299.83	$5,099.22	$3,983.34	$119,027.03

AGRICULTURAL EXPERIMENT STATION

RECEIPTS	Hatch	Adams	Purnell	Miscell.	State Egg-Laying	State Feeding Stuffs	State Fertilizer Control	Egg-Laying Contest	Totals
Balance brought forward	.....	.....	.....	$42.20	$11,944.91	.....	$567.29	.....	$12,554.40
Federal appropriation	$15,000.00	$15,000.00	$60,000.00	.....	.....	.....	.....	.....	90,000.00
State appropriation	.....	.....	.....	.....	.....	1,300.00	.....	.....	1,300.00
Department fees	.....	.....	.....	.....	.....	.....	4,552.00	$1,450.00	6,002.00
Department sales	.....	.....	.....	6,212.51	.....	.....	.....	2,622.17	8,834.68
Department service	.....	.....	.....	216.34	.....	.....	.....	.....	216.34
Interest	.....	.....	.....	220.73	.....	.....	.....	.....	220.73
Rental	.....	.....	.....	180.00	.....	.....	.....	.....	180.00
Refunds	.....	.....	.....	24.77	.....	.....	.....	.....	24.77
Total Receipts	$15,000.00	$15,000.00	$60,000.00	$6,896.55	$11,944.91	$1,300.00	$5,119.29	$4,072.17	$119,332.92
Total Expenditures	$15,000.00	$15,000.00	$60,000.00	6,699.73	11,944.91	1,299.83	5,099.22	3,983.34	119,027.03
Balance on hand	.....	.....	.....	196.82	.....	.17	$20.07	$88.83	$305.89
Reverts to State Treasury	.....	.....	.....	.....	.....	.17	.....	.....	.17
Balance carried forward	.....	.....	.....	196.82	.....	.....	$20.07	$88.83	$305.72

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, 1931.

Balance on Hand June 30, 1930 (exclusive of State Fertilizer Control and State Feeding Stuffs Inspection...		$27,956.10
Balance on Fertilizer Control and Feeding Stuffs Inspection		567.38
Total Balance		$28,523.48
Less unexpended amount reverting to Nation and State...		6,005.46
Balance carried forward July 1, 1930		$22,518.02
Total income during year		590,620.03
Total		$613,138.05
Total expenditures during year		588,005.74
Balance on hand June 30, 1931		25,132.31
Unexpended balance reverting on Smith-Lever Fund	$433.10	
Unexpended balance reverting on Capper-Ketcham Fund	997.35	
Unexpended balance reverting on State Feeding-Stuffs	.17	
		1,430.62
Balance carried forward July 1, 1931		$23,701.69

INCOME

Income from Students:		
Tuition fees	$4,937.50	
Matriculation and incidental fees	6,556.26	
Laboratory fees and chemicals	10,821.84	
Dormitory fees	9,615.50	
Dining halls	92,291.48	
Store sales	13,979.19	
		$138,201.77
Income from State and Nation:		
State Maintenance	$213,070.00	
Morrill Act of 1890	50,000.00	
Morrill Act of 1862	4,228.95	
Hatch Act of 1887—Experiment Station..	15,000.00	
Adams Act of 1906—Experiment Station.	15,000.00	
Purnell Act of 1923—Experiment Station	60,000.00	
Smith Lever Act of 1914—Extension Service	11,680.24	
Capper-Ketcham Act of 1928—Extension	20,147.57	
		$389,126.76

Income from other sources:		
Department sales and service	$41,062.56	
Interest	1,608.54	
Miscellaneous	3,841.88	
		$46,512.98
Income from Experiment Station:		
Department sales and service	$6,633.62	
Interest	220.73	
		$6,854.35
Income from Regulatory Funds:		
State-Feeding Stuffs Inspection (Appropriation)	$1,300.00	
State-Fertilizer Control (Fees)	4,552.00	
Egg-laying Contest, Fees and Sales	4,072.17	
		$9,924.17
		$590,620.03
Receipts from Tuition:		
Students taking course of one year or more		628
Students paying tuition (non-resident in Rhode Island) at the rate of $50.00 per year		104
Amount of tuition paid		$4,937.50

EXPENDITURES

Expenditures, exclusive of Experiment Station and Extension Service:	
Agricultural and Botanical Supplies	$2,136.61
Advertising in Publications	301.50
Equipment and Furniture	8,994.25
Forage and Veterinary Supplies	7,713.38
Freight and Express	2,218.29
Fuel	24,658.10
Furnishings and Replacements	5,820.31
Laboratory Supplies	8,585.97
Labor	80,601.00
Light, Heat and Power	4,947.12
Motor Vehicle Expense	2,204.24
Office Supplies	1,170.29
Permanent Improvements	7,489.00
Postage	797.06
Printing	3,437.49
Provisions	50,624.65
Recreational	3,463.35
Refunds	6,981.62
Rental	3,995.00
Repairs	23,158.25

Salaries	155,388.21
Sanitary Supplies	3,689.89
Special Services	1,039.76
Subscriptions	662.74
Telephone & Telegraph	1,338.24
Traveling	5,437.18
Miscellaneous	20,480.71
	$437,334.21
Expenditures, Experiment Station	108,644.64
Expenditures, Extension Service	31,644.50
Expenditures, State Feeding, State Fertilizer & Egg-Laying	10,382.39
	$588,005.74

ANALYSIS OF BALANCE, JULY 1.

	1930	1931
Morrill Fund of 1890		
Morrill Fund of 1862		$2,654.67
Smith-Lever Fund-Extension Service	$703.17	
Capper-Ketcham Fund-Extension Service	2,303.99	
Hatch Fund — Experiment Station		
Adams Fund — Experiment Station		
Purnell Fund — Experiment Station		
Miscellaneous — Experiment Station	42,20	196.82
State Feeding Stuffs	.09	
State Fertilizer Control	567.29	20.07
State Egg-Laying Contest—Expt. Station	11,944.91	
Egg-Laying Contest		88.83
State Maintenance	2,998.21	
Current Fund	688.22	9,010.49
Trust Fund	5,275.40	7,730.81
Reserve Fund	4,000.00	4,000.00
	$28,523.48	$23,701.69

STUDENT ACTIVITIES ACCOUNT

		Dr.	Cr.
By Balance brought forward from last year			$3,982.46
Receipts during year:			
(a) Student Tax	$11,675.00		
(b) Season Tickets	240.00		
(c) Interest	127.80		
			$12,042.80

To Band	.93	
Baseball	2,618.59	789.00
Basketball	2,804.93	913.26
Beacon	660.00	
Football	8,751.36	4,192.47
Glee Club-Men	199.36	
Lecture Association	371.00	
Loans	482.62	139.61
Orchestra	90.00	
Phi Kappa Phi	75.00	
Tax	1,324.17	544.71
Tennis	102.46	
Track	2,279.47	314.03
Wrestling	2.00	
Y. W. Athletic Association	305.94	7.90
Y. W. Glee Club	13.79	
Balance held in bank	2,844.62	
	$22,926.24	$22,926.24

ALUMNI STUDENT LOAN FUND

By amount of contribution to July 1, 1930		$1,194.58
By amount of interest accrued to July 1, 1930		444.12
By amount of interest during 1930-1931		27.49
To Loans out, July 1, 1931	$1,383.50	
Cash on hand	282.69	
	$1,666.19	$1,666.19

CAMPUS CLOCK FUND

By gifts from Senior Classes, 1908-1919	$226.41
By amount of interest accrued to July 1, 1930.	253.44
	$479.85

FREDERICK ROY MARTIN STUDENT LOAN FUND

By amount of fund received June, 1925	$150.00
By amount of interest accrued	32.42
	$182.42
To loans out	179.50
	$2.92

SCHOLARSHIP AWARDS

Rhode Island State Grange		$100.00
To Muriel Grace Fletcher in Agriculture.	$50.00	
To Dorothy Andrews Leonard in Home Economics	50.00	
	$100.00	$100.00
Rhode Island State Federation Women's Clubs		$150.00
To Bernice Mary Callaghan	$50.00	
Marjorie Barrows Preston	50.00	
Virginia Burns Beard	50.00	
	$150.00	$150.00
Triangle Club of Kingston.....		$50.00
To Gladys Novella Whipple	$50.00	
	$50.00	$50.00
Pawtucket Women's Club		$50.00
To Gladys Novella Whipple.....	$50.00	
	$50.00	$50.00
Panhellenic Association		$25.00
To Mary Evans Chase	$25.00	
	$25.00	$25.00
Women's Student Government.....		$25.00
To Mary Evans Chase	$25.00	
	$25.00	$25.00
Chi Omega Economics Prize.....		$25.00
To Kathleen Ince.....	$25.00	
	$25.00	$25.00
Wolfe-Kaplan Prize		$35.00
To Mary Evans Chase.....	$35.00	
	$35.00	$35.00

FORTY-FOURTH ANNUAL REPORT OF THE DIRECTOR OF THE AGRICULTURAL EXPERIMENT STATION*

PRESIDENT R. G. BRESSLER,
Rhode Island State College.

Dear Sir:

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

Research Work

The more important lines of work to which members of the research staff have given attention during 1931 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

Farm Management Studies. Records of the business during 1930 on 76 farms were obtained. On 13 of these farms the total credits during the year were less than $1,500. On 17 fruit farms in Providence County the average capital was $29,019 and the average labor income $1,902. On 16 poultry farms in Washington County the capital per farm was $5,864 and the labor income was $460. The average capital on 23 dairy farms in the Town of Tiverton was $8,356 and the labor income $418.

On 9 farms in the Town of New Shoreham the capital investment averaged $8,456, but on 5 of these farms the receipts for the year were less than $1,500. New Shoreham farmers have the advantage of a long growing season (212 days) and an average rainfall of 41.3 inches annually which is distributed fairly evenly throughout the year. They are handicapped by the transportation charges between Block Island and the mainland and by the fact that they have no year-round milk market.

On 19 fruit farms there were 13,986 bearing apple trees in 1930 and 4006 non-bearing trees. Of the bearing trees, 37 per cent were baldwin, 16 per cent McIntosh, 11 per cent Greening, 8 per

* Contribution No. 422. In Bulletin of Rhode Island State College, Vol. XXVII, February, 1932.

cent Gravenstein and other varieties 28 per cent. Forty-eight per cent of the non-bearing trees were McIntosh, 9 per cent Cortland, 9 per cent Delicious, 8 per cent Gravenstein, 8 per cent Baldwin, 7 per cent Wealthy and other varieties 11 per cent. There was an increase of 11.6 per cent in the number of trees in these orchards between 1925 and 1930. Of the plantings during this 5-year period, 45 per cent were McIntosh, 16 per cent Cortland, 9 per cent Baldwin, 7 per cent each, Gravenstein and Wealthy, 6 per cent Delicious, 5 per cent Greening, and other varieties 5 per cent.

On 12 farms selling milk at retail and averaging 25.8 cows per farm, the number of cows per man was 6.5 and the quantity of milk produced for 12 months of man labor was 47,168 pounds. On 12 farms selling milk at wholesale and averaging 25.5 cows per farm, the number of cows per man was 10.6 and the quantity of milk produced for each 12 months of man labor was 80,663 pounds.

The results of farm management studies carried on during 1928 and 1929 were published in station Bulletin 230 entitled, "A study of the organization and management of Rhode Island farms."

Studies in Connection with the Providence Milk Supply. The study of the sources of the Providence rail-shipped milk and cream supply has been continued and data on the shipped-in supply for the years 1927, 1928, and 1930 have been added to those obtained for 1929. These data show that increasing quantities of cream are coming from distant states. Shipments from Tennessee have grown rapidly during 1928, 1929 and 1930. Also, in the last two of these years, Wisconsin has become a source of cream for the Providence market. The most important change shown by the figures on milk supply, is the rapid increase in the shipments from Vermont. A start has been made in obtaining data as to the trucked-in supply of milk by months and by state of origin.

Container Studies with Apples. Bulletin 227, "A study of apple containers," the data for which were collected in cooperation with Mr. E. P. Christopher, Fruit Specialist, of the Rhode Island Extension Service, was published during the year. The percentages of apples showing medium and severe bruising in the different crops and in each container were:

	Baldwin	McIntosh	
	1928 crop	1928 crop	1929 crop
Round Bottom Basket.....	14.04	27.96	28.53
Tub Basket	6.43	15.61	23.68
Boston Box	1.76	7.00	6.32
Northwest Box	1.00	4.43	11.20

The average percentage of apples showing stem puncture was less than 2 per cent for Baldwins in 1928, and about 17.5 per cent for McIntosh in the two years studied. There was much less stem puncture in the two box packs than in the two basket packs.

Grading Studies with Vegetables. Further records were obtained on the costs and returns from grading vegetables such as bunched carrots, bunched beets, hothouse tomatoes, outdoor tomatoes, cucumbers, and peppers. The prices received and the general tone of the market were very much better than that of the previous year. Thus, records from two years in which distinctly different market conditions prevailed, have been obtained.

At the request of some of the local market gardeners, an attempt has been made to obtain data on the costs and returns from staking tomatoes under practical field conditions.

Agronomy

(Experiments with field crops, market-garden crops, and grasses for lawns and golf courses)

The 1931 season was favorable for most crops although there were a few rather striking exceptions. These exceptions were chiefly due to unfavorable conditions at a critical time in the development of the crop. The rainfall was above normal for the early part of the season and somewhat below normal for the latter part. A very mild fall allowed all late crops to fully mature.

Organic Matter for the Soil. In the experiment where 10 cords of stable manure applied annually is compared with chemical fertilizers and green manure, different varieties of sweet peppers were used as the crop for the year. The plat where manure only was applied yielded only about one-third as much as where the green manure and chemicals were used. Apparently the manure-only plat did not furnish the plants with sufficient available nutrients during the early, critical period of their development. Early beets and spinach in a 3-year market garden rotation yielded more with 32

tons manure-compost than with 16 tons, but peppers did not, fertilizers being uniform. Sixteen tons of manure-compost where green manure is plowed under once in 3 years, gave higher yields of early beets and spinach than did 16 tons of manure-compost alone, and in the case of spinach and peppers this yield was equal to that with 32 tons manure-compost. Reducing the manure-compost application to 8 tons reduced the yield of spinach considerably but that of the early beets and peppers but little. Late carrots and cauliflower yielded best where 32 tons of manure had been applied before the early crops.

Twenty-four tons manure-compost and 1,500 pounds of an 8-6-6 fertilizer produced about the same yield of early cabbage as did 16 tons and the same fertilizer. This yield was some 69 barrels per acre more than the yield with green manure and the same fertilizer. However, 8 tons of manure-compost and a green manure crop gave about the same yield as was secured with the 24 tons. A higher yield of tomatoes was secured with 24 tons than with 16 tons manure-compost, the fertilizer being uniform. Green manure or green manure and 8 tons of manure-compost produced as high a yield as did 24 tons. A reduction from 24 to 16 tons of manure-compost lowered the yield of celery but little and the yields with green manure or green manure and 8 tons manure-compost were about equal to those with 24 tons. The yields of early lettuce with 16 tons manure-compost were practically equal to those with 24 tons. Late spinach yielded slightly more after a spring application of 24 tons of manure-compost but with late beets the yield was higher where 16 tons were applied.

Efficiency of Fertilizers and Manures. A hay mixture consisting of clover, alfalfa, timothy, and redtop was grown on the various no-manure rotation check plats. This crop followed one of rye in 1930. The yields of dry matter in the hay varied from 2.25 to 4.15 tons per acre. On the plat that has received no nitrogen in the fertilizer during the entire course of the experiment, a yield of 3.27 tons per acre was obtained. The fertilizers used consisted of 900 pounds of a mixture analyzing approximately 0-10-8 on the no-nitrogen plat. With the same amount of a 1.5-10-8 the yield was 3.64 tons per acre. The no-nitrogen plat had the largest percentage of legumes in the hay. The hay crop was increased about 25 per

cent when the potash was increased from 900 pounds of a 2-10-5 to a like amount of a 2-10-10. The extra potash also resulted in producing a much higher percentage of legumes in the hay crop. Increasing the phosphorus resulted in only a small increase in yield and in no increase in the proportion of legumes. Reducing the amount of fertilizer from 900 to 600 pounds per acre reduced the yield by 25 per cent. Increasing the amount from 900 to 1200 pounds per acre increased the yield of hay by 10 per cent.

As in 1930, neither spinach nor beets showed as much response to manganese as in previous years on the market garden area. On another set of plats where no stable manure or compost has been used, decided increases in yield resulted with these crops when manganese was used in the fertilizer. Under these conditions mangels and potatoes were decidedly benefited by the manganese. Tomatoes on the other hand did not respond to any extent with the addition of manganese to the fertilizer.

Plant Differences and Needs. Spanish Gold sweet corn again produced the largest yield of the 7 different varieties tested. It was about 4 days later than Golden Gem, a small-eared variety bred at the North Dakota station. Gill's Golden Market, Harris' Extra Early Bantam, and Golden Sunshine matured at about the same time. Golden Age was somewhat later and Whipples' Yellow a still later type.

In tha potato seed-source test 55 different lots of seed potatoes were included. The season was not as favorable for the early potato crop as for the late. Northern-grown seed proved to be more superior to home-grown seed this year than in the 2 preceding years of this test. The yields obtained were as follows:

Variety	Source	Average yield per acre Bushels
Cobblers	Northern grown	268
"	1 year home grown	145
"	2 year home grown	117
"	3 year home grown	71
Green Mountain	Northern grown	359
" "	1 year home grown	295
" "	2 year home grown	110
" "	3 year home grown	182

Sweet corn and peppers yielded from 25 to 50 per cent more when paper mulch was used than without. There was not much difference in yields of tomatoes under the two conditions.

The past season proved to be very unfavorable for seed production with alfalfa. Only a few of the selfed strains produced enough selfed seed so that another generation can be grown. The same plants will be used again next year for continuing the inheritance studies with this crop. Several promising selections of head lettuce have been made. The different eggplant strains grown last year were grown again and selfed seed obtained from nearly all. An attempt is being made to discover strains or varieties resistant to eggplant wilt.

Market-garden crops grown with varying rations of nitrogen, phosphorus, and potash responded as follows:

To nitrogen—peppers, late beets, early spinach, early lettuce, late celery, early tomatoes on green manure, early cabbage, early beets, and late carrots.

To phosphorus—peppers, early lettuce, early spinach, early tomatoes with manure.

To potash—early lettuce, celery with green manure, late beets, and late spinach.

These are arranged in the order in which they were reduced in yield by omitting or reducing the element named.

Applying all the nitrogen at planting time in comparison with one-third at planting and two-thirds as side-dressings was tried on a few market-garden crops with the following results:

In favor of all fertilizer at planting time—tomatoes.

In favor of part nitrogen as side-dressing — late celery, early cabbage, early lettuce.

No appreciable difference—late beets, late spinach.

When the standard fertilizer application of 1500 pounds was increased by 75 per cent the yields of early tomatoes, early lettuce, late beets, and late spinach were increased but that of early cabbage and late celery was not. A further increase in amount of fertilizer failed to give further increase in yield, although the late celery responded to the 100 per cent extra.

Potatoes, onions, carrots, mangels, and tomatoes were again grown on the plats where different potash carriers are compared. Carrots

were the least affected by a lack of potash and onions the most. Kainit was the best source of potash for mangels and onions. Sulphate of potash as the carrier produced a better yield of potatoes this year than the muriate. Reducing the nitrogen in this experiment lowered the yield very materially with all crops except carrots.

The 16 different crops were grown on the project where the effect of previous crops on succeeding crops is studied. The effects of previous crops of potatoes, mangels, turnips, and corn on each of these 16 crops were noted. Considerable differences in yield were found with some of the crops following these different preceding crops. Others of the crops did not seem to be much affected by the preceding crop.

Corn, potatoes, cabbage, and carrots were grown on the plats where different phosphorus carriers are used. Rock phosphate continues to show much poorer results than other sources of phosphorus. On the more acid series of plats in this experiment a magnesium deficiency is beginning to be evident on the corn and potato crops. It is planned to study this further in greenhouse tests with soil from certain of these plats.

Silage corn was grown on the series of plats where straw-bedding manure is compared with sawdust-bedding manure. The manure is used both alone and with reinforcement of chemical fertilizers. The straw manure was slightly superior to the sawdust manure this year. The manure-alone plats were materially inferior to the chemicals-alone plat in this series. The corn responded more to phosphorus than to additional potash in the fertilizer.

Modification of Sour Soil. The following ornamental shrubs are apparently markedly benefited by liming an acid soil: German False Tamarix, Tartarin Honeysuckle, Persian Lilac, and Kolkwitzia. On the other hand several of the roses, Kerria, Hemlock, Scotch Heather, and Mountain Ash, seem to prefer an acid soid. There are about 60 different ornamental shrubs included in this experiment.

Lawn Grass Experiments. The comparison of acid, medium acid, and neutral soil for bent grass and fescue continues to show greater weed control on the acid and medium acid plats but also a reduced vigor, particularly in spring and fall. A comparison of sulphate of

ammonia and lime with nitrate of soda without lime at graduated levels of acidity shows the former to be superior in weed control and in producing a uniformly dense growth. Lead arsenate used either before or after seeding controlled Mouse-ear chickweed rather well. Kentucky bluegrass produced a good turf where fertilized with a mixture of sulphate of ammonia and lime, but Colonial (R. I.) bent continued to be more satisfactory for a lawn.

Golf Putting Green Plats. The plats represent approximately 40 varieties of bent grasses and a few fescues. Of the bent grasses the Creeping bents and Velvet bents were rather resistant to Large Brown Patch this season. Creeping bent was found to respond to liming more than Colonial (R. I.) bent or Velvet bent at a pH of approximately 4.10. Putting quality continued somewhat higher on the Colonial (R. I.) bents especially during the hottest weather and in spite of attacks of the Large Brown Patch. The Velvet bents showed greater damage from insects, particularly from a species of Sod-Web-Worm, than the other bent grasses.

Seed Production of Various Bent Grasses. Seed was harvested from 11 of the 12 varieties of bent grass under test. The Creeping bents yielded very poorly. A relatively new kind, "Oregon" bent, was substituted for one of the Seaside bents. In general the season was very unfavorable for seed production of the bents.

Fertilizer Needs of Rhode Island Bent. As in 1929 and 1930 the yields of seed were largely influenced by the amount of nitrogen supplied in the fertilizer. A very fine crop of seed was harvested from the better fertilized plats in 1930 but the 1931 yields were much less.

Animal Breeding and Pathology

(Experiments with poultry)

Pullorum Disease. Laboratory experiments have been carried on to determine the ability of *Salmonella pullorum* to attack citric acid and sodium citrate. Media were used in which these two chemicals were the sole sources of carbon. In all, 84 strains of the organism were used. It was found that, contrary to the existing literature, many strains of the organism are able to utilize the citrate radical as a source of carbon (Rhode Island Bul. 232). However, the variability of reaction of individual strains and the lack of correlation, does not indicate the test to be of any differential or diagnostic value.

Fowl Pox. Emphasis has been placed on a study of the deterioration of fowl pox virus under various conditions of treatment and storage. The work this year is more or less preliminary in nature and will be repeated before definite conclusions are published. However, it may be said that the experiments indicate that storage in an amber-colored bottle at a low temperature (about 10° C.) preserves the virulence of virus for a longer period than storage at higher temperature or in the light. Little difference was noted between virus kept in stoppered and that in unstoppered bottles. Virus which had been attenuated by heating to 60° C. for 15 to 30 minutes, remained virulent for over 6 months.

Experience with methods of inoculating against fowl pox, has confirmed the observations of others that the "stick" method is fully as satisfactory as the "feather follicle" method and less liable to result in the unfortunate losses which sometimes occur when the inoculating is done by workers without much experience or training.

Coccidiosis of Poultry. In the study of this disease, an attempt is being made to determine the viability of the coccidium in the soil under varying conditions of soil moisture, type, and treatment. Four plats have been prepared; one on high dry ground with sod covering: one high and dry, proughed and disked; one dry with a 4-inch gravel covering; and one on low damp ground. Birds infected with coccidia have been placed on each of these plats. Determinations will be made in succeeding years as to the presence and virulence of coccidia surviving from season to season.

Blackhead of Turkeys. A study of the etiology of the disease has occupied most of the attention this year. There has been considerable dispute concerning the causative agent of this disease and it was felt necessary to establish the identity of the organism before confidence could be placed in any therapeutic agent or system of control. The 1931 experiments have confirmed the work of Dr. E. E. Tyzzer of the Harvard Medical School that *Histomonas meleagrid's,* a protozoan organism, is the causative factor.

The 1931 work was hampered to quite an extent by an epidemic which occurred among the young turkey stock. The disease appeared while the poults were still in the brooders among lots of from 2 to 6 weeks of age, and resulted in the loss of 90 per cent of the

birds. No characteristic lesions were discovered. However, a bacterium was isolated from a number of the birds which, it is believed, was the causal agent. This organism has not been completely identified except that it is a member of the bacterial genus *Salmonella.*

Inheritance of Body-Weight in the Domestic Fowl. The data from investigational work carried on at this station from 1921 to 1926 with a cross between the Leghorn and the Brahma breed, has been analyzed by Nelson F. Waters under the direction of W. E. Castle of Harvard University, and published as Bulletin No. 228 from this station. A working hypothesis is presented in this bulletin which will account satisfactorily for the inheritance of body-weight in the Brahma-Leghorn cross of domestic fowl. The interpretation of the data is that the difference in weight between these breeds is dependent chiefly on two pairs of genes, each of which affects the weight of the individual equally and which together have cumulative effects.

Chemistry

Soil Nitrates and Vegetable Crops. For confirmation of results obtained in 1930, the growth season of garden beets was again divided into three approximately equal periods and 21 different combinations of low (10 parts of nitrogen per million of soil), medium (25 p. p. m.), and high (50 p. p. m.) levels of soil nitrate nitrogen were compared on the basis of production of salable roots. The beets were grown in cylinders containing 7 inches of soil above a 2-foot layer of sand, and the desired nitrate levels were maintained by biweekly analysis of the soil and replacement of nitrate losses by applications of nitrate of soda in solution. The soil was limed and sufficient superphosphate and sulphate of potash added to make a 5-8-7 fertilizer when used with the greatest quantity of nitrogen that it was estimated would be required to maintain the higher levels. The number of plants in each cylinder was the same as that grown on an equal area in the field.

The results for the 2 years show a decided correlation between the total seasonal application of nitrogen and yields of salable roots. Nitrogen applied during the first two periods proved more efficient than late applications. Levels of less than 10 p. p. m. of nitrate

nitrogen in the soil for any two of the three periods failed to provide sufficient nitrogen for a satisfactory yield. Optimum yields for both seasons resulted from the maintenance of 25 to 50 p. p. m. of nitrate nitrogen in the surface soil during the first two periods, and no further applications during the last period. Increasing the levels to 50 p. p. m. and to 75 p. p. m. throughout the season gave small increases in yields but at a disproportionate requirement for nitrogen.

Low, medium, and high soil-nitrate levels, as defined above, did not effect significant differences in the weights of fall beet seedlings until the fifth week after planting.

Soil Nitrate Levels and Certain Fractions of Nitrogen in Plant Juices. Previous work has shown a high degree of correlation between soil nitrates and the nitrate fraction of the nitrogen in the juice of plants, but this work has been conducted under conditions of nitrate feeding. Beets were grown in beach sand in the greenhouse during the past winter. Three combinations of nitrate and ammonia nitrogen designed to provide equal quantities of available nitrogen were applied in solution to maintain the following levels, calculated to parts of nitrogen per one million parts of dry sand: 25 p. p. m. of nitrate nitrogen; 20 p. p. m. of nitrate nitrogen with 5 p. p. m. of ammonia nitrogen and 5 p. p. m. of nitrate nitrogen with 20 p. p. m. of ammonia nitrogen. The levels were maintained by biweekly analysis followed by applications of the proper form of nitrogen to replace the losses noted. The relationship among the yields was 90:100:72 for the treatments in the order mentioned above. The relationship for total nitrogen applications was 100:-100:88. Analyses of the juice expressed from plant leaves,—midribs removed—show that sufficient supplies of available ammonia nitrogen disturb the correlation between nitrate nitrogen in soil and plant. For 5 of the 8 weeks during which the determinations were made the nitrate accumulations in the juice from the low nitrate treatment were approximately as great as those from high-nitrate feeding. Only during 2 weeks near the end of the growth period did the high ammonia plants reduce materially the abundant supplies of nitrates in their juice. On the other hand, a positive correlation appeared between ammonia nitrogen in soil and plant under these conditions. Evidently beets used ammonia in their metabolism

in preference to nitrates when both were available, leaving nitrate accumulations as a reserve. No consistent differences were noted for the amino and amide-nitrogen fractions.

The effect of thinning beets on yields and on the concentrations of nitrogen fractions in the juice was studied. Nitrate-nitrogen levels of 10, 25, and 50 p. p. m. were maintained in the soils of 1/1000 acre areas. Beets were planted in rows 14 inches apart. When the seedlings were well up, certain areas were thinned to leave 4 inches between plants, others to leave 2 inches. Each plant was pulled when the root reached a diameter of 2 inches.

Both thinning and increasing the nitrogen supply hastened the rate of maturity. After 2 weeks of harvesting, only 47, 51, and 62 per cent as great weights of beets had been removed from the more thickly seeded areas representing the 10, 25, and 50 p. p. m. levels as from the areas containing one half as many plants. Two weeks later nearly all of the plants on the areas with 4-inch spacing were ready for market, while the comparative weights pulled up to that time on the areas with 2-inch spacing were 71, 91, and 96 per cent for the three nitrate levels. These results also show the effect of increased nitrogen. The larger number of plants grown on the areas with 2-inch spacing continued to produce marketable beets for 3 weeks after all beets were removed from the thinned areas. Thinning hastened maturity but decreased yields. Nitrogen fertilization hastened maturity and increased yields.

Increasing the nitrate supply increased the nitrates in the plant juice. Increasing the plant population did not decrease this supply consistently. Nitrates in juice from the leaves minus midribs were low throughout the season, and differences between different rates of nitrogen feeding were too small to afford satisfactory indices to the growth rates. Nitrates in the juice from stems and midribs were approximately ten times greater, and week by week fluctuations were less. This conducting tissue may prove a better source of samples than blades for the purpose of the experiment.

The effects of the three nitrate levels on ammonia, amide, and amino nitrogen were not consistent.

Several methods for estimating ammonia nitrogen in plant juices have been prepared. A sharp change in the rate of evolution during aspiration at room temperature has been noted after 1½ to 2 hours.

This change is interpreted as marking the division between the so-called free ammonia and the part that has progressed further in the metabolism processes. The aspiration method as shortened by Van Slyke by the use of heat, or the Vickery method of 8 minute distillation with magnesium oxide approximates the same separation. Folin's permutit method perhaps shows the greatest promise from the standpoint of ease of manipulation and time requirement, but the adaptation of this method to plant juices has not been perfected.

Different Chemical Fractions of Buckwheat Roots and the Growth of Cos Lettuce in Pots. The progressive removal from dried buckwheat roots of the portions soluble in ether, water, alcohol, dilute acid, and concentrated acid had little effect on the growth of Cos lettuce following the incorporation of the residues from the extractions in pots. The addition of untreated roots increased the growth of the crop and a toxin that sometimes appears was not noted. Removal of the ether soluble fraction from the dried roots proved distinctly beneficial, but the subsequent extractions destroyed the advantage from ether extraction alone.

In an attempt to trace the rate of decay of buckwheat roots by methods proposed by the N. J. Agricultural Experiment Station, the quantities of sugar in soil were found to be too small for accurate estimation by the usual volumetric or gravimetric methods. Folin's colorimetric method was found to be applicable if the iron and aluminum is first precipitated by sodium carbonate, and the filtrate adjusted to pH 7.

The Readily Available Phosphorus of the Soil. The quantities of soil phosphorus soluble in dilute sulphuric acid and ammonium sulphate solution as suggested by Truog of the Wisconsin Agricultural Experiment Station for measuring the readily available phosphorus in soil have been found to correlate well with fertilization of the local experimental plats with superphosphate. Basing judgment on the growth of crops, the method gives too great value to accumulations from floats in this soil. Further study is required to show whether the minimum limit of 75 pounds per acre of phosphorus soluble in this solution that has been suggested tentatively for Wisconsin is applicable in Rhode Island.

Home Economics

The Rural Homemaker in Washington County and Frequency of Paid Work. Data concerning gainful occupations have been collected and tabulated from more than 550 homemakers in Washington County. In addition to facts concerning the methods and amounts of wage-earning, information has been secured concerning the amount of help in household tasks given by paid helpers or by members of the family and the use of outside agencies such as the commercial laundry, cannery, bakery, and clothing factory. Equipment which saves time and labor in homemaking is also listed, such as washing-machines, running water, central heat, etc. The large variety of ways as well as the number of women earning have proved surprising. One interesting fact, already evident, is the comparatively slight effects of the present business depression on the possibilities of earning by women. Except for those working in the mills, there has been no general reduction of employment and even these have had, in most cases, at least part-time work. The number of cases in which the homemaker's cash income has been the factor which has made it possible for the family to weather the present financial situation is also a very interesting point. The amount of money remaining in the county due to services which women render to summer residents or tourists is also proving surprisingly great.

Potash Fertilization as Related to Mealiness of Potatoes. Bulletin No. 231, was published incorporating the results of an additional year of experiments on potatoes with those reported in the annual report for 1930 and published during that year in an article in the American Potato Journal, Vol. VII. No. 10. The additional data did not alter the conclusion that a more mealy potato results from a fertilizer containing a large amount of potash. Also that the mealiness of the potato does not seem to be related to its starch content. Additional tests made with three varieties of potatoes to determine whether there was any marked difference in desirability after cooking, from the standpoints of color, flavor, or texture, also continued to give negative results.

Household Equipment Studies. As a result of experiments to determine the efficiency of pouring utensils several principles have been proposed. Utensils shaped to incorporate these principles are now being made. When these have been tested the project will be

completed. It is hoped from the results of this study that some simple variations producing greater efficiency will be adopted by utensil manufacturers and that for syrup a new type of pitcher may be developed which will be found to be much more efficient.

Influence of Fertilizer Treatment on the Vitamin Content of Spinach. Improved equipment for drying vegetables has made it possible to prepare more satisfactory samples of dried spinach for the cooperative experiment with Pennsylvania State College. There, members of the department of biochemistry are feeding to rats these samples of spinach grown under varying conditions of phosphorus, potassium, nitrogen, and manganese fertilization, to test for variation of Vitamin A content.

Plant Physiology

(Glasshouse Experiments)

Winter Tomato Culture. During the third year of the experiment to determine the relative growth and yield of winter tomatoes on a soil to which various kinds of organic matter were added, two crops were grown. As has been noted in a former crop, cow manure and horse manure gave the best growth and yield, adco-treated oat straw came second, and neutral peat and vegetable compost gave the lowest yields.

Winter Gladiolus Culture. Alice Tiplady and Maiden's Blush plants and corms grown under glass were harvested at different stages of maturity; some having the tops removed immediately after harvest and the tops of others being allowed to dry out before topping. These corms were planted at a later date and growth and flower yields recorded. It is concluded that there is little to gain by either of the above procedures over the other. Differences in flower and corm yields were not significant. Chemical analyses gave data showing accumulation of condensed forms of carbohydrate and nitrogen compounds stored partially in the corms. These additional amounts were apparently not great enough to influence the growth or flower yield of the succeeding generation of gladiolus.

Pot tests were made in order to determine the fertilizer response of gladiolus. Corms of No. 1 size or larger, which had passed through a sufficient rest period, were grown in beach sand to which varying combinations of nutrients were added. The flower yields

showed no significant differences demonstrating the presence of sufficient nutrients in the corms for good growth. Two crops were grown with similar results.

Both primulinus and large flowered varieties were grown in soil in pots using corms which were secured from California and which had a sufficient rest period. One half of the cultures were exposed to an additional 5 hours of artificial light from a 1000-watt nitrogen bulb. The other cultures received no supplementary lighting. No appreciable difference was noted in growth but the cultures receiving the extra light were increased 88 per cent in flower yield demonstrating the need of additional light for the blooming of winter gladiolus.

Availability of Ammoniated Phosphates. In cooperation with the American Association of Official Agricultural Chemists the availability of certain new forms of fertilizers was estimated by the growth of oats, millet, and turnips in pot cultures. The fertilizers in question are being manufactured by ammoniating superphosphate and if placed on the market may serve as cheaper sources of nitrogen. The relative availability of the phosphorus as averaged for the three crops was as follows:

Superphosphate	**100**
Ammoniated superphosphate	**78**
Dicalcium phosphate	**86**
Tricalcium phosphate	**57**
Calcium hydroxyphosphate	**16**
Tennessee Brown Rock phosphate	**9**
Fluorapatite	**8**

It would seem therefore that the ammoniated phosphates may serve as excellent sources of phosphorus.

Nutrient Needs of Grasses. When the growth of redtop, Rhode Island bent, and timothy plants in solution cultures was depressed approximately 40 per cent by low amounts of potassium, nitrogen, or phosphorus, the root to shoot relation varied. With low potassium the per cent of roots to total weight of plants was 20 per cent and 40 per cent for nitrogen and phosphorus.

Pomology

(Experiments with small fruits)

Fertilizer Experiments with Brambles and Grapes. Station Bulletin No. 229 gives the results of a preliminary experiment in con-

nection with the response of red raspberries to fertilizer nutrients. In general, the most marked response has been to potash and the Latham has proven to be the most hardy variety.

An elaborative experiment with the Latham variety and different levels of fertilizer, check plats, and replications is under-way on a different soil type. A further study of these factors is being made by means of pot tests where moisture conditions can be more closely controlled.

For the first time since the beginning of the fertilizer experiment with grapes a measurable crop was secured. Even this season, the Brighton which replaced the Delaware in 1928, can hardly be classed as having yielded a comparable crop. Concord and Niagara varieties bore good crops and the yields were as follows:

Plat	Fertilizer	Pounds	Ounces
204	No nitrogen in the fertilizer	164	3
205	No phosphoric acid	232	12
206	Complete fertilizer	252	6
207	No potash	149	4

So far as this year's yields give any indication of results in the response of grapes to the presence or absence of any of the three fertilizer elements, the plants have given markedly reduced yields where nitrogen and potash have been left out as compared with plants receiving a complete fertilizer and but little reduction where nitrogen and potash were present but phosphoric acid was left out.

Graftage Congenialty of Grapes. Several hundred grafts of tender vinifera or less vigorous hybrids were made on vigorous hardy stocks. It is generally advised by American writers on propagation not to use wax in grafting grapes but this necessitates planting deep so that graft union and even the cion can be covered almost entirely with moist soil. Unless careful attention is subsequently given to such grafts, cions may strike root and the stock root will cease to function, frustrating the purpose for which the grafting is done. An effort is therefore being made to find a way of covering the grafts so that they can be planted with the unions above ground in order to prevent the formation of cion roots.

The grafts were handled by three methods:

1. The grafts were tied with raffia only.
2. Tied with raffia and the cion and graft unions were covered with paraffin wax.
3. Tied with raffia and covered with a black wax of heavier body containing rosin.

European workers in vinifera grape grafting advise storing grafts, when made, in a callusing room but as no such room was available, our grafts were heeled-in in a sheltered place exposed to the sun during a large part of the day and completely covered with soil and leaves. As soon as ground was ready they were moved to the field and planted in nursery rows. No junction had been formed between cion and stock at the time of planting although some of the grafts had been heeled-in for over a month. In many cases the graft union became loose in handling or from weakening of the raffia and had to be retied. At the time of planting there followed several days of unseasonably hot weather. The temperature was sufficiently high so that the paraffin wax melted off leaving no protection for the graft joint or to check evaporation from the cion during the hot weather. The results were distinctly disappointing. Of a total of 682 grafts which were made with no wax, or with paraffin wax, not a single cion united with the stock. Of the 204 to which a black rosin was applied, 47, or 23 per cent, were found alive in September. In view of the fact that writers on grape grafting say that from 5 to 70 per cent of grafts made under favorable conditions may fail to grow, the results with the black wax under our conditions apparently indicate that there is a field for further work in the study of methods of handling grape grafts or of covering graft unions in grape grafting.

Blackberry Breeding Experiments. An unusual amount of rainy weather at the time when plants were blossoming out-of-doors early this summer interfered greatly with crossing work and also reduced the number of manipulations which resulted in fruit. Forty-four crosses were made and of these only 11 produced fruit with fully formed seed. During most of the time when the weather was sufficiently dry to permit crossing work, windy conditions prevailed and this raises the question as to whether the crosses made are limited to the results of mechanical transfer of pollen between recorded

varieties or whether wind-borne pollen may not in some cases have effected fertilization. Weather conditions apparently also affected natural self-fertilization for out of 25 blossom clusters covered for self-fertilization only three produced fruit.

Nut Tree Propagation and Culture. Work has been continued in propagating black walnut and hybrid hickories with results approximately the same as during the year previous. Varieties grown are apparently hardy so far as conditions for the past 4 or 5 years can indicate and the success with whip and cleft grafting has been sufficiently satisfactory so that propagation of plants for future work can be readily accomplished. This does not mean that the methods so far used give us the uniformly good results obtained with similar methods with fruit trees but it would seem to warrant the statement that multiplication of the best known varieties is readily possible and stock should be much less expensive than it is today when the demand for it makes larger scale operations in propagation possible.

OTHER ACTIVITIES

In addition to the experimental program of the year the station staff have closely cooperated with the Extension Service and other schools of the college in furnishing information to the public and setting up exhibits at county fairs and field days.

A second annual Field Day for golf greenkeepers was held with an excellent attendance. The agronomy plats and the poultry experiments on the East Farm were centers of interest at a farmers' Field Day arranged jointly by the Extension Service and the Experiment Station staffs.

Certain minor improvements in building and grounds have been made, chiefly on the East Farm. A water system which it is hoped will take care of all future needs has been installed on that farm.

Feed and Fertilizer Control Services

These two regulatory services are carried on by the Chemical Department of the station. An appropriation of $1,300 is received annually from the State Legislature to defray the expenses of the Feeding Stuffs Inspection. This appropriation does not provide sufficient funds for the analysis of all brands that are sold in the State. The law is archaic in several respects, notably that no guar-

anty is required for crude fiber. The number of samples analyzed has been increased during the past 5 years and the serious failures to meet guaranties have decreased during that time.

Funds for inspection of fertilizers are supplied by fees assessed against manufacturers. A strong effort is made to sample all brands used in the State. As for feeds, the number of samples have increased during the past 5-year period, and the percentages of serious deficiencies have decreased. This law also needs certain changes to bring it into agreement with those of other states.

The following table summarizes the work of the Feed and Fertilizer Control service for the past 5 years:

	Samples collected	Guaranties	Guaranties substantially fulfilled Per cent
Feeds:			
1927	113	223	95
1928	141	274	96
1929	212	422	94
1930	221	432	96
1931	221	343	98
Fertilizers:			
1927	109	267	91
1928	132	335	91
1929	151	373	94
1930	166	411	96
1931	185	439	97

Detailed reports of the inspections have been published, and are available for free distribution.

Egg-Laying Contest

On September 22, 1931 the First Rhode Island State Egg-Laying Contest came to a successful conclusion and the Second Contest is now underway. The contests are conducted as Standard Contests according to the rules and recommendations of the American Record of Performance Council. Fifty pens of 13 birds each were entered in the First Contest, the 10 highest birds to date in each pen being considered the actual contestants. The pens were distributed among the various breeds as follows: Rhode Island Reds, 23 pens; Single Comb White Leghorns, 18 pens; Barred Plymouth Rocks, 3 pens;

Jersey Black Giants, 2 pens; White Wyandottes, 2 pens; Buff Orpingtons, 1 pen; and Jersey White Giants, 1 pen.

The total production for the 51 weeks of the official contest was 93,486 eggs. These eggs won, on a weight basis under the official point system, 93,995.5 points. This means that the average points per egg was 1.005 or that the average weight per dozen was 24.10 ounces. Only two other contests surpassed the weight per dozen. This seems to indicate that the poultrymen of Rhode Island are paying attention to egg size as well as to egg production. The contest finished thirteenth among the 19 Standard Contests when ranked on average lay per pen. The pen rank for the leading varieties was as follows: Single Comb White Leghorns, ninth; Rhode Island Reds, third; Barred Plymouth Rocks, first and second; and White Wyandottes, sixth. The pen of Jersey White Giants, also captured second place among the miscellaneous breeds. Four birds laid over 300 eggs for the duration of the contest.

Weather

The growing season of 1931 was very favorable on the whole for nearly all crops, both with respect to rainfall and temperature. The spring months were characterized by above normal temperature and less than normal rainfall. This favored the planting of all early crops. The last frost occurred on May 4 with a temperature of 30° F.* On May 1 the temperature went down to 26° F. but no damage resulted to such crops as were germinated. The average precipitation was 2.08 inches below normal in April and 1.10 below in May. During June the average precipitation was 2.03 inches above normal.

The summer months of July and August were about normal for rainfall and a little above normal in average temperature. During September and early October the precipitation was considerably under normal and some crops began to show effects of the dry conditions. No serious damage resulted to any crop however.

The first fall frost occurred on October 10 with a temperature of 31° F. There were light frosts on several succeeding days and a heavier frost on October 13 causing damage to head lettuce, peppers,

* Climatological Data, New England Section, of the U. S. Dept. of Agriculture Weather Bureau.

and beets. The late fall was very mild and allowed all late crops to grow much longer than usual.

The departure from normal in rainfall for the growing season was as follows:

Month	Normal Inches	1931 Inches	Departure Inches
April	4.71	2.63	—2.08
May	4.17	3.07	—1.10
June	3.33	5.36	+2.03
July	3.47	3.73	+0.26
August	4.31	3.99	—0.32
September	3.50	1.03	—2.47
October	4.18	2.64	—1.54

The distribution of rainfall evidently was less favorable to seed setting in bent grasses than was the case in 1929 and 1930. The average yield of bent grass seed was only about a half of what it was in 1930 due chiefly to a poor set of seed.

Publications

Further evidence concerning the toxic action of aluminum in connection with plant growth. Soil Science 31: 267-273.

A negative correlation observed between the nitrate nitrogen in the juices of beet leaves and the weight of the leaves. Jour. Agr. Res. 42: 53-56.

Sampling market-garden soils for nitrates. Soil Science 31: 281-290.

Report on high analysis fertilizers. Jour. Assoc. Off. Agr. Chem. 14: 206-213.

Incidence of *Salmonella pullorum* in eggs from reactor hens. Poultry Science 10: 118-119.

Forty-third annual report of the station. Bul. of Rhode Island State College 26: 28-49.

A study of apple containers. R. I. Agr. Expt. Sta. Bul. 227, 14 p.

The sensitivity of red clover (*Trifolium pratense*) to small amounts of boron and manganese. Plant Physiology 6: 727-729.

Inspection of feeds. Annual Feed Circular, May, 1931, 12 p.

Inheritance of body-weight in domestic fowl. R. I. Agr. Expt. Sta. Bul. 228, 105 p.

The fertilization of red raspberries. R. I. Agr. Expt. Sta. Bul. 229, 21 p.

A study of the organization and management of Rhode Island farms. R. I. Agr. Expt. Sta. Bul. 230, 56 p.

Certain relationships of potash fertilization and varieties of potatoes to table value. R. I. Agr. Expt. Sta. Bul. 231, 16 p.

Inspection of fertilizers. Annual Fertilizer Circular, September, 1931, 17 p.

Inheritance of body-weight in domestic fowl. Nat'l Academy of Sci. 17: 440-444.

Utilization of citric acid and of sodium citrate by *Salmonella pullorum*. R. I. Agr. Expt. Sta. Bul. 232, 16 p.

Respectfully submitted,

BASIL E. GILBERT,
Director.

Kingston, R. I.
January 1, 1932.

RHODE ISLAND STATE COLLEGE
REPORT OF
THE EXTENSION SERVICE
1931

PRESIDENT RAYMOND G. BRESSLER:

Sir:

I am herewith submitting the annual report of the Extension Service of the Rhode Island State College for the year 1931 as carried on cooperatively with the United States Department of Agriculture and the district farm bureaus.

This report is a statement of the activities for the thirtieth year of agricultural extension work in Rhode Island and is presented in accordance with the laws requiring an annual report of activities.

A. ADMINISTRATION

Organization.

Set up as an integral part of the national Extension Service working in cooperation with the United States Department of Agriculture and the three Rhode Island farm bureaus, the Extension Service is organized for the purpose of carrying on work with men, women and children living in the rural communities. This work is at present conducted by a staff of workers consisting of a Director, who is also State Leader of County Agents and Dean of Agriculture in the College; two full-time State Leaders, one of them Leader of Home Demonstration Agents, and the other Leader of Boys' and Girls' Work; nine part-time Specialists, together with a staff resident in counties of nine agents, three Agricultural Agents, three Home Demonstration Agents, and three Boys' and Girls' Agents.

Cooperation.

The policy which has proven very effective in past years of conducting evening school sessions in cooperation with the State Board of Vocational Education has been continued. Seventy-three sessions were held in thirteen localities, with a total attendance of 684. The attendance recorded for the past year is an increase of fifty-six per cent in the past two years. The subjects for discussion at these sessions included animal husbandry, agronomy, fruit, and poultry.

The State Department of Agriculture has stood ready at all times

to render such assistance as was possible in solving the agricultural problems of the State.

Much assistance has been received from the workers in the Experiment Station especially along the lines of vegetable gardening and soil fertility problems.

Fair Exhibits.

The three farm bureaus, as in years past, have staged exhibits at the agricultural fairs in their respective districts. The past year these exhibits have covered a wider field than ever before and showed a greater excellency in staging. The exhibit showing the results of dairy herd improvement association work as staged by the County Agent in Southern Rhode Island proved very effective in calling the attention of the dairymen to the value of this type of work and its influence upon profits in the dairy business.

Exhibits have also been staged in some of the local poultry shows and the annual exhibit of the Rhode Island Fruit Growers' Association.

Sources of Revenue.

The income during the fiscal year ending June 30, 1931, as reported to the United States Department of Agriculture comprised the following items.

Federal Capper-Ketcham funds	$20,147.57
Federal Smith-Lever funds	11,680.24
State Smith-Lever funds	1,680.24

United States Department of Agriculture funds allotted to Rhode Island

County Agent Work	$2,610.00
Home Demonstration Work	2,460.00
Boys' and Girls' Work	2,808.00

The three farm bureaus have been financed from State and town appropriations together with membership fees.

By the passage of an amendment to Chapter 242 of the General Laws entitled "Of the Organization of Farm Bureaus and the Employment of Agricultural Demonstrators" which was approved April 27, 1929, the farm bureaus of the State are now by law obligated to present their plans of extension work for the ensuing year and to render to the Board of Managers of the Rhode Island State Col-

lege and the State Commissioner of Finance a full detailed report of extension activities for the preceding year, the financial reports to be on such forms as may be prescribed by the Board of Managers of the Rhode Island State College and the State Finance Commissioner. This amendment to the law authorizing farm bureaus, for the first time makes a definite connection between the farm bureaus and the State Extension Service.

Equipment.

New equipment consisting of photographic enlarging apparatus, filing cabinets, card index cabinets, and film strips have been added to the permanent equipment of the department. The equipment for use in fruit demonstrations has been materially improved by the purchase of many different types of pruning apparatus including saws and shears.

Personnel.

The following changes in personnel for the fiscal year July 1, 1930 to June 30, 1931, have taken place.

Miss Virginia T. Broome, Boys' and Girls' Agent in Southern Rhode Island resigned as of August 15, 1930. William R. Walker, a graduate of the Ohio State University, was appointed to this position effective September 15, 1930.

On September 15, 1930, Miss Dorothy M. Kenyon was appointed as Home Demonstration Agent in Southern Rhode Island to fill the vacancy caused by the resignation of Miss Nora M. Hott the previous February. Miss Kenyon is a graduate of the Home Economics Department of the Rhode Island State College.

September 1, George B. Durham, assistant professor of vegetable gardening and floriculture in the College was appointed part-time vegetable garden specialist in the Extension Service. Increasing demands for assistance in this type of work made this appointment necessary.

In the Smith-Lever Act providing for cooperative agricultural work the fundamental objective is people rather than increased efficiency of animals or greater production of crops. In order that the efficiency of the work as carried on cooperatively by the Rhode Island State College and the United States Department of Agriculture

be developed to the highest degree possible, the specialists and agents are being instructed to approach every problem with which they are confronted by asking three fundamental questions as the first step toward a solution. These questions are: "What is the situation?" "What are the problems?" "What is the solution?". In practically every case it will be seen that the solution cannot be brought about through the worker in a single project but must be cooperative among the workers as well as by the worker and people. Believing that this viewpoint will lead to greater efficiency every effort is being made to have the extension worker look upon the problem with which he is connected as one of better rural life and living rather than as one of a single product of the farm.

Publications.

Four bulletins and one circular have been published during the past year.

Bulletin No. 54, "What Price Farming?", an educational play by R. B. Corbett, December 1930.

Bulletin No. 55, Wheat as a Substitute for Corn in Animal Feeding, by John E. Ladd and C. P. Hart, November 1930.

Bulletin No. 56, Annual Report of Extension Service, 1930, by G. E. Adams, June 1931.

Bulletin No. 57, Grape Culture in Rhode Island, by E. P. Christopher, June 1931.

Circular No. 4, Spray Program for Peaches, Other Stone Fruits, and Grapes, by E. P. Christopher, April 1931.

A very important part of the publicity, as in previous years, has been the series of monthly mimeographed sheets. These sheets are now being sent to 2,865 individuals. The market garden information, which is issued monthly in circular form, is being sent to a selected list containing 400 names. The State office mailing list for the home economics work contains 1,200 names and that for the boys' and girls' work, 650.

News articles have continued to be a valuable source of publicity. More articles in relation to the Extension Service have been printed this year than ever before, especially in relation to the agricultural work.

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distribution on April 1. Not only was this campaign successful in so far as the reduction of the number of rats on farms was concerned, but also serves as the best illustration which we have yet had in the Rhode Island Extension Service of the value of complete cooperation in putting across a piece of work.

In the development of their work the agents have made 1,700 farm visits, received 1,913 office calls, answered 1,312 telephone calls, written 2,951 individual letters, published 180 news articles requiring a total of 842 days, 397½ of which were spent in the office and 444½ in the field. Each one of these activities shows an increase over that of the previous year.

Home Demonstration Work.

During the past year the work of local leader training schools has been given continued attention, with the result that at the end of the year there are sixty-nine organized groups working under local leaders in home demonstration work, with a membership enrollment of 2,024.

As a foundation upon which to plan more wisely their programs, the home demonstration agents have devoted more time than in previous years to making home visits and surveys of rural home conditions. As a result of this increased activity, 667 different homes have been visited during the year.

The State Camp held at the College June 23, 24, 25, and 26 served as a training school and source of inspiration to those seventy-seven women who were enrolled for the entire course. Three hundred sixty-two others took advantage of special items on the program by attending for one or more days.

Owing to a reduction of spending power in many homes during the past year more attention has been given to the foods and nutrition work than to any other line of effort, two hundred seventy-two days of the agents' time being devoted to this work. The next important subject as expressed in days' work was clothing, which accounted for 254 days. Special emphasis was placed in the foods work upon the development of a satisfactory diet based upon cheapening the cost of the individual meal; and in the clothing work emphasis was placed upon the use and selection of suitable materials and methods of garment construction.

On September 1 the State Leader and three Home Demonstration Agents inaugurated a radio broadcasting service in connection with the Office of Information of the United States Department of Agriculture. These "Housekeepers' Chats" as they are called are given at 12:45 P. M. Monday, Wednesday, and Friday, for a period of fifteen minutes and are made possible through the courtesy and cooperation of radio station WJAR, the Outlet Company, Providence. Judging from the requests which have been received for information as a result of these chats the broadcasts are furnishing a real service.

Our home demonstration work is restricted in its usefulness owing to the lack of sufficient funds to permit of the employment of subject-matter specialists as in the agricultural work.

Boys' and Girls' Work.

The year has shown continual improvement in the 4-H Club work of the State, especially in those phases of the work having to do with the development of local club leaders. During the past year county-wide leader conferences have been held, at which meetings discussions of methods and subject matter have been held.

An important development in the Club work has been the adoption of the plan to secure written outlines of work at the beginning of the year for each club and the requiring of the local club leader or secretary to be responsible for statistical summary and narrative reports of the club at the end of the year.

The number enrolled for three years or more in both the boys' and girls' groups has shown an appreciable increase during the year. The total enrollment sixteen years of age or above has shown a marked increase this year. In 1931 we had forty-nine standard clubs with approved plans of work as compared with four the year previous. During the past year there has been an increase in enrollment and in the completion of the agricultural projects, the percentage of completions being fifteen per cent higher than those reported a year ago. The greatest increase in interest in the agricultural project is being shown in the poultry and dairy club work.

Agricultural Economics.

Work in this project was commenced on July 1, 1931. According to the program adopted the activities will be conducted under the two general headings of marketing and farm management. During the

past six months the marketing work has been largely devoted to helping find solutions of the problems with which the local producers of the State are confronted. They have been assisted in formulating plans for the development of organizations for more efficiently marketing their products.

The farm management work has consisted in the tabulation and presentation of data collected in the farm management studies which have been carried on in the past by the Experiment Station workers and the County Agricultural Agents. Assistance in inventory and accounting work has been rendered to individual farmers. As the work in agricultural economics develops it should become one of the most important extension projects.

Agronomy.

The decreased income of the dairy farmers of the State due to the lowering of the price received for milk has attracted attention to the necessity for cheaper production. As a result, the agronomy work has shown marked advances in the spread of recommended practices as related to the production of home grown forage; particular pains have been taken to show the dairymen that there were legumes which were adapted to all types of soil from those of a relatively high degree of acidity to those approaching neutrality. Farm management studies of previous years showed conclusively that the failure to adopt recommended practices was frequently due to a lack of financial resources. Recommendation that a dairyman increase his acreage of alfalfa, when, in order to successfully grow this crop, an expenditure for lime would be required amounting in many cases to at least $25.00 per acre, if the crop is to be grown successfully, was shown to be an impossibility after considering the farm and labor income of many individuals. However, by growing legumes adapted to soils deficient in lime, it was found that a high quality protein hay could be grown at a relatively small expense. The agronomy work this year has stressed the point that the legume problem is an individual farm problem and that recommendations must be made upon the basis of soil tests conducted upon each farm.

The silage corn variety studies have given very interesting results, showing that on our Rhode Island farms, by the proper choice of varieties, as high as six tons of dry matter may be produced on an

acre. The importance of selection of proper varieties was well brought out in a test on one farm where the yield of dry matter per acre varied from 4.4 tons for the low yielding variety to 6.44 tons for the high yielding variety.

Animal Husbandry.

The outstanding animal husbandry work for the year has been the work with the dairy herd improvement associations, two of which were organized and commenced operations in November 1930. The association in Northern Rhode Island operated on a bi-monthly plan; the Southern Rhode Island association on the monthly test plan. Fifty-one herds were enrolled. The average production by the 737 cows in the Southern Rhode Island association was 6,606 pounds of milk with an average test of 3.9 per cent butterfat. The average production for the 893 cows in the Northern Rhode Island association was 8,110 pounds of milk testing 3.7 per cent butterfat.

In spite of the depressed condition of the dairy industry these two associations have reorganized for the second year, the Northern Rhode Island on a monthly basis employing two testers and the Southern Rhode Island association continuing with an addition of three herds to its membership.

Much emphasis has been placed upon better feeding methods during the past year.

Fruit Growing.

The spray service which was inaugurated in 1930 was continued with a definite enrollment of 213 fruit growers. As last year, information as to date of making spray applications was sent to those enrolled by mail and telephone from the county agents' offices. In addition to the personal service the spray information was broadcast over the radio.

The importance of removing and cleaning up harboring places for insect pests and the overwintering stages of plant diseases was shown in an orchard where the spray program did not seem to be efficient in controlling certain insect pests. In this orchard a check was made as to the extent of curculio damage on trees next to a stone fence and a brush heap which furnished excellent harboring places for the pest. The tree nearest the stone fence showed eighty per cent cur-

culio injury, this injury decreasing progressively from the source of infection until in the tenth row from the fence it had fallen to twelve per cent. The same number of sprays were used on all trees. In the year's program of work attention was given to soil problems in relation to fertilization and maintaining of humus supply, demonstrations being started in the application of fertilizers and cover-cropping.

Continued interest has been shown in the grafting and pruning work which has necessitated devoting considerable time to method demonstrations.

Poultry.

As in years past disease and sanitation work has received the major attention in the poultry project. As was to be expected in view of the serious break in prices of poultry and poultry products at the beginning of the year there was a material decrease in the number of chicks hatched and raised in the State. As a result of the change of attitude toward the growing of poultry the number of poultrymen enrolled in the Grow Healthy Chicks campaign showed a decrease in numbers for the first time since the establishment of the project. In 1930, 252 poultrymen reported the results obtained in growing 208,749 chicks as compared with 227 growing 142,312 chicks in 1931. In spite of this decrease in numbers, the number of chicks grown without loss from disease increased from 10,690 to 27,138 and the number of poultrymen reporting no loss increased from twenty-five to forty-six. The value of the Grow Healthy Chicks campaign to the poultrymen of Rhode Island is shown in the constant and decreased percentage of mortality in flocks since the inauguration of the work, decreasing from 18.1 per cent in 1927 when the work was started to 7.65 per cent this year.

The Pullorum disease has continued to take the greatest toll from the poultrymen of any one single disease. Testing the poultry flocks of the State for this disease in a systematic manner was inaugurated in 1925-26 when 8,175 birds on sixteen farms were tested showing 6.97 per cent of reactors. The past season, 1930-31, shows the number of birds tested to be 22,638 on thirty-three farms with a percentage of reactors of 4.08 per cent. In spite of this marked progress many of the larger poultry owners of the State felt that pro-

gress was not being made as rapidly as it should be toward the eradication of this disease. As a result of this feeling, there have been organized two poultry flock improvement associations having for their chief object the eradication of the Pullorum disease. These flock improvement associations are organized on somewhat the same idea as the dairy herd improvement associations, namely, that each association shall employ a man whose duty it is to test the birds in the members' flocks at frequent intervals until the disease is eradicated. The development of the short methods of testing have made these organizations possible. At the present time the two associations have enrolled thirty-five individuals owning 50,036 birds. In so far as is known the formation of the Southern Rhode Island Poultry Flock Improvement Association on August 5, 1931, in accordance with plans developed by the Extension Service, was the first organization formed in the United States for the systematic control of this disease.

The development of record keeping of egg production and studies in cost of production have been continued.

Vegetable Gardening.

The vegetable gardening enterprise divides into two very distinct lines in our State; first, commercial growing of vegetables; and second, the growing of vegetables for home consumption.

The commercial group at present are more interested in problems connected with distribution than with those of production, with the result that the specialist is doing little work with this group except in answering inquiries having to do with meeting emergency situations such as outbreaks of disease or insect pests. The type of problem presented by the commercial grower is illustrated by the case of one spinach grower who had a relatively large acreage which developed "yellows". The crop was saved for marketing by the advice of the Vegetable Gardening Specialist to use the manganese sulphate treatment. As a result of this treatment, the crop was developed to a marketable stage and the owner convinced of the value of soil testing.

The second group, those growing vegetables for home consumption, are reached quite largely through the assistance rendered by home demonstration agents and the boys' and girls' agents in prepara-

tion of subject-matter material and plans of home gardens for their use.

In the program for the ensuing year greater stress will be placed upon the problems of the commercial grower, although with the present agricultural situation much attention must, of necessity, be given to the development of a larger supply of home grown vegetables in order to reduce the farm family expenditure for food.

Outlook.

Never in the history of extension work has the opportunity for service on the part of the extension staff to the rural population of Rhode Island been greater than at present with an ever increasing confidence in the work and teachings of the Extension Service and a better understanding of its aims and objectives through the development of long-time programs founded upon a study of local problems with small groups. The years immediately ahead give promise of closer relationships between groups than ever before, founded upon a better understanding of mutual problems.

No annual report of the Extension Service would be complete without an expression of appreciation of the spirit of cooperation shown by all of those who have been called upon to assist in the work during the past year.

Respectfully submitted,

G. E. ADAMS,
Director.