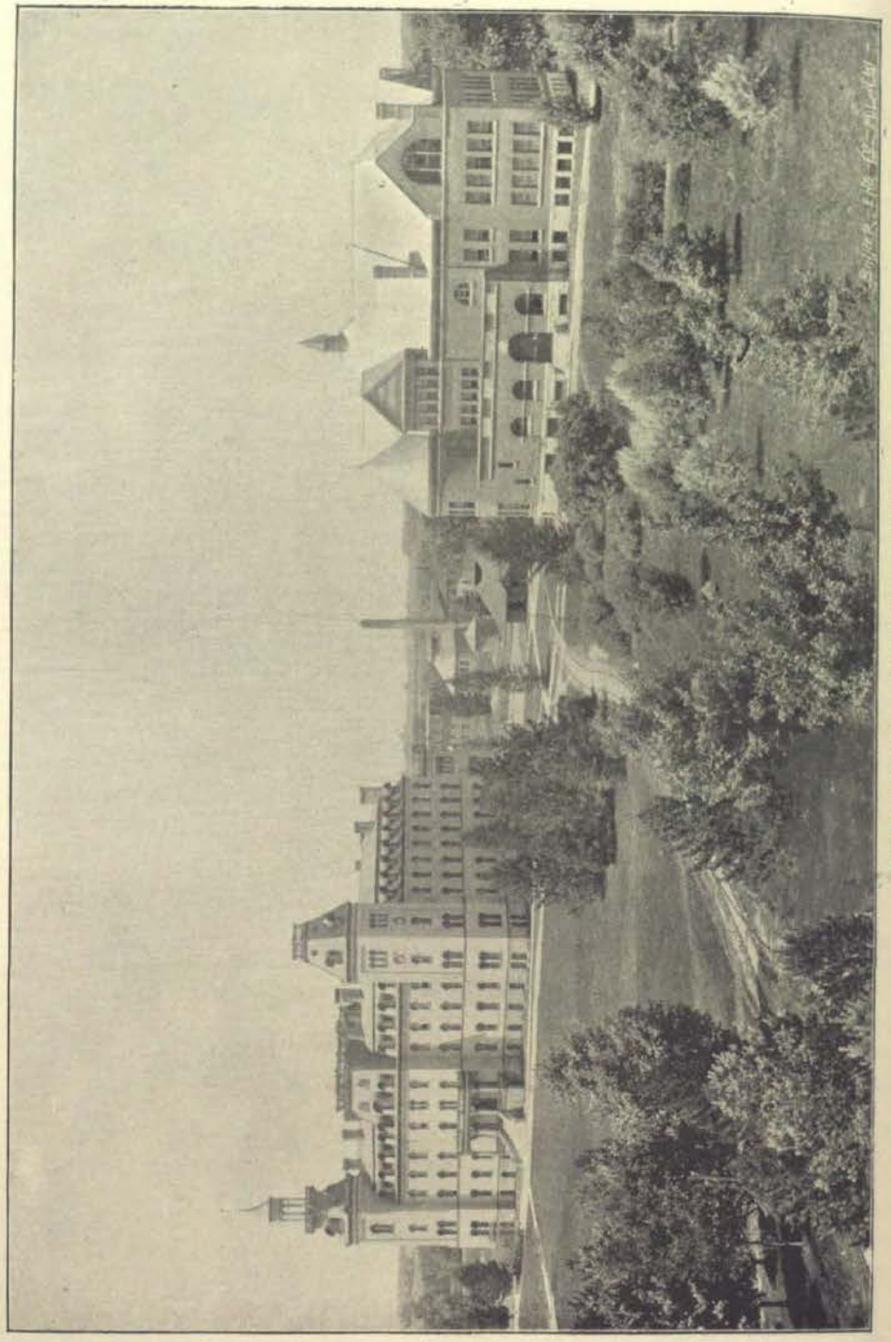


MAIN BUILDING AND MORRILL HALL.

FIFTEENTH BIENNIAL REPORT

OF THE

BOARD OF TRUSTEES

OF THE

Iowa State Agricultural College and Farm

MADE TO

THE GOVERNOR OF IOWA,

FOR THE YEARS 1892 AND 1893.

PRINTED BY ORDER OF THE GENERAL ASSEMBLY.

DES MOINES:
G. H. RAGSDALE, STATE PRINTER.
1893.

STATE AGRICULTURAL COLLEGE,
AMES, IOWA, December 1, 1893.

To His Excellency, HORACE BOIES:

In accordance with the statute defining the duties of the Secretary of the Board of Trustees of the Iowa Agricultural College, I have the honor to transmit herewith the Fifteenth Biennial Report of said Board.

E. W. STANTON, *Secretary.*

REPORT OF THE PRESIDENT.

To the Board of Trustees of the Iowa Agricultural College:

GENTLEMEN—I have the honor to submit to you for his Excellency, Horace Boies, Governor of Iowa, and for the citizens of Iowa, my second biennial report. In this period there are many things to encourage, and few to discourage. Without exception our departments have been marked by growth and thrift. Upon the part of students and faculty alike the years have been characterized by healthful enthusiasm and noted progress.

THE ATTENDANCE

of students during the last two biennial periods is most gratifying. During these years the enrollment has been as follows;

1890—336 students. An increase of 52.
1891—425 students. An increase of 89.
1892—547 students. An increase of 122.
1893—620 students. An increase of 73.

The enrollment for 1889 was two hundred and eighty-four, so that the attendance of the college has more than doubled in the last two biennial periods.

THE STATE OF THE COLLEGE

is, upon the whole, encouraging. The work of the faculty is characterized by a spirit of unity and growth. The students, as a body, have put in faithful work, with the exceptions that always occur. With slight variation the biennial period has been marked by hearty co-operation of students and faculty. The teaching of the faculty shows fresh study, new zeal, and still higher ideals of thought and work. The tone of the entire college is improving. Our college spirit is taking on a loftier dignity. For the most part the students have been well disposed to government and order. For the first time in years the freshmen and sophomores did away with the old barbarous custom of a rush for class picture. They had, instead, literary exercises, and banqueted each other in turn with a manner more in

accordance with scholarly purpose and training. The general response of the students in a spirit of co-operation with the authorities for a higher student life is highly commendable, and gives promise of still better things to come. The alumni, by their success and attainments, are rapidly bringing credit and standing to the institution in the walks and ranks of life. The people throughout our State are more awake to the interests and mission of the College. Upon the whole, we can take heart for still better things to come.

THE APPROPRIATIONS GRANTED BY THE LAST LEGISLATURE

have been carefully husbanded and judiciously expended. The new agricultural hall is one of the finest on the campus. The $35,000 appropriated for this purpose was expended in this building as will appear in the subjoined report of the secretary. The building is composed of stone through the basement and second floor and the rest is made of brick. The building is four stories and a basement, with a ground dimension of sixty-four feet by one hundred and six feet. The basement is devoted to horticulture. Therein the winter work in horticulture is prepared and preserved. This is constructed so as to drive in with a team on one side and out at the other, making a most convenient arrangement for the purpose. The first floor above the basement is given, in the west half, to the department of agricultural chemistry. Testing and experimental laboratories are herein provided. The east part of this floor is given to general bulletin room and grafting room of horticultural department. There also is a live stock room for class purposes in which an animal of the farm may be brought before the class and adjudged according to the most recent methods of becoming acquainted with farm animals from life.

The second floor is devoted to offices for Professors Wilson, Kent, Curtiss, Hensen and Budd, and recitation rooms for agriculture and horticulture.

On the third floor there are offices for Drs. Stalker and Niles of the veterinary department, bacteriological laboratories, two recitation rooms for veterinary department and a room for agricultural museum.

The fourth floor is a half story and probably these rooms will be employed for some of the literary and scientific societies of the college. The building is heated throughout by steam. It has one of the most commanding locations on the campus and is in every way a credit to the State and an inspiration to our work.

The amount appropriated for the creamery and repairing farm barns enabled us to finish the dormitories above the creamery, put in cement floors, to finish the large work room in the creamery, a room and laboratory for the professor of dairying, and put the main part

of the creamery in good working condition. Some of the most needed repairs to the farm barns could not be carried to completion because there was not a sufficient amount of funds appropriated, but the fund was extended as far as economy would dictate.

The appropriation for repair and extension of steam heating and electric light plant proved most timely. The boiler in connection with Morrill hall was moved into the general boiler room just back of the main building, the old boilers lowered and replaced to much better advantage, and proper connections made for the heating of the main building and Morrill hall from this one center of boilers. This proves a decided economy. The heating plant of the creamery was extended to the dormitory rooms, thereby affording them safe and convenient heating. The boiler house roof in the rear of the main building had completely worn out and had to be replaced by a new roof. The wires of the electric light plant were replaced in some instances and the power and efficiency of the light greatly increased. There is still considerable to be done with reference to both of these plants.

The appropriation for repairing and extending the water works was expended in conveying the water supply, including tank pipes, etc., to the new Agricultural hall, in repairing and procuring pump for water works, in enlarging and improving the main well, in the purchase of additional hose for water works in main building, in repairing the water pipes in the main building, in conveying the water supply to the office building, in making a more adequate amount of water for North hall, in improving the water supply for veterinary department, for the cottages, and for the house of the assistant horticulturist.

The $12,500 appropriated for general purposes was employed in enlarging the office building, which gave additional and very valuable office rooms and greatly improved the entire building. Our general offices are now a credit to the institution and an honor to the State. The book department, postoffice, express office and waiting room in connection with the college and motor railway were provided out of this appropriation, so as to relieve our present and coming needs in these directions quite comfortably. The chemical and physical laboratories were greatly improved, though we did not have a sufficient sum to entirely complete them. The walls of the chapel, museum, library, recitation rooms and office rooms of Morrill hall were frescoed and finished. The cellar of the main building was very deficient in drainage and sewerage. This was thoroughly overhauled and put in first-class condition. The sewerage in other parts of the campus was also greatly improved, including extension into Morrill hall and the office building. A complete record of our system of

sewerage is kept in the archives of the College for future reference in case of repairing and extensions. Some of the rooms in engineering hall were white coated and finished and put in a much better condition. The farm buildings were also repaired out of this fund. Important improvements were made upon south hall. Our old ice house had become worthless and we had to provide a new one. In moving the house formerly occupied by Prof. Budd, to make way for the new Agricultural hall, a number of repairs and improvements had to be made to the house out of this fund. The barn and the house in connection with one of the farm tenants was moved to a more suitable location and put in better repair and condition. The electric light and heating plant also received important help from this fund. The college hospital and veterinary hospital were repaired from this source. A detailed statement of all these expenditures will be found in the financial report of the secretary. The financial statement will show a general expenditure, including improvements and repairs during the last biennial period, of near $70,000. All of this has been a much needed expenditure and adds much to the permanency and strength of our work. But there is still much more that should be done in the immediate future by the way of new buildings, repairs and improvements.

URGENT NEEDS OF THE COLLEGE.

As trustees and faculty we have gone over the needs of the various departments and selected the things that are most urgent. All of these are important, and should be supplied at once.

WATER SUPPLY.

Our water supply is very limited and deficient. Our water system was primarily designed for the wants of several hundred people. We now have over twice the number of people to be furnished water by this system, and there has been no increase in its capacity. The apparatus and piping have become quite defective by use and age, so that it is not up to its original working capacity. The engine used for pumping has given out entirely. The storage capacity for water supply is too limited and inadequate. The water pipes are deteriorating rapidly and require patching and replacing. The pipes are entirely too small and create a vast amount of loss through friction. Our sewerage system cannot be thoroughly effective until water is available, and when you have six or eight hundred people closely assembled together a generous water supply is most needful in order to insure the health and welfare through proper sewerage. Our bath rooms for students are in need of more water. The hospital supply

is also much cramped. Morrill hall and agricultural hall, our newest buildings, must have additional water facilities. The work of the laboratories is more than double in the last few years, and a liberal supply of water to most of these is absolutely necessary. Our creamery makes very large and rightful demands for water. We have several hundred thousand dollars' worth of buildings in constant use by many different persons, and we should have more than an ordinary provision of water for the protection of these from fire, but with our present supply these buildings have not a good ordinary safeguard in case of fire. We have water of an excellent quality, apparently in abundance, coming from springs located on the farm.

We have had a couple of expert engineers take proper data and make calculations as to a new water system. The proposed system comprises a pumping plant with a capacity of one hundred thousand gallons in eight hours, and drawing its supply from these springs and wells. Our demands for water in the immediate future are from sixty to seventy thousand gallons per day, so that a system providing for one hundred thousand gallons in the face of our present growth would soon be used to its fullest capacity. This would give us ample defense in case of fire to all the college buildings and adequate water supply for thorough sewerage, for the extensive uses of the creamery and laboratories. We have plans, maps and profiles made by one of our professors in civil and mechanical engineering, showing in detail this proposed system, which will be at the service of parties properly interested in the matter. The entire matter, including tower, steel or iron tank with a capacity of 193,000 gallons, wells, pumping plant, mains and hydrants, is carefully estimated at $21,500.

LADIES' HALL.

For a number of years the attention of the legislature has been called to the need of a hall for our young women. With the large increase of students this has become a most imperative and vital need of our work. We are too far from the town and neighboring houses to provide successfully any other method than a dormitory. Situated as we are, we will be under the necessity of boarding most of our students on the college grounds for some time to come. The urgent need, last legislature, of the Agricultural hall, which had been unaccountably delayed for years, gained the ready assent of preference on the part of our authorities in the hope of having a ladies' hall without fail, from the hands of the incoming legislature. We then had an attendance of four hundred and twenty-five students for the year; we now have an enrollment of six hundred and twenty for the year, very nearly two hundred more, with a demand for larger

room corresponding to such an increase of students. Co-education has proved eminently successful in Iowa, both in State and private institutions. The daughters of our people are worthy of the very best provisions for wholesome living and worthy improvement of mind and manners. The State cannot reasonably afford to leave the young women of Iowa years behind the age in their boarding, rooming and social facilities when in college, merely for the lack of a few thousand dollars. We still need more living rooms for young men, more recitation rooms for our classes and more buildings for the increase of families. The building of a ladies' hall, embracing sufficient dining room for both young men and young women, would enable us make extra recitation rooms out of our present dining room, to make place for our young men in the quarters thus vacated by the young women, and by furnishing quarters for the department of domestic economy would leave South hall for the much needed occupancy of still another family or families. Such a building would cost $75,000.

ELECTRIC LIGHT PLANT.

We have made a number of marked improvements in our electric light plant the past year by changes in wiring, arrangement of the engines and dynamos. This enabled us, without overloading the power facilities to substitute sixteen-candle power lamps burning up to full brilliancy, for ten-candle power lamps burning at half brilliancy, and to reduce the coal consumption at the power station. The plant is now loaded to its capacity both as to engine and boiler. The dynamos could stand a slightly heavier load but not enough to prove nearly adequate to our present demands. The creamery dormitories, the new Agricultural hall and other rooms are unprovided with proper lighting. Our present lighting facilities, especially in the rooms of the students, are not what they should be.

Careful estimates have been made as to the extension of our electric light plant by the purchase of a boiler, dynamos and proper wiring. This would enable us to give much needed improvement to the rooms already lighted and supply the new buildings on the campus. The cost is estimated at $8,000.

REPAIRS ON MAIN BUILDING.

The two upper floors of the main building are in constant need of attention and repairs. The walls have been patched so frequently and the various parts of these rooms so mended that we cannot expect the most economical returns without a more thorough overhauling. They should be entirely rewooded and replastered. Some of them are too small and should be rearranged. They are far behind being suitable

living rooms for our young men and we occupy them merely from necessity. They are very extensive floors and quite a sum of money could reasonably be spent upon them, but in the immediate future there should be appropriated for repairs on these floors and other parts of the main building, $4,000.

FORGE SHOP AND FOUNDRY.

Our present forge shop is a sorry excuse of a structure. It is simply a little board shed attached to the rear of engineering hall, and would not sell for $30. The forges have no proper escape for smoke, and it is not as good a building as many a man has on his farm for a blacksmith shop.

The foundry is in an out of the way basement in engineering hall and wholly inadequate for our work. At a time when there were but a handful of students these temporary provisions for a forge shop and foundry did fairly well, but with a marked attendance in our engineering courses we are very much hampered for lack of advantages in these particulars.

A forge shop and foundry of even humble proportions are estimated to cost $9,000.

COMPLETION AND IMPROVEMENT OF CREAMERY BUILDING.

The rapid growth in the educational features of dairying in our State and the large patronage of our dairy school make it necessary to complete every possible room in connection with our dairy building, and make some additional extensions. Instead of one term a year in dairying, as hitherto, we have had to arrange three terms. We have had to make lockers for the proper placing of the apparatus for the respective students which necessitates the finishing of a new room for the placing of these. We must also have a lecture room in the dairy building in order to have dairy apparatus and machinery in immediate touch with the class. It would be a serious disadvantage to be compelled to take the dairy apparatus away from the creamery building. The cheese curing department needs still additional improvements and furnishings in order to properly regulate the moisture and temperature, so vital to the proper curing of cheeses through the various seasons. The dairy work room has not proved large enough. The rooms now used for cooling room and ice house should be thrown into the main work room and the cold storage room extended to the east end of dairy building.

Those and other urgent needs of the creamery building would require an additional appropriation of $3,000.

GENERAL REPAIRS AND IMPROVEMENTS.

With the vast amount of property owned by the State in an institution like this there are always numerous repairs and improvements, and when appropriations in the past have not been as liberal as they should have been, the necessity for such repairs and improvements greatly increase. Of such repairs we have included a number of specific things, among which is a water heating system for the office building. The last legislature made vast improvements in this building, which is used the most constantly of any building on the grounds. The heating of such a building by coal stoves is undesirable and uneconomical, and an appropriation of $1,000 for putting in a water heating system would place this building in first-class condition,

2. The remodeling of College hospital is now imperative. As it is, we have no room for convalescents, and in cases of very serious illness the patients are not properly isolated from the others. The veterinary department is now moved out of the first story of the building into agricultural hall, and additional hospital facilities, including a hospital kitchen, can now be provided. It has been in contemplation to overhaul this building, and an estimate of it would be about $700.

3. The remodeling of the basement of the chemical laboratory was extended as far as the funds would allow. For its completion an additional $150 would be required.

4. The basements which have been used in connection with the physical laboratory are also much in demand and their refitting is estimated at $400.

5. With the addition of our new buildings and the long use of our steam heating plant there is still much to be done in its extension and repair. The cottages for young men are heated by wood stoves which are both expensive and unsafe where you have so many different persons together. We can extend the heating plant to these rooms with far less cost to all concerned, with better temperature and health for students. This will cost $4,000.

6. The barns about the place still need additional repairs and improvements. The fences should be greatly bettered on parts of the farm. For both of these purposes there should be an appropriation of $500.

7. There must be fitted up in agricultural hall a laboratory for the departments of agriculture and chemistry and for chemical and veterinary sections of the experiment station. The moving of the department of agricultural chemistry into the new agricultural hall will make it necessary for more ample provisions in this department than we have had hitherto. The rooms need to be fitted especially for

work of this character. The chemical and veterinary sections of the experiment station have not had proper facilities for their experimentation largely for lack of suitable rooms. In the new agricultural hall rooms have been set apart for these sections and considerable arranging and fitting of these rooms will be required in order to give them suitable advantages. For all of the purposes there will be needed $3,000.

8. Repairing and improving of other college buildings will be required. The cottages are sadly in need of repairing and improving. North hall also needs much attention. Engineering hall has been slighted for several years, and must have enlargement. The physical and chemical laboratory building will require repair, and the roof of Morrill hall and some of the rooms not included in last year's finishing will necessitate further outlay. A permanent glass front aquarium for supplying laboratory material in zoology is in demand. A number of the houses for professors are rapidly depreciating in value for lack of funds. Many minor repairs and improvements must be made in the other college buildings. For all this work there will be needed $5,000.

This general item of repairs and improvements is a most important one, which cannot be slighted without injury to the work of the college.

GREENHOUSE FOR HORTICULTURAL DEPARTMENT.

Our horticultural department has long been in need of a greenhouse of sufficient capacity for its present work. Two years ago this matter was deferred on account of the creamery, and Prof. Budd kindly consented to shift as best he could until the present, but with the important work of horticulture in the State and the prominence to which it has been carried in our College make it high time for action in this direction. A greenhouse of proper dimensions and arrangements is estimated at $5,000.

MAGNETIC OBSERVATORY.

Laboratory work in magnetism can only be satisfactorily done in a building free from iron and at a distance from all dynamos and machinery. Work with magnetic instruments to be of value must be so located as not to be affected by surrounding objects. A magnetic observatory should be located at a distance from all other college buildings, well removed from dynamo rooms and built of wood. Copper nails and brass bolts should be employed in its construction, and a copper stove for heating. This would cost $1,000.

EXPERIMENT BARN.

We are doing a vast amount of experimental work in connection with the farm department. Much of this work is original and designed to lead thought in agricultural pursuits. Our present barns are quite old and ill adapted to much of the experiment work. We should have a barn with modern improvements, thoroughly lighted and ventilated, and protected, so as to give the best advantages for all forms of experimental feeding, breeding and growing of farm animals. For this there should be an appropriation of $5,000.

CARPENTER AND MANUAL TRAINING SHOP.

Our present building for shop work in carpentry and manual training is quite deficient and inefficient. It is an antiquated wooden building, poorly lighted, too small for our classes, and so constructed that we cannot heat it comfortably in cold weather. It is not capable of making a good stable, let alone being a building for the education of young men in the important skill and industry of the hand in the preparation and uses of wood. This building, at the lowest estimate, would cost $8,000.

MACHINE SHOP.

Our present machine shop in engineering hall is also in too narrow quarters. The shafting and machinery interfere seriously with the drawing rooms above. The drawing rooms themselves are not of sufficient capacity to accommodate our classes. Both the mechanical and engineering departments need more space for additional class and drawing rooms. The present machine shop could thus be utilized at once for this pressing need of the engineering departments. A new machine shop of ample dimensions would cost $8,000.

ANNEX TO PHYSICIAL LABORATORY.

For lack of funds we have been compelled to accommodate the department of chemistry and physics in the same building and may be compelled to do so for quite a time to come. We need an annex building to be used for oxygen and hydrogen generators and storage reservoirs, blast and vacuum pumps, with blast reservoir and vacuum chamber and storage battery. These should be in an isolated building on account of the danger of serious explosions in the generation of oxygen and hydrogen, on account of the noxious fumes given off by storage batteries, and of the importance of removing the pumping apparatus and motor to a distance from the delicate apparatus of the laboratories. This building would be equally useful to the chemical

and physical departments and would be similar in design to the "Copper House" or magnetic observatory mentioned, and constructed in the ordinary way, at an estimated cost of $1,000.

ASTRONOMICAL OBSERVATORY.

In an institution of the scientific standing of our College the facilities for teaching astronomy should be much more ample. In practical astronomy efficient teaching requires actual instrumental work to make it intelligible and valuable. For $3,500 the erection of an astronomical observatory for students' use could be accomplished to marked advantage.

ARMORY.

Much of our work in military tactics and gymnastics is prevented and hampered for lack of a suitable place in which to drill. Military tactics is a most desirable and important part of our college work. Such training adds to the carriage, health, discipline and character of our students. The favorable notice received by our cadets at the World's Fair bears striking evidence of the efficiency of this work in our institution and the reasonableness of giving the help and encouragement of an armory. A number of other states have provided for institutions of like character good armories. The estimated cost is $15,000.

BUILDING FOR VETERINARY DEPARTMENT TO CONTAIN OPERATING AND DISSECTING ROOM.

In the treatment of some of the modern infectious diseases of animals it becomes necessary to have these patients entirely separated from infectious contact with the others. A number of these cases are commanding the attention of the department at Washington and of the veterinary departments in this and other states. Such investigations to be valuable must be painstaking, and thorough. Our present hospital facilities are already employed in other directions and moreover it would not be safe to have this class of patients in the same building with other animals. Our present dissecting room is outgrown and in this building there would be provided a room suitable in dimensions and conveniences for dissecting purposes. The building would cost $5,000.

GENERAL SUMMARY.

After a comparative examination of all the departments of the college the board of trustees agreed without any dissent, to ask the following appropriations of the Twenty-fifth General Assembly of Iowa. There are other pressing needs not mentioned in this list, but they felt the necessity of compressing their present askings as much as possible:

LIST OF APPROPRIATIONS ASKED OF THE TWENTY-FIFTH GENERAL ASSEMBLY.

1.	Water supply		$ 21,500.00
2.	Ladies' hall		75,000.00
3.	Electric light plant		8,000.00
4.	Repairs on main building		4,000.00
5.	Forge shop and foundry		9,000.00
6.	Completion and improvement of the creamery building		3,000.00
7.	General repairs and improvements—		
	Water heating system for office building	$1,000.00	
	Remodeling college hospital	700.00	
	Remodeling basement of chemical laboratory	150.00	
	Remodeling basement of physical laboratory	400.00	
	Extension and repair of steam heating plant	4,000.00	
	Improvement of barns and fencing	500.00	
	Fitting up laboratory in Agricultural Hall for department of agricultural chemistry and for chemical and veterinary sections of the experiment station	3,000.00	
	Repair and improvement of other college buildings	5,000.00—	14,750.00
8.	Green house for horticultural department		5,000.00
9.	Magnetic observatory		1,000.00
10.	Experiment barn		5,000.00
11.	Carpenter and manual training shop		8,000.00
12.	Machine shop		8,000.00
13.	Annex to physical laboratory		1,000.00
14.	Astronomical observatory		3,500.00
15.	Armory		15,000.00
16.	Building for veterinary department to contain operating and dissecting rooms		5,000.00
	Total		$186,750.00

The reasons given to the Twenty-fourth General Assembly why appropriations should be granted then are truer still for the Twenty-fifth General Assembly. With slight changes they are restated with the added emphasis of a repetition:

1. They are all very much needed. We are asking simply for our legitimate needs and what we must have in order to allow our work its proper growth.

2. The nation has provided generously in behalf of the college, thereby putting the State under urgent obligations to carry out her part of the contract by providing ample buildings and suitable facilities for the successful prosecution of the work.

3. The Iowa State Agricultural College has made excellent use of what has already been entrusted to its care. It shows much careful husbanding of the funds and appropriations already bestowed upon it. It is the highest wisdom of the State to give freely to an institution that makes judicious use of what has already been given it.

4. As an institution we have no war to make against the appropriations of any other institution in the State. The State should provide liberally for the maintenance and growth of all the institutions under her care.

5. Gen. Garfield's proverbial statement, "Education is the chief defense of nations," means that education is the chief defense of states and of Iowa.

6. Every live institution must make provisions for its immediate growth. The demands for enlarging the scope of our work at present are only those that the State can supply. We need more buildings and greater capacity for the utilization of the funds given us by the nation.

CONCLUSION.

I submit herewith special reports from each department of the college. In these will be found important information as to the condition and progress of work in their respective directions. I bespeak for them all a careful and broad consideration. I count it a high privilege to express my highest gratitude and appreciation as to the intelligent co-operation and help of all the professors, teaching assistants, office assistants, to the students, citizens of Ames and vicinity, to the alumni, patrons and friends of the Iowa State Agricultural College throughout the State and country. Allow expressions of high and hearty estimate of the earnest direction and liberal support of the board of trustees as to the work of the College, and of the chairman in particular. Robert Burns, in that inimitable poem on an honest poverty, concludes:

> "Then let us pray that come it may—
> For soon it will for a' that—
> That sense and worth, o'er a' the earth,
> May bear the gree, (good will) and a' that."

So, may the "sense," and "worth," and "a' that" of the incoming legislature "bear the gree" that is made current over the world's counter by liberal appropriations to the Iowa State Agricultural College.

Very respectfully,

WM. M. BEARDSHEAR,
President.

VETERINARY SCIENCE.

M. STALKER, PROFESSOR.

There are few changes to note in the course of study since the biennial report of 1891. Since that date the college has had a period of general prosperity, in which the department has shared. I have in previous reports called attention to the objects and purposes of this section of the college, viz.: To give to young men a thorough training for the practical work of the veterinarian, as well as to fit them for the more difficult tasks of the original investigator and teacher. I believe the department has reason to congratulate itself on a fair share of success in its undertakings.

The department has acquired some very important helps for the furthering of its work since the last biennial report. The Twenty-fourth General Assembly appropriated the sum of $35,000 to be expended in the erection of a building for the accommodation of the three departments, veterinary science, agriculture and horticulture. The department is just occupying its new quarters in this building. Its share in the completed portion of the new building includes two offices, two lecture rooms and a private laboratory. When the building is completed, there will be added a large laboratory for histological, pathological and physiological work, and ample museum accommodations. It is altogether desirable these portions of the building should be completed as early as possible, as important work of the department is seriously interfered with by the lack of these facilities. When the building is completed the department will be equipped with office, lecture room, laboratory and museum facilities that are first class in every particular and adequate for many years to come.

I have previously called attention to the urgent need for better dissecting room facilities. I have presented plans and specifications for a building at moderate cost. I would renew my request that this building should be provided as soon as possible, as it is the one additional facility the department most stands in need of. If the two items I have mentioned can be secured, it is my belief the department will not have to ask the State for an additional appropriation for a number of years.

HORTICULTURE AND FORESTRY.

J. L. BUDD, PROFESSOR.

CLASS ROOM WORK.

Instruction in horticulture and forestry in class room and field is now confined to the students in the agricultural course. In 1892, the number enrolled in the several clases were: Freshmen, 28; Sophomore, 10; Junior, 11; Senior, 13. In 1893, Freshman, 27; Sophomore, 25; Junior, 8; Senior, 9.

The increased number in junior and senior classes in 1892, was the result of lapping over of students in the general course at the time of establishing the distinctive course of agriculture.

On the other hand the increase in numbers of freshmen and sophomore classes show the growth of the agricultural course in number of students. In all the classes instruction is now imparted by lectures and object lessons in class room, work room and field. Careful note taking is required, the note books being subject to inspection and marking at the close of the term. The lecture system with frequent reviews we have found most instructive and interesting to the classes, especially at this time when we have no suitable class books in horticulture and forestry applicable to the prairie states.

Each year adds to the number of our graduates and special students who are doing creditable work as professors of horticulture, horticulturists at the experiment stations, officers of horticultural and forestry associations, writers for the press, or local leaders in orcharding and gardening.

HORTICULTURAL EXPERIMENTS.

Our work in the way of introduction and dissemination of new and valuable fruits, shrubs, ornamental trees, etc., is now well known across the continent. Its details are given in press reports and in the bulletins of the department and the experiment station. We are also pleased to report that we are doing much valuable work in hybridizing and crossing fruits and shrubs that promises valuable results in the near future. These varied lines of work give a fine opportunity for demonstrating the old adage that "people rust out sooner than they wear out."

DEPARTMENT NEEDS.

We are now happy to report that the new Agricultural hall furnishes ample room for class work, offices, library, seed rooms, cellar storage, etc., for the first time in the history of the department. We feel duly thankful for these aids but the need of a plant house and suitable propagating appendages is still apparent

The fine picture of the new Agricultural hall shows a greenhouse attached. It is in the original plan submitted to the legislature by the architect. But the need of cutting down the appropriations in the Columbian year left out this vitally important attachment. So far as I know every agricultural college of our country has a greenhouse if nothing else in the horticultural line. Permit me to hope that the coming legislature will make an appropriation for this use of not less than $5,000. If made of iron and glass with slate bottom for benches, needed propagating attachments and hot water heating, no less sum will cover the cost.

DEPARTMENT OF MATHEMATICS AND POLITICAL ECONOMY.

E. W. STANTON, PROFESSOR.

This department has shared during the last biennial period the prosperity which the college as a whole has enjoyed. The increased attendance of the first year filled the classes to overflowing and necessitated the establishment of additional divisions in algebra, geometry, trigonometry and analytics. Even then as high as seventy-seven students were enrolled in a single division, rendering still further sub-dividing necessary on review and examination days. Six hours per day of my own time, and five hours of my assistant's, were on the average given to the recitation room. Planning the class work so as to handle it to the best advantage, preparing recitation outlines, marking examination papers and attending to other detail requirements of the department, absorbed considerable additional time and energy. Though the students heartily co-operated in overcoming the difficulties incident to large classes, and though on the whole the quality of the work done was equal to the average of previous years, nevertheless, it was evident that additional teaching force was needed to properly meet the increasing demands upon the department. The board of trustees, at their annual meeting in December, 1892, relieved the department of giving instruction in commercial law and arranged for the employment of a second assistant, who in addition to teaching should assist in the work of the secretary's office. The plan has proved an admirable one. Miss Julia Wentch, a graduate of the college in the class of 1888, and, at the time of her appointment, instructor of mathematics in the high school of Beatrice, Neb., was chosen as this second assistant and has by faithful and efficient service proven the wisdom of her appointment. She has had charge of algebra in the preparatory and agricultural courses and of one division in the course in science. The remainder of the work of instruction in the department has been divided between the first assistant, Miss Roberts, and myself. It is due that earnest, capable instructor to say that her teaching has been in every way satisfactory. Competent, conscientious, enthusiastic, she does well an amount of work which only few are capable of carrying.

The scope and general character of the instruction given in the department are much the same as set forth in the last biennial report. The interest hitherto shown in mathematical studies has been fully sustained. It is the aim of the department to inspire in the student a wholesome discontent with inferior work, and to enforce such requirements as can be met only by the diligent, painstaking, masterful student. While a few have failed to meet these requirements, the great majority have completed their studies in this line with credit, and many with high honor.

The introduction of Well's College Algebra has been, on the whole, an improvement, especially in the advanced courses. Osborne's Calculus has proven a text of great value since it has enabled the class to obtain that knowledge of this method of mathematical investigation which is best fitted for practical use.

In political ecomomy the most marked change during the biennial period has been the enlargement of the work in the engineering courses. Formerly engineering students could pursue this subject only three hours per week during the second term of the junior year. It is now made a full term study, the requirements being the same as in the other courses. The class this last fall numbered forty-seven. Another year it will probably be necessary to divide the class into two divisions. The advanced work of the first term senior year has shown a healthy growth. Starting originally with an enrollment of two, the class numbered in 1892 seven, in 1893 eleven, and the applications for admission to the class in 1894 already exceed fifteen. The work of this term is to take up the successive economic schools, examine their doctrines with reference to existing economic conditions, trace their gradual modification and displacement by other systems, and thus, through a study of the growth of economic thought, reach a clearer understanding and better judgment of the economic theories and practical industrial problems of the present time.

The following table shows the class work done in the department during the two years:

Taught by myself:

CLASSES.	Recitations per week	No. of students, 1892	No. of students, 1893
First Term—			
Calculus	5	35	17
Calculus, first half term	5	...	24
Calculus, second half term	....	....	12
Plane Trigonometry, ten weeks	5	61	46
Spherical Trigonometry, seven weeks	5	32	31
Algebra	5	64	47
Algebra	5	59	....
Political Economy, Senior	5	7	11
Commercial Law	2	54	....
Extra review and examination divisions 1892, equivalent to	5	....	....
Second Term—			
Analytics	5	29	26
Analytics	5	21	23
Geometry	5	69	40
Algebra, Advanced	3	77	....
Political Economy	5	49	47
Extra review and examination divisions, equivalent to	5	....	....

Taught by Miss Roberts:

CLASSES.	Recitations per week	No. of students, 1892	No. of students, 1893
First Term—			
Calculus, second half term	5	....	12
Algebra	5	40	40
Algebra	5	32	....
Plane Trigonometry, ten weeks	5	34	38
Plane Trigonometry, ten weeks	5	....	39
Spherical Trigonometry, seven weeks	5	....	31
Geometry	5	....	12
Extra examination divisions and drill classes, equivalent to	5	....	....
Second Term—			
Analytics	5	14	20
Geometry	5	54	25
Geometry	5	33	40
Algebra, Advanced	3	....	30
Algebra, Advanced	2	....	50
Algebra	3	36	....
Algebra, Preparatory	5	44	....
Extra examination divisions and drill classes, equivalent to	5	....	....

Taught by Miss Wentch:

CLASSES.	Recitations per week	No. of students, 1893
First Term—		
Algebra	5	26
Algebra	5	25
Drill classes, equivalent to	2	....
Second Term—		
Algebra	3	35
Algebra	5	40

Miss Wentch devotes the greater part of her time to office work, remaining at college a considerable portion of the winter vacation.

MILITARY SCIENCE AND TACTICS.

J. R. LINCOLN, PROFESSOR.

I have the honor to report the work in the department of military science and tactics as successful as could be expected, with the limited time for instruction and the necessity of missing drills when the weather was such as to prohibit outdoor exercise.

The most pressing need of the military department is an armory, not only for drill purposes, but in order to have a place for the care and preservation of the property of the State held by the college.

The visit of the cadet corps to the Columbian Exposition, and the favorable attention they commanded there, are evidences that the College has cause to feel that in the cadet corps it has a body of students who creditably represent our institution by their dignified bearing, cheerful discipline, healthful appearance and excellence of drill.

I fully appreciate the assistance I have received from so many of the officers and trustees of the College in my work, and sincerely trust that they deem it best for the interest of our College, as well as the military department, that an armory should be erected for military purposes; $15,000 will build and complete an armory such as is needed and one that will be an ornament to the college campus.

GENERAL AND APPLIED CHEMISTRY.

A. A. BENNETT, PROFESSOR.

The biennial period just closed has been a prosperous one for the college and for its chemical departments. There has been but few changes in the course of study pursued and in the general policy and methods of instruction of the department. Experience in all the great schools and colleges of industrial instruction has shown that the only basis of a study of applied science is found in a thorough understanding of the fundamental principles on which these sciences rest. It has been the aim of this department to conform its methods of instruction to this experience. Further, the laboratory method of instruction is thoroughly believed in and is conscientiously applied at all stages of the student's progress. The basal idea of true laboratory study lies in the discovery of scientific truth (new to the student) and not in the mere confirmation of what has been learned by rote from a text book or what has been shown to him in some previous lecture by the instructor.

In this department laboratory study precedes the recitation room work, and the attempt is made to develop thought in connection with the study, in addition to the accumulation of knowledge of facts belonging to the science of chemistry.

Later in the course of study, the student applies this knowledge to many of the practical chemical problems. Among the questions studied are those of methods of analysis, examination of manufactured products for impurities and adulterations, analysis of natural substances such as coal, ores, water, animal and vegetable substances, the preparation of organic and inorganic substances of commercial importance, and, in general work is carried on along most other lines of applied chemistry.

A course in mining engineering has been established during this biennial period, and naturally much of the technical work of such a course belongs to this department. A course of study has been prepared that includes, in addition to the preliminary study, work in blow pipe analysis, metallurgy and assaying, occupying nearly two years of time. It is intended to make this work helpful to the practical assayer and mining engineer from the chemical standpoint.

DEPARTMENT NEEDS.

The department needs more room and that changes be made in the present equipment, so that more students can be accommodated in the room now supplied. During the year just passed the laboratory has been much over-crowded. Eighty tables have been used for about one hundred and twenty students.

Iron pipes will rust out in course of time, especially is this true of such pipes

when they are used to convey fluids from chemical laboratory sinks. The whole system for the removal of water from the sinks must be replaced.

These and other needs have been more carefully explained in my annual report to board of trustees.

EQUIPMENT.

The laboratory is well supplied with apparatus and chemicals. The equipment includes apparatus for gas analysis, fifteen balances for delicate weighing and many special forms of apparatus. The working tables are supplied with gas, water and reagents. In a word, the equipment is equal to that furnished by the best colleges of the country.

ZOOLOGY, ENTOMOLOGY AND GEOLOGY.

HERBERT OSBORNE, PROFESSOR.

During the past two years the classes in this department have been much larger than heretofore, and have very fully occupied the time of instructors as well as space provided for work.

The studies remain as outlined in previous reports and the general plan of instruction is the same.

Work with the general students and students in the agricultural course in this department begins in the fall term of the freshman year, when a course of lectures and class exercises with field studies in economic entomology is given. This is intended not only to acquaint the student with the more important injurious insects and the methods of treating them, but also to give him an elementary knowledge of insect structure, metamorphosis, and the methods of observing and studying animal life. Zoology begins in the fall term of the sophomore year, with laboratory studies of typical forms of animal life, and deals mainly with morphology. Class work embraces recitation from text-book, occasional lectures, and quiz on laboratory work. This term is preparatory to, and is followed by a full term's work in spring of junior year on a study of the different groups of the animal kingdom. Laboratory and class work are associated, and the student acquires familiarity with the animals of different groups by actual study with microscope, or by dissection. Special attention is given to origin and affinities of domestic animals.

In the fall term of the junior year students prepared for the work may elect a full term's work in entomology, embracing a systematic study of insects, and furnishing also additional drill in methods of study in gross and minute anatomy and a further knowledge of the life history and habits of injurious species. Advanced or special work may be elected in the senior year, which may consist of vertebrate dissection or elements of embryology, and special studies on selected forms or groups with preparation of thesis. Candidates for the second degree may continue such work with opportunities to pursue original investigations.

Geology is taught to the seniors in the spring term, and embraces a study of the principles as presented in LeConte's Elements, the preparation of rock sections, essays on economic geology, geological maps, a study of typical fossils and a review of the geology of Iowa. Mineralogy and Patrography have been added as part of the mining engineering course, as also a term's work in economic geology, the latter being open to election by students in science and ladies' courses.

Students in the veterinary course are given two exercises per week, second term

of first year, and three exercises per week in the first term of the second year in zoology, and two exercises per week, second term of second year, on animal parasites.

EQUIPMENT.

The laboratory is supplied with about thirty microscopes, various microtomes, including a Thoma, and other apparatus for microscopical work and gross dissections. A supply of marine animals, properly preserved for laboratory work furnishes means for study of forms otherwise inaccessible to inland students.

The room containing the general zoological collection occupies the upper or third floor, and is a large room with high ceiling, and with windows so arranged as to give an equal distribution of light. The second floor contains a large room for geology and mineralogy, another for a collection of Iowa animals, and a third which is occupied by a collection of casts of fossils. The first floor contains the lecture room, laboratories and insect room, while the basement is devoted to rooms for insect rearing, taxidermy, osteology, alcoholic collections and preservative materials.

The collections have been considerably increased during the past two years. The principal additions have been a collection of Mexican animals, the result of my trip to southern Mexico during the winter of 1891-92. This contains about eighty birds, a number of reptiles, batrachians and fishes, several thousand insects, and a number of crustaceans and shells and other marine material.

A collection of marine animals secured by the university Bahama expedition, on which we employed a collector, Mr. H. F. Wickham. This contains also a number of insects from the Florida Keys and Bahama Islands. The collection is especially rich in corals, echinoderms, and contains also much material for laboratory use. A collection of minerals has been deposited by Mr. H. F. Bain, and Mr. John Pettee has donated a very fine, large specimen of silicified wood, a stump nearly three feet long and eighteen or twenty inches in diameter, from Wyoming. Many specimens have also been added from our own collecting and donated by students.

A number of southern batrachians and reptiles and a collection of eggs of Iowa birds have been added by purchase.

As the collection now stands they form a most useful equipment for the study of all branches of the animal kingdom and all departments of geology and mineralogy. Every important group of animals is represented, and in many cases by full and perfect series. For instance, in the echinoderms we have a number of species of living crinoids, among them the stalked crinoid, *pentacrinus caput medusa*, while the other classes are fully as well represented.

The insect collections have been much enlarged and some of the material rearranged in shape for most ready reference.

The correspondence of the department has, as usual, occupied much time, and while this work does not show in any evident manner I consider it one of the most important, and a labor that could not properly be curtailed in any way. It should in fact, be considered favorable that the people of the State are disposed to avail themselves of the opportunity to obtain information as to birds, insects and other animals they meet with. Our collection enables us to identify almost any animal found in the State, and especially in the birds and insects they are very complete. We believe that the more these can be used by the people of the State the better.

I have also prepared many articles and replies to inquiries about insects for various agricultural and State papers, and for various societies where it seemed proper to present results of work accomplished here.

In conclusion, it seems proper to say that the past two years have been marked by healthy growth and that the department is in better shape than ever before. This I feel is largely due to the constant encouragement and generous support it has received from the president and board of trustees.

HISTORY AND ENGLISH LITERATURE.

A. C. BARROWS, PROFESSOR.

During the years 1892 and 1893, the instruction in history and English literature has been practically the same with a difference only in details. I conducted four courses in history, as follows:

1. Preparatory course in American history. Five recitations a week, last half of fall term. This course was taken by thirty-six students in 1892, and by twenty-eight in 1893.

2. General history. Open to freshman in the agricultural, science and engineering courses, and to sophomores in the ladies' course. This course was taken by ninety-seven freshmen, reciting five times each week, first term, and by twenty sophomores, reciting twice a week both terms in 1892. In 1893, it was taken by forty-five freshmen, reciting three times each week, first term, and twice a week second term, and by fifteen sophomores, reciting twice a week both terms. This course included the history of Rome from its foundation down to the irruption of the barbarians; then the history of England to the reign of George III. Special care was taken to bring out the laws of historic cause and effect and constant watch was kept for the appearance and development in England of these principles and customs on which American civilization is founded. The method adopted combined the study of a full text book with talks and lectures by the instructor, and the investigation of more important topics by individuals.

3. A course in the history of the development of the United States; three hours each week the first term, open to seniors of agricultural, science and ladies' courses. The class consisted of thirteen students in 1892, and of twenty-one students in 1893. It first investigated the origin of our civil institutions, then studied topically our territorial expansion, the admission of the states, political parties, elections, tariff legislation, coinage, internal commerce, manufactures, agriculture, biographies of presidents, foreign relations, education, churches, periodical literature, congress, the supreme court, reform, slavery, secession, reconstruction and Indian wars.

4. A course in the history of civilization. Five exercises each week, second term, open to seniors in the courses in agriculture, in science and for ladies. This course was taken by twenty-five pupils in 1892 and by twenty-three in 1893. It included an investigation and estimate of the institutions of Egypt, Mesopotamia, of the Hebrews, Greeks and Romans, the rise of Christianity, feudalism and chivalry; the renaissance and reformation, and some modern reforms and discoveries. I delivered formal and informal lectures and furnished full outlines with references for study of the various topics included in the course.

LITERATURE.

1. A course in American literature, three exercises each week, first term, open to juniors of the courses in agriculture, in science and the course for ladies. This course was taken by forty-three pupils in 1892 and by thirty-five in 1893. I delivered lectures on the intellectual development of the United States. The pupils worked up in the library sketches of the lives and writings of the most important authors in accordance with prescribed outlines, and selected writings were critically studied in the class.

2. A course in English literature from Chaucer to the present century. This course was taken in 1892 by twenty-six, and in 1893 by thirty-six students. It was open to the same students as Course 1, and the methods of study were nearly the same, except that more time was given to direct study of masterpieces and less biography. There were five exercises each week of the second term.

Including only those hours when I was actually instructing classes in the class room, my hours of teaching have been:

In 1892, spring term, 21 hours each week.
In 1892, fall term, 21 hours each week.
In 1893, spring term, 23 hours each week.
In 1893, fall term, 23 hours each week.

BOTANY.

L. H. PAMMEL, PROFESSOR.

Owing to the increase in the number of students we have at all times needed more room to do our work properly. Owing to the large increase in students much time has been devoted to class room work and in this we have been assisted in 1892 by Miss Mary A. Nichols, now instructor in chemistry and botany, in East Des Moines High school, and in 1893 Mr. F. C. Stewart performed these labors as well as being station assistant.

The work of the department for the two years may be arranged as follows:

SUMMARY OF STUDENTS, 1892-1893.

	1892	1893
Elementary Botany	96	92
Vegetable Physiology	52	66
Structure of Woods	11	12
Cryptogamic Botany	24	42
Microscopical Examination of Foods	18	12
Bacteriology	29	38
Pharmaceutical Botany	11	14
Bacteriology, advanced	..	17
Bacteriology of Milk	1	5
Bacteriology, dairy students	28	44
Decay of Timber	10	5
Seeds and Grasses	9	9
Vegetable Pathology	11	17
Special	..	5
Post Graduate	..	5

By classes these students may be arranged as follows:

	1892	1893
Freshmen	96	92
Sophomore	87	122
Junior	58	64
Senior	31	53
Dairy	..	19
Special	..	5
Post Graduate	..	5

In addition to the work in instruction attention should be called to writing for the agricultural press of this and other states. During the year a large number of queries from agricultural papers are received with requests that these queries be answered through their papers. This is done cheerfully as the College thus exerts a wider influence. I also receive many queries and specimens from private individuals which are answered. Occasionally these inquiries require some time in looking up, but it is time well spent. This correspondence is increasing every year.

In order to stimulate students to do good work I have adopted the plan of publishing the results of their work when worthy of the same. The following papers have been published: Prof. P. H. Rolfs, of the Florida Agricultural College, "Seed Coats of Malvaceae;" Dr. H. Whitbeck, "Microbes of Pus;" Prof. S. A. Beach, of New York State Agricultural Experiment Station, "Some Bean Diseases;" Miss Mary A. Nichols, East Des Moines High School, "Achemical Hairs of Compositae;" Joseph Chamberlain, "A Comparative Study of the Styles of Compositae."

Owing to the limited funds of the College the department has not been able to extend its collections very materially, and this is a serious hindrance to work. We have enlarged our collections by purchasing Prof. Hitchcock's herbarium of Iowa plants, made largely while a student at this College. I have also turned over my own herbarium, amounting to 5,000 specimens, to the College, believing it is of more service to the College than it is to myself. We have received a fine set of specimens from Mr. Fred Reppert, of Muscatine, and also a collection from the United States Department of Agriculture. We have added several sets of fungi, but we have not sufficient funds to buy all we should have.

We have not been able to purchase much in the way of equipment and this occasions much inconvenience in our instruction. Most of our microscopes have been in use more than fifteen years and soon will have to be replaced by better instruments. We should have more apparatus for doing physiological work, as this is important in a technical school, but this kind of apparatus is expensive and hence we can only purchase the smaller and less expensive ones.

NEEDS OF THE DEPARTMENT.

Our herbarium is a most valuable one, containing as it does 2,500 specimens, many of which cannot be duplicated, especially certain sets of fungi, algae, and sets of North American flowering plants. It seems to me that they should be placed out of danger. It is needless to say that should a fire start in the building that everything would be consumed in a short time, and the labor and money invested in the collection would be lost. The herbarium is valued at about $3,000; besides, the microscopes, books and apparatus does not fall short of $3,000 more as a conservative estimate. Shall it be subject to this danger or be preserved?

I should like to urge the important need of better quarters for the department. The department, I believe, has been increasing its usefulness, and to put students in the quarters we now have should not be asked.

DOMESTIC ECONOMY.

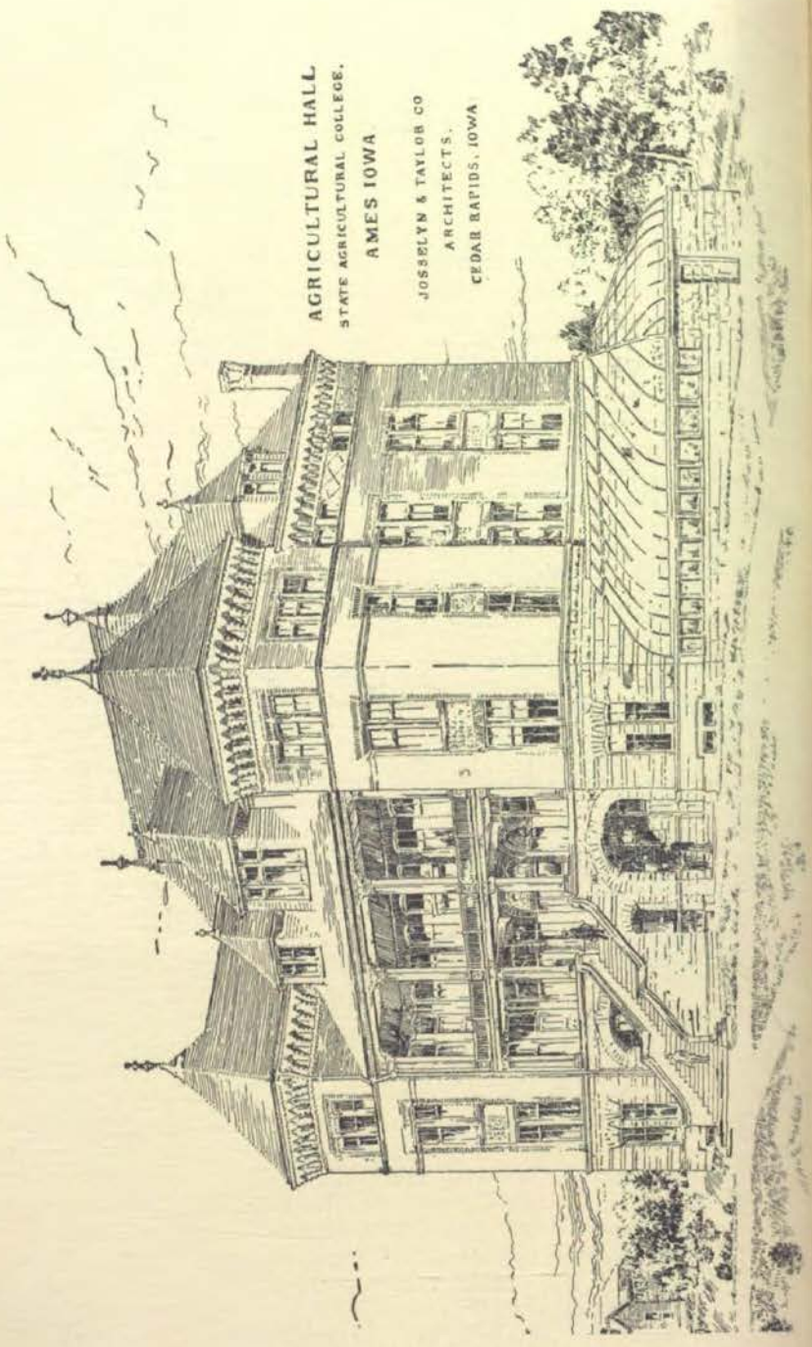
MRS. E. OWENS, DIRECTOR.

The work in this department is undertaken by most of the young women entering the College. The course consists of the study of the composition of foods and their correct combinations, the adaptation of food to the age, climate, occupation and means. Also household sanitation and general hygiene. Text books and lectures are both used in imparting instruction along these lines. Different culinary processes are taught in the cooking classes, which continue throughout the College year, and the work in this direction is varied and extensive.

The importance of instruction in household science as a part of a college course in a co-educational institution becomes more apparent when we recognize the fact that young women who spend several years at college acquiring a scientific and literary education grow away from interest in matters pertaining to household management. Their minds, trained to exactness by their scientific studies, dwel. with growing distaste upon the inexact and experimental methods employed so generally in work of this nature. Experience, however, proves that a well constructed course in household science introduced into a college course pursued by young women, if conscientiously carried into practice, combined with well grounded scientific theories, entirely does away with this distaste and lack of interest in household matters. When the educated woman is brought to realize by these means that many of the principles acquired during the college course can and should be applied to home work—that interesting and well established scientific principles underlie all culinary processes, then the field of home labor ceases to be a barren waste, waiting to be made habitable by toil, without thought and reason.

The great need of this department is more commodious quarters for laboratory work. This work is now carried on in a kitchen, of moderate size for a private house, intended to accommodate maid and mistress. It is impossible to introduce into such contracted quarters, the modern appliances that should be found in a department of this kind. The great State of Iowa can well afford to furnish her daughters with the best facilities for carrying on the pursuits of this study at the State Agricultural College, more especially because it is the only college in the State where such instruction is given.

The most appropriate place for the department would be in a commodious and well constructed building used as a dormitory and boarding hall by the young women of the College. To have the department work connected with and carried on in such a house would in many ways facilitate and supplement the work of teaching housekeeping as an applied science, and this is the true way for women to learn this work and it is well proven that it is the only form in which the educated women of to-day will receive instruction in matters domestic.



THE FARM.

JAMES WILSON, PROFESSOR.

The farm, around which is grouped the station, that gets land and animals for experimentation, the creamery, that is closely connected by exchange of bye products for labor, and the garden that gets land to grow vegetables in exchange for its bye products and occasional help, has had a very fairly successful year. The crops have averaged well on all the well drained fields, the animals have all been healthy, yielding the usual increase from the several breeds. In accordance with the decision of the board of trustees we made a sale of the surplus stock, including some cross bred cows, young bulls of the several breeds belonging to the farm and station, young boars, and several of the last spring lambs of both sexes, and also some old machinery that was not suitable for our uses. We have, by weeding out, very much improved the College herds, and also brought the stock within the ability of the farm to sustain without depending on purchasing so much feed.

We must not consider the farm from the commercial standpoint altogether. The advanced position this College has taken as an educator of the young farmer requires the several breeds of domestic animals to be kept, to illustrate instruction, which makes extra expense, and the extensive system of experiments we have inaugurated requires that the fields, stock and opportunities of the farm be at the disposal of the experimental station, so that facts and indications for the benefit of the farmers of the State may be had. Education is the object in view; and as close economy as possible is observed in the prosecution of this leading object. The financial statement attached shows the condition of the farm in this respect. While we have been improving the stock, depressed markets prevent us from raising the price of the inventory. The farm does not need more fine animals of any kind; it is amply provided with everything necessary to illustrate applied science in this direction.

THE AGRICULTURAL COURSES.

The board of trustees in 1891 established a four years' course, a two years' course, and a winter dairy course of ten weeks in agriculture.

The four years' course has thirty registered freshmen, thirty registered sophomores; there are six juniors and four seniors, several of whom changed their courses from others longer established. The building up of a four years' college course in practical and scientific agriculture in the agricultural colleges of the country has not been uniformly successful. The instruction afforded has not met requirements, or the teaching force has been inadequate, or the distance between the young farmer's country education and the college course has been a gulf too

wide to cross. Our trustees wisely determined to take the boy from the country school and give him four years of instruction in addition to what he gets there. This avoids the village high school and academy, where students are usually prepared for college, but this must be done if the congressional grant is to mean college education to farmers' sons and daughters. States that keep the gulf fixed have few students, or no students, in their four years' course, and must content themselves with giving literary education, or instruction in mechanical engineering, to the graduates of high schools from the towns and villages, which their reports already show is the major part of their work. The Iowa boy from the district school is probably much better prepared for college instruction than students are from district schools in most states. Our country schools are well taught by a well trained body of teachers who have themselves enjoyed the advantages of instruction in normal school or college. The following is the four years' course of instruction printed to show how it is arranged to succeed a district school training such as we have in Iowa:

FRESHMAN YEAR.

First Term.	*Second Term.*
Algebra—5.	Botany, Drawing and Economic Entomology—5.
Elocution—1.	Horticulture—3.
English Language—5.	Algebra—3.
History—5.	Live Stock—2.
or Bookkeeping.	Military Drill—2.
Live Stock—2.	Rhetoric—3.
Military Drill—2.	Library Work—1.
Shop Work—4 hours.	

SOPHOMORE YEAR.

Botany, Vegetable Physiology—4.	Botany, Cryptogramatic—3.
Horticulture—2.	Laboratory Practice—1.
Military Drill—2.	Chemistry—5.
Physics, Mechanics and Heat—5.	Laboratory Practice—3.
Practical Agriculture—5.	Military Drill—2.
Geometry—5.	Practical Agriculture—5.
Field Practice—1.	Zoology—3.
	Laboratory Practice—1.

JUNIOR YEAR.

Trigonometry and Surveying—5.	Botany Applied—1.
Botany, Bacteriology—1.	Laboratory Practice—1.
Laboratory Practice—1.	Chemistry, Agricultural—2.
Chemistry, Quantitative or	Laboratory Practice—3.
Qualitative—2.	Dairying—3.
Laboratory Practice—3.	Economic Science—5.
Elocution—1.	Entomology—5.
Heredity, Principles of—2 (elective).	Horticulture—5.
Law, Commercial—2.	Literature, English—5.
Literature, American—3.	Military Science and Drill—1 (optional).
Military Science and Drill (optional).	Agricultural Physics—3.
Agricultural Physics—3.	One Oration (required).
Zoology—3.	
Laboratory Practice—2.	

SENIOR YEAR.

First Term.	*Second Term.*
Anatomy of Domestic Animals—5.	Animal and Vegetable Nutrition—5.
Chemistry, Agricultural—2.	Dairying—5.
Laboratory Practice—3.	History of Civilization—5.
Dairying—3.	Horticulture—3.
Farm Drainage—2	Veterinary Medicine—5.
Geology—5 (elective).	Thesis (required.)
History, Development of U. S.—3.	
Psychology—5 (elective).	
Seeds and Grasses—2.	

The two years' course in agriculture is an abbreviation of the four years' course without mathematics and including dairying, with botany and agricultural chemistry, farm dairying, entomology, and anatomy of domestic animals.

The ten-week winter dairy school has been well attended. Our capacity is equal to the instruction of sixty students at one time. Ten weeks is not long enough to give thorough instruction in practical dairying, but is of great value to dairymen who study longer, or who, having previous experience in dairying, wish to study the sciences relating to dairying.

Two four-month courses have been added, corresponding to the two college terms, in which it is entirely practical to train first-class dairymen, as has been proved by the number of students who are now managing creameries throughout this and other states.

We have also a one-year course of eight months, corresponding to the two terms of the college year, where practical dairying, related sciences and experimentations make a very complete scholar in that line. Our college is sparing no effort to meet the demand for education in the dairy through an exceptionally well equipped working creamery that is in operation every week day of the year, through an agricultural chemist and bacteriologist, and through a specially educated professor in charge, who has the revenues of the college and station to assist in education and experimentation.

The design in future is to grow upon the farm and station grounds what crops are suited to our soil and climate under experimental conditions, feed them to the farm dairy cows, of which there are six different breeds, note the effect on milk giving, have the milk manufactured in the dairy and product saved, take it to the chemist for analysis, so that the dairymen of our State may get indications of the value of different plants.

There is more demand for dairymen from this State than we have been able to supply. Thirty-three students from our winter course are managing creameries, and report to us an average of $65.00 a month salary. Others are engaged in dairying on their own account, and some who did not complete their terms are helpers in creameries.

The citizens of Iowa have reason for congratulation on the success of the experimental and educational dairy.

THE DAIRY SCHOOL.

The report so far received from the students who attend the winter and spring dairy schools indicates that fifty per cent of them are in charge of creameries at an average of $65.00 per month. Fourteen of them are employed as assistants in creameries and cheese factories at an average salary of $35.00 per month. In addition to these, a number of these young men are interested in private dairying on their own account.

The attendance at the spring dairy school which was opened for the first time with the beginning of the present college year, was greater than could have been expected when it is remembered that it was not generally known that such a school was to be opened. Seventeen students were in attendance, and of this number it is known that thirteen are engaged in actual dairy work at good salaries, ranging from $40.00 to $75.00 per month. Some of these students had never before had experience in dairy work or instruction in dairy lines.

Nine students have been in attendance at the fall dairy school, which opened July 18th. Instruction can be given much more thoroughly at this summer school than during the winter, for several reasons: First, not so many students are in attendance as during the winter school, consequently they can be given more individual attention in the laboratory and have a better opportunity to become familiar with practical dairy work. Second, more than double the quantity of milk is received during the summer than during the winter, and the students thus have more of the practical work to do. Third, the summer term is longer, and the entire field of dairying and the related sciences can be covered, whereas in the winter term it is difficult to do more than give instruction in the actual work of making butter and cheese and the principles underlying the processes. In addition to the reasons mentioned, the student who has had but little practical experience in dairying can in the summer be given the most valuable instruction, because he becomes familiar with summer conditions, with which he mostly has to deal after leaving college. For these reasons we think that those who attend during the summer schools will be the ones to reflect the greatest credit upon the College, and that a strong effort should be made to build up these summer schools and indnce an increased attendance. If this course is followed the winter school will naturally become what might be called a training school, or normal, which dairymen who have had more or less experience can attend for ten weeks during the winter, when the milk supply is short and their business will permit of their absence, for the purpose of studying points that they do not well understand and become familiar with the most advanced methods. The course of study during the summer months is best adapted to give a thorough technical education in dairy lines.

The lockers ordered made, by the honorable board of trustees at its last meeting will be ready for use during the winter school. These lockers were asked for in order that each student might be given an outfit of the apparatus needed for his work in the dairy building. Having a secure place in which to keep his apparatus he can be held responsible for the same, and by requiring a deposit in advance sufficient to cover the cost of the outfit the College will suffer little loss from breakages.

We have found that all the available space in the test room, in which it was intended to place these lockers, is needed by the students in the work of testing, examining milk, etc. This makes it necessary that we should have another room in which to place the lockers. The room most available for this purpose is on the south side of the dairy building immediately over the cheese curing room. At the present time this room is not furnished; it needs to be lathed and plastered and floored. This should be done during the next three weeks so that it will be in condition to use by the time the winter school opens. If this is done it will give us a room much needed as a dairy lecture room, as the lockers can be arranged in such a manner as to leave considerable space. A room which can be used as a lecture room is much needed in the dairy building because in order to make a lecture more instructive, it is often necessary to have dairy apparatus and machinery before the class, and as the apparatus may be needed at any time it cannot be taken to other lecture rooms out of the building.

It is necessary that the cheese curing room be finished before we can hope to produce the best quality of cheese. At the present time neither the moisture nor the temperature can be regulated, and it is absolutely necessary that both of these be under control in order to secure proper curing of the cheese. The room should be lined with white lumber. In addition to this it is necessary that some arrangement be made for controlling the temperature in the summer. To handle both the commercial and experimental cheese to the best advantage the curing room should be divided with a partition into two rooms, so that the temperature can be suited to the stage of ripening.

With the growth of the dairy school it has become apparent that more room is needed in the dairy work room. This can be secured by throwing the rooms now used for cooling room and ice house into the main work room, and building a cold storage room on the east end of the dairy building. Estimates have been made on the cost of transforming the building formerly used for cold storage on the farm into a cold storage building for the dairy. It can be moved to the east end of the dairy building with little difficulty and once in position can be fitted for cold storage for about $600. A freezing system would increase the cost somewhat.

EXPERIMENT STATION.

JAMES WILSON, DIRECTOR.

The work of the Experiment Station since the last biennial report has been in directions regarded most beneficial to the farmers of the State, and is found in bulletins 16 to 21 inclusive. The farm section conducted experiments in feeding flax, meal and oil meal to meet inquiries of feeders who desire the relative feeding value of each, the amount of each that could be safely fed and the effect on pregnant animals. The indications from the feeding and facts found are recorded in bulletin 16 of this station. The crop report for 1891, giving methods of cultivation and yields of corn grown in farm conditions, with detailed accounts of the expense of growing, will be found in bulletin 16. The growing of barley, with detailed expense of work, the yield per acre and expense per bushel, are also found in bulletin 16. A careful inquiry into the making of silage, the cost of labor and results in feeding, are also reported in that bulletin. Bulletin 16 has also a detailed report of the growing of thirty different varieties of potatoes, with description and yield of each variety.

The great interest our State has in everything relating to the products of the dairy induced us to feed beets and potatoes to dairy cows, so as to get indications of the effect of roots and tubers on milk production and quality of butter made from rations having various quantities of these ingredients. The results will be found in bulletin 17.

During the winter of 1891-92 the station fed lambs to get indications of the effect of nitrogenous and carbonaceous feeds on the production of mutton, the relative cost of the feeds in making live weight, and the quantity of wool grown with the different feeds. This is recorded in bulletin 17.

The same bulletin has the results of feeding hogs of different ages on corn and buttern ilk, giving the grain of each lot, the ration and the value of corn at a given price for hogs.

Hog diseases frequently leave the dairyman without animals to consume skim milk when cows are being fed expensive products. This suggests to us the necessity of ascertaining the value of milk fed to cows giving milk, its effect on quantity and quality of milk, and on the cows drinking it. Indications will be found in bulletin 17. The adaptability of our farm conditions to mutton sheep and the interest taken in that class of farm stock, led us to feed seven breeds owned by the college in experimental conditions during the winter of 1891-92, to ascertain definitely what a breeding sheep requires of grains and coarse fodders in order to winter over in thrifty condition. During the ninety days' test, the grain consumed daily, the hay eaten daily by each breed, the weight of the fleece of each breed, the fibers and serrations per inch, the average per cent of scoured wool from each

breed, the average selling price, scoured and unscoured for each breed, and other facts interesting to flockmasters in the State. Bulletin 18 has the detailed report.

No department of the farm needs investigation at the present time as much as the horse industry. Iowa conditions produce the best, and yet the State is overstocked with undersized, unsalable horses, that are not needed as work animals, and cannot be disposed of at cost of production. Feeding and breeding are the factors that control horse growing and in order that this station might do what it could to gain information regarding the growing of the young horses, we began a series of experiments in the winter of 1891-92, to get definite results regarding the feeding of draft and coach fillies so as to get indications of the value of different feeds, of ground and unground grain, of skim milk, of roots and other fodders. Interesting results were found that were corroborated in a continuation of the tests during the winter 1892-93. The first experiment is found in bulletin 18 and the next in bulletin 21.

Bulletin 18 also contains a cut and description of our experimental and educational creamery building, and a farm creamery experiment, touching the skimming of milk on the farm and adding the cream to milk delivered at the creamery, and the practicability of fair determination of the value to patron and purchaser. The frequent drouths that occur in our State, shortening the pastures at different times during the summer, induced this station to turn attention to the various root crops to ascertain which of them are most at home in our climate and can be grown most profitably with our conditions. Bulletin 19 has a report of the growing of different varieties of mangold wurtzels, Swedish turnips, rutabagas and carrots, giving the tonnage to the acre of each, and characteristics. This bulletin has a report of the second test of growing sugar beets on the farm, dates of planting, sampling, weight of trimmed beets, percentage of sugar in the beets, and suggestions regarding cultivation. It is fairly well settled by these two trials that our State can grow sugar beets successfully, with as high per cent of sugar in them as is found in France and Germany, provided it would be remunerative, which the low price of sugar and the high price of labor prevents at the present time.

Bulletin 19 also contains a report of corn growing on land where; 1st, green rye had been plowed under just before planting; 2d, on spring plowed clover sod; 3d, on fall plowed wheat stubble, unmanured; 4th, on spring plowed corn stubble, unmanured; 5th, on spring plowed corn stubble, manured, and 6th, on spring plowed oat stubble, manured. The yields were from 64.5 bushels on the first to 92.1 bushels from the fifth. Showing us that the nutriments for corn must be immediately available.

Mr. C. B. Souter of Cedar Rapids, in 1891, donated to the station two tons of tankage, a highly nitrogenous manure, and very b neficial to all sorts needing fertilizers, as it contains a high per cent of phosphoric acid. This was spread on corn ground at the rate of five hundred pounds to the acre. No appreciable benefit could be found. In 1893, the station bought two tons more and applied it to corn ground at the rate of 1,000 pounds to the acre. Still no increase of corn was found. It is evident that the fields on which it was used do not need fertilizers. Bulletin 19 has the detailed experiments. The same bulletin has a trial of shallow and deep cultivation of corn after July 25th that does not affect the crop in any way. Also an experiment in growing grass seeds to ascertain to what depth they should be covered. Clover, timothy, tall meadow oat, and brome grass were covered from one-half inch deep to three inches, with decided benefit from two-inch deep covering.

Anticipating the time when most Iowa farmers may desire to grow wheat for home consumption, the station annually plants several varieties of winter wheat that are most promising. The season of 1891 gave us good results from most kinds sown; in 1892, all rusted badly but the Turkish Red. The season of 1893 has been a repetition of the experience of 1892. All but the Turkish Red were so much injured by rust that they were worthless. Bulletin 19 has detailed information.

So much interest attaches to the successful raising of a calf that this station deems it of value to conduct tests of the adaptability of our various grains to taking the place, as nutriments, of the fat removed by the separator. In bulletin 14 we compared ground flax and skim milk with full new milk. Bulletin 19 has a report of a trial on three pairs of calves of oil meal and skim milk; ground oats and milk, and corn meal and milk with a tenth of ground flax in the third. The corn meal and a tenth of ground flax gave much the best results. A third experiment being conducted with four pairs of calves will be reported in bulletin 22. Our object is to get facts by repeated trials, that we can present with assurance to dairymen who must raise calves on skim milk or destroy them.

Bulletin 19 also has a hog feeding trial with buttermilk alone, with buttermilk and corn in varying amounts, and with corn alone for comparison, and the effect of too much water in a ration. The evident need of green succulent crops to feed dairy stock during summer when drouths prevail has suggested to us the wisdom of experimenting with whatever is suited to our climatic conditions; and the scarcity of facts relating to this subject has induced us to grow and feed different plants, principally legumes, so that with repeated trials we may be able to suggest permanent additions to our field crops. For three seasons we have grown different varieties of peas from several countries to get those that are rust proof, of sufficient vigor and heavy yielding capacity. Bulletin 19 has a report on this subject. The tons cured and green of different kinds, their analysis by the chemist and other characteristics. The need of nitrogenous food to induce milk giving in cows and growth of young animals is becoming more evident as intensive agriculture is more imperative.

Bulletin 22 will have a continuation of our endeavors in this direction, where the details of the field culture, weight per acre, and value for milk producing will be found; with the effect on the quality of milk, the scoring of the butter made from each feed by the dairy experts, and the analysis by the chemist of the different butters for solidity and volatile acids. The plants fed were blue grass, peas and oats, clover, rape and sweet corn. We have cabbages, soft turnips, red table beets, mangolds and silage for winter experimentation in the field, the stable, the creamery and chemical laboratory, so that all the hints we may get from these several lines of research may bear at the same time on the plant. We have grown rape two years in succession, planting early and late in rows and broadcast, thinned and left growing thickly; we have fed it to different kinds of stock for different purposes, and have noted its growth, adaptability to our climate, and its effects on milk and butter, and are prepared to determine with regard to it. We will give chemical analysis, effect on dairy products and other observations in bulletin 22, now being prepared for the printer. We cannot yet recommend it affirmatively to our people. It is very liable to insect ravages, and may be better suited to more northern latitudes. Bulletin 19 has some notes concerning it. Iowa is the great beef producing state of the nation, and having abundant grains and fine grasses, will continue to occupy that position. During the summer of 1891 we planned a steer feeding experiment, designed to interest the owners of the several breeds of cattle in the State. We fed to a finish eighteen steers, comprising

nine different breeds, over three periods of three months each, on rations that are found on every farm, or may be. During the first three months each steer was fed separately in the barn, his feed weighed and the gain noted. The average gain per day was 2 48 pounds. During the second period of three months the steers were on grass on like conditions in two equal lots, one was fed corn meal and the other oil meal, both lots having about what they could eat. The lot that had corn meal gained 2 32 pounds average each day, at a cost of 4.31 cents a day; the lot that had oil meal gained 2.03 pounds average each day, at a cost of 6.21 cents. This was one of the objects of the experimenting.

During the last three months the lot were fed in a yard; the one that had corn meal on grass being given a highly nitrogenous ration, and the lot that had oil meal being given a more carbonaceous ration, to test the difference in finishing. The steers that had the nitrogenous ration gained during the period an average of 3.26, at a cost of 5.92 cents a pound, and the lot that had the more carbonaceous ration gained an average of 2.8 pounds a day at a cost of 6.38 cents a pound. This was the second object of the trial.

The gain per day for each steer for the nine months averaged 2.52 pounds. The feeding was done at a profit. The eighteen head were shipped to Chicago and a block test had showing the live and dead weight of each, the weight of all the parts and selling value, with every detail of interest. The beef breeds compare favorably with the best tests in the leading English markets. Bulletin 20 has a full report.

EXPERIMENTAL DAIRY.

The Board of Trustees in 1891 made provision for the erection of an experimental and educational creamery that should be incidentally commercial so as to furnish every day dairy conditions for experiment and instruction to the classes in the agricultural courses. It has been in operation nearly two years. It receives milk from one hundred and fifty farmers in the vicinity of the College, supplies the steward's department with butter and cheese and an increasing demand within the State. It is the workshop of the winter dairy school and the laboratory of students in the four years' college course. It is equipped with the best machinery obtainable, of various kinds for manufacturing milk into the highest selling products. It furnishes ample opportunity for experimentation in every step taken in butter and cheese making. It has a competent gentleman, Mr. F. A. Leighton, in charge of its commercial side, and who also gives practical instruction in the management of machinery. It has a professor in charge of experimentation, Mr. H. C. Wallace, who inquires into milk in all its changes toward the finished product. Bulletin 21 has a comprehensive experiment in cheese making, a subject greatly neglected in the nation. The article covers with minuteness every step in the operation of cheese making. Fifteen experiment cheeses were made with per cents of fat in the milk varying from 1.75 to 8.40 per cent and the law approximately discovered that governs the weight of cheese obtainable from a given per cent of fat. The chemist analyzed samples taken periodically to observe the changes that took place while the cheeses were ripening, and the bacteriologist studied samples to find the agencies of curing. Each cheese is treated separately, and the bulletin article will show in detail the amount of milk, fat per cent, casine and albumen, sugar, acid, ash, total solids, moisture, pounds fat, pounds casine and albumen of each.

There is more being prepared for the press. An article on butter making, containing the result of observation covering nearly a year of experimentation, to

arrive at complete recovery of fat from the buttermilk at churning. Bulletin 22 will explain the process and success of the endeavor. Samples from different parts of the State will indicate the losses current in the private dairies and creameries of the State.

EXPENDITURES OF EXPERIMENT STATION.

The expenditures in sections for the fiscal year ending June 30, 1893, are as follows:

Agricultural Section	$7,951.19
Chemical Section	720.65
Botanical Section	372.17
Entomological Section	303.38
Veterinary Section	283.30
Salaries	7,295.72
	$16,726.41

ENTOMOLOGY SECTION.

HERBERT OSBORN IN CHARGE.

The work in this section during the past two years has been carried on in the line blocked out at first, particular attention being given to the insects affecting grasses. The results of the studies in this direction have been published in various bulletins issued during the past two years. Of most importance probably are the investigations into the habits and methods of treating the leaf hoppers in pastures and meadows, and the study of the Clover Seed Caterpillar, which has proven a most serious pest during the past few years. Another line of study in progress is devoted to the life histories and migratory habits of plant lice; the species of most economic importance, as far as present indications go, being those that affect the roots of grasses and cereal grains.

Aside from the publications of studies here some articles have been published in the bulletins and a number in papers of the State, on various economic insects, with a view to distributing well known facts regarding insects, among the people of the State. Of these a paper on "Fruit and Forest Insects," published in Proceedings of State Horticultural Society, and one on "Iowa Farm Insects," published in a report of the State Agricultural Society, are the most extensive.

I have also, in connection with Prof. Pammel, published a paper on "Spraying."

Most of the investigations have been made at the station or upon specimens sent in, but I have made a trip to Des Moines to study an outbreak of insects in the nurseries at that point, and Mr. Sirrine has examined work of Clover Hay Worm at Dysart. I think it desirable that whenever possible, we should improve opportunities to visit localities where special outbreaks occur, not only for the sake of a study of the local conditions, but in order to more effectually inform the people of the locality as to measures of relief.

The increase in the correspondence of the section during the biennial period is, I think, a gratifying indication of the interest taken in the work by the people of the State.

While this work does not appear in published form, and the results are limited for the most part to the parties writing, it seems to me an essential part of the work, and while it involves a great deal of labor and time, I think it too important a

means of reaching the people for whom the station is working, to wish to limit it in any degree. In some cases, where the inquiries are of general interest, replies are published in some of the papers of the State, so as to accomplish a greater amount of good.

The collection has been steadily growing and is constantly becoming more useful in the determination of specimens sent to us for identification.

Last year we started a small apiary and during the season work in that line progressed very well till autumn when the hives were disturbed to such an extent as to interfere with wintering, and again early this spring frequent disturbance of the colonies prevented any success. On account of the difficulty of preventing such disturbance of the swarms, involving possibly the loss of choicest queens or interference with any experiment in progress, I believe it will be best to defer any extensive work in this line until we can have a house in which to keep the colonies and the apparatus connected with the work.

This could very properly be connected with a small insectary which would be a great advantage in carrying on studies of the life histories of some forms of insects.

A little building adapted to such work could be built at small expense and is, I think, really an essential if we are going to attempt anything in the way of agricultural experiments.

INVESTIGATION AND EXPERIMENTAL WORK IN BOTANY.

L. H. PAMMEL IN CHARGE.

During the past year we have been engaged in studying some problems connected with dairying. In Bulletin No. 21 a bacterium is described from which we may expect valuable results. Judging from the comments made on this work in some of our dairy papers and by scientific workers abroad we feel that this work is in the right direction. We have also given some attention to other bacteria in connection with dairy problems, especially those of cheese. We have continued experiments along the line of spraying, and although not extensive this year, the results with currants have been highly satisfactory. Spraying with currants this year closes our third year's experimentation, and so gratifying have been the results that we consider it as demonstrated that the diseases of currants can be prevented by the timely application of fungicides.

We repeated our experiments of 1891, spraying to prevent oats and wheat rust. Our results confirm those of a previous year and are in harmony with those made last year by Prof. Galloway in Washington. We stated at that time our conviction as to the impracticable nature of treating these diseases. In a later bulletin I discussed fully the subject of resistant varieties and suggested experiments along these lines. We have now started a series of tests and hope to breed wheats which will resist these troublesome fungus diseases. We have continued our work with the Plum Scab which was started some years ago and find that it is on the increase in Iowa. The results of our studies will soon be published in a bulletin. We have also continued our studies in crossing cucurbits, and the statements made at the meetings of the horticultural societies in this State have been vindicated in every respect. It is gratifying to note that many of our best gardeners and horticulturists are accepting my conclusions although they strenuously insisted that "mixing" of pumpkins and melons would occur. During the year we have made further

studies of a serious rutabaga rot and although we had surmised in 1892 that a bacterium was responsible for this trouble we have now obtained good evidence by a series of innoculations that this rot is caused by bacteria. We have also studied the Powdery Mildew of the apple which at times is very troublesome in the nursery in Iowa and other parts of the country.

The assistant has, during the year, given special attention to the subject of seed germination as well as studying impurities. A part of this work has been published in bulletin 21 and has been received very favorably by the agricultural press. It is a much needed work in the right direction. Too little is known concerning our American seeds and their impurities.

The writer has prepared in addition to the papers published in the bulletins of the Experiment Station, several for scientific associations and academies. I believe there is no better way to get recognition outside of the limits of our State than to present papers at such meetings. A paper which has consumed some time in preparation was printed in St. Louis Academy of Sciences. Most of the material was collected several years ago. The bibliography contains the titles of more than five hundred papers on root-rot, and will prove of great service to the mycologists of our country. Papers have also been prepared for the Iowa Academy of Sciences and American Association for the Advancement of Science. At the latter meeting in Madison I gave a short abstract on the Chromogenic Bacteria of Ames, which has engaged my attention at odd times for several years.

HORTICULTURE AND FORESTRY SECTION.

J. L. BUDD IN CHARGE.

A fairly correct conclusion can be reached in three or four years in regard to the prospective value of a variety of corn or of cereals. But the real value of an orchard fruit, shrub, ornamental tree, or forestry tree for general culture requires many years of observation on varied soils to determine its value in our changeable interior climate. Hence the line of experimental work in horticulture taken up sixteen years ago are still continued.

We now have over twelve hundred trial stations scattered over the west, and, indeed, across the continent, where the trees introduced by or originated at the central station are being tested, and from which reports are received. It is no longer disputed that our experimental work has advanced the interests of horticulture in all its varied divisions.

Our work in the distribution of trees is in no sense commercial. Promising new varieties are only sent to those who agree to give them careful attention, and in due time report on their relative value for the varied localities, elevations and soils.

At this time we are giving special attention to the vitally important work of hybridizing and crossing the fruits and some of our shrubs. For this work our facilities are better than at any experiment station on the continent, as we have blossoming trees and shrubs of the hardiest known varieties and species for use as mother stocks, and the pollen we are able to secure from any state in the Union or any country of the world. As an instance, we have recently crossed the Russian roses and our native species with pollen of the best garden roses received from St. Louis and other distant points.

We also have hybrids and crosses of most of the orchard fruits now from one to four years old. We will soon be able to propagate and distribute these new creations for trial.

We are also advancing horticulture by extended experiments in the way of using such little known or new stocks as the native sand cherry, the wild red cherry, and the dwarf apples of North Central Asia. As an instance we have budded and grafted many varieties of the plum and cherry during the past year on seedlings of the sand cherry (*Prums pumila*).

It may also be said that our station work is an important aid to our class-room work. In other words it makes the union implied in our college motto, "Theory with Practice."

VETERINARY SCIENCE SECTION.

DRS. M. STALKER AND W. B. NILES IN CHARGE.

The work of the Veterinary Section will consist largely of a study of the Aetiology of contagious and infectious diseases affecting domestic animals in this State. A true understanding of the causes of these diseases would enable us to successfully combat them by recommending suitable preventive measures. If opportunity offers, special attention will be given the corn stalk disease of cattle, the so-called hydrophobia of cattle and infectious abortion of mares. These diseases are not understood, and are not, therefore, with our present knowledge, preventable. We have in preparation some Mallein, an agent used in the diagnosis of glanders. If successful in its preparation it is our plan to furnish it for distribution to Iowa veterinarians. By this means they will be able to promptly diagnose doubtful cases, which should materially lessen the number of cases of this fatal disease.

Tuberculin, a similar agent to Mallein, has also given promise of becoming a valuable diagnostic agent. We wish to assist in settling this point by trying the agent in this State if opportunity offers.

In addition to the work mentioned, work along the line of experimental therapeutics will be carried on as heretofore. As will be readily understood, our work must depend largely on circumstances, and it is consequently impossible for it to be definitely outlined.

In regard to our facilities it may be stated that the laboratory facilities are ample, but that we are very much in need of a small building for experiment animals. In the study of most animal diseases, experimental inoculations *must be made*. Without them but little can be learned, hence without a place for keeping animals for this purpose our work falls short of what it should be.

It is hoped that some arrangement can be made whereby this part of the work can be presented wherever necessary.

AGRICULTURAL CHEMISTRY.

G. E. PATRICK, PROFESSOR.

The work in this department is of two distinct kinds:
First—Of instruction, or college work proper.
Second—Of investigation, or experiment station work.

WORK OF INSTRUCTION.

This is confined to juniors and seniors in the course of agriculture, all students in the course of dairying, and graduate students who elect agricultural chemistry. Of the last named there are three enrolled for the present year. There are three distinct courses in dairying in the year. One during each college term and one in the winter vacation; therefore, this part of the work is nearly continuous throughout the year.

Among the principal topics treated in the two and four year courses are the following: The chemistry of the air, of soil, soil gases, soil waters, and the relation of all these to plant life; production and fixation of plant food by soils; sources of available nitrogen, nitrification, the nitrogen gatherers, reduction of nitrates, losses of nitrogen, its conservation on the farm; soil depletion by different crops; the chemistry of fertilizers, natural and artificial; soil and fertilizer analysis; the chemistry of plants; chemical changes during germination, growth and seed formation; translocation of matter within the plant; study of particular farm crops in relation to soil fertility and depletion; fodder analysis; sugar producing crops and their valuation by analysis; chemistry of the animal body; digestion, nutrition, metabolism, production of flesh, fat, milk, wool and working energy; digestibility of fodders; chemistry in the science of feeding animals, compounding and balancing rations; chemistry of the dairy products, including methods of analysis.

Instruction is given by lectures, supplemented by books of reference; also by exercises in the laboratory where the student studies nature at first hand and learns direct from her. The constant aim is to make the instruction practical as well as scientific, so that the knowledge acquired by the pupil may be of direct and material aid to him in his future vocation as farmer, dairyman, stock feeder, creamery man, sugar grower or manufacturer, or agricultural chemist.

The greatest need of this department, up to the present time, has been for more room, but this need will soon be, in a large measure, if not fully, supplied by the new quarters provided for the department in agricultural hall.

EXPERIMENT STATION WORK.

This goes on without intermission year in and year out. The writer and his assistant are each on constant duty eleven months in each year, and sometimes twelve.

The work done during the past two years has, in part, been published in Bulletins 16, 17, 18, 19, 20 and 21, the work being upon various phases of the dairying industry, upon the chemical changes in the maize plant during ripening (when to cut corn, a joint experiment with Prof. Kent), and upon the culture of sugar beets in Iowa, the latter being a joint experiment with many farmers of the State. A considerable part of the work of the year has not yet been published.

During the present year this section of the station in the course of the larger investigations undertaken, aside from the sugar beet work, has made analyses of the kind and to the number as follows, including duplicates made to secure accuracy:

Complete fodder analyses	70
Complete milk and whey analyses	152
Complete cheese analyses	163
Nitrogen determinations, not included in above	186

Fat determinations by Babcock test, several hundred.

In addition to the work originating here at the College, this department has done a considerable amount of work (gratuitously) for persons in various parts of the State. This class of work has included the analysis, or investigation, of soils, potable and mineral waters, coal, various minerals, borings from wells, vinegars, honeys, suspected butters, alleged poisonous cheese, etc.

The correspondence of this department with citizens of the State, relative to such subjects as those above named, and others, is quite extensive; but the time required is freely given, in the hope it will aid those for whom we are working, those who have ability to support this institution, viz. the people of Iowa.

FRENCH AND GERMAN.

CELIA FORD, PROFESSOR.

The aim has been to give students, together with knowledge of the structure and inflections of the French language, as large a vocabulary as possible. To this end drill has been given in rapid sight reading, in translating from English into French, and in writing from dictation. An effort has also been made to make the ear keep pace with the eye in acquiring the new language.

The training in the third term's work, in which there will be class work next year, will be in the idiomatic French of conversation and in French literature.

GERMAN.

The German classes have been composed of students in the course for ladies, in the course of civil engineering and in the course in sciences related to the industries. The students of the first year study the grammar, translate short German stories and learn ten selected poems. The nature and aim of the work corresponds to that of the first year class in French.

The second year's work consists of a rapid review of the grammar, translation from English into German, reading novels and poems, together with selected plays of Schiller, Lessing and Goethe.

HISTOLOGY AND PATHOLOGY.

IRVING W. SMITH, PROFESSOR.

The instruction in this department includes normal microscopic anatomy, being a continuation of the biological work previously required, and the general survey and recognition of diseased parts in animals both in life and at post mortem examinations in the veterinary hospital and dissecting room. Also the gross and microscopic view of preserved morbid tissues and the bacteriology of the infectious diseases. Systematic lectures extend over three half years. The laboratory is equipped with microscopes and accessory apparatus, and for a year and a half the student has weekly practice in preparing and examining specimens by which natural and diseased tissues may be recognized. In addition to the work done by various members of the veterinary staff, special instruction is given by Prof. Osborn on animal parasites, and by Prof. Pammel in bacteriology.

Our work is now being done in cramped quarters, where we are intruders; and there is great need for the completion of adequate laboratory facilities as designed in the now unfinished upper floor of agricultural hall. We most earnestly request means to this end in time for the next year's work.

RHETORIC AND LATIN.

MARGARET DOOLITTLE, PROFESSOR.

RHETORIC.

I am much pleased to report an advance in the study of English language. Not only has the standard been raised and the amount of required work increased, but a marked interest is manifest in all divisions of the work. Students in courses not including rhetoric frequently take the work additional to other studies. English is required in all courses the first half of the freshman year.

The object of the term's work is to familiarize the student with the principles of correct and effective expression. A knowledge of English grammar is required for entrance, but there is a practical review of the more important principles, including punctuation and capitals.

In this term especial attention is given to clearness and aptness of speech; this involves considerable drill in the building of words from roots, and in the discrimination of synonyms. The work of the text book is supplemented by library reference and lectures, together with a brief history of the language. Such written exercises as are practical are prepared and criticised.

During the second term (half year), all freshmen, except of the veterinary course, pursue the study with a view to an effective use of words and an appreciation of good literature. Preparatory to the study of literature later in the course, the principles of criticism are studied. The more important kinds of oral and written discourse are studied, analyzed and produced. All written exercises are critically examined, and most of them returned to the student for further work. Oral and written reviews are so planned as to be both a test of matter learned and a drill in expression.

A large part of such work is done by outlines and lecture notes that require individual investigation of the topics in the library. The science courses and the agricultural course have rhetoric in the first half of the sophmore year. Here rhetorical analysis, a study of the laws and forms of thought and practice in debate and theme writing constitute the work.

SPECIAL CRITICISM.

The sophmores in the course for women and the science course write one paper each term, and the juniors and seniors in all courses write one oration each year. All these are carefully criticised and changes suggested.

ENGLISH GRAMMAR.

Preparatory students study English grammar the last half of the year, *i. e.*, all the time that the preparatory department is in existence. Letter writing and the simple kinds of discourse receive attention here.

LATIN.

The work in Latin is not changed. It is studied two years chiefly as a supplement to the English language and to the sciences, and is therefore limited to the courses related to these studies.

LIBRARY.

FANNY THOMAS, LIBRARIAN.

During the last two years the library has purchased about 2,000 volumes. The number of books added during the year ending November 8, 1893, was nearly double the average annual additions of previous years. While the current books and necessary publications have been carefully kept up, it has been especially a year of advance in facilities for study and investigation. This is the result of some definite policy on the part of the library. Among the purchases during the year were a number of costly and valuable publications obtained from dealers in second hand books at a very low price. Among these additions we note, Zoological Record vol. 1-28; Magazine of American History, vol. 1-26; Thorpe's Dictionary of Applied Chemistry, vol. 1-3; Hare's System of Practical Therapeutics, vol. 1-3; Lingard's History of England; Walpole's History of England; Appleton's Cyclopedia of United States History.

The Department of Literature has grown greatly and added valuable volumes to its already rich store. Among those additions we mention the complete works of Browning, Tennyson, Lessing and Heine.

The library administration and the work done by the freshman class as laid down in the College curriculum have not changed in any way since my last report.

LIBRARY HOURS.

Five days of the week the library is open to visitors the following hours:

From 8:00 to 12:00 M., from 1:00 to 5:15 and 7:00 to 9:30 P. M.

On Saturdays visitors are admitted from 1:00 to 5:30 P. M. On Sundays from 1:00 to 5:30 and 8 00 to 9:30 P. M.

ACCESSION BOOK.

During the last two years the accession book shows an increase of 2,000 volumes, not including donations and government publications.

Additions to the various classes are as follows:

General works	100 Volumes.
Philosophy	20 "
Religion	100 "
Sociology	50 "
Philology	80 "
Natural Science	250 "
Useful Arts	80 "
Fine Arts	10 "
Literature	400 "
History	300 "

The broken sets of periodicals that have been completed have brought permanent value into the library.

CATALOGUE.

The card catalogue has grown with our volumes, and the help it offers the students is being more appreciated as the reader learns to use it. The catalogue will always be kept up to date, and efforts made to make the classification still more minute.

READING ROOM.

All the leading magazines published for different departments are purchased for the library. We have twelve daily papers and about 250 State papers. The latter are donated by the State editors, and the students appreciate the courtesy shown them. Among the papers outside the State of Iowa are the following: *New York Tribune, Chicago Tribune, Halifax Herald.*

VISITORS.

No attempt has been made to keep an accurate estimate of daily visitors to the library, but not less than 350 visit the library daily.

PHYSICS AND ELECTRICAL ENGINEERING.

W. S. FRANKLIN, PROFESSOR.

INSTRUCTION.

The department now offers instruction in the following topics:

1. Mechanics and Heat, five hours per week, spring term.
2. Elementary Mechanics, five hours per week, spring term. (For engineers).
3. Heat, three hours per week, fall term. (For engineers).
4. Light and Sound, three hours per week, spring term.
5. General Astronomy, five hours per week, fall term.
6. Spherical and Practical Astronomy, three hours per week, fall term.
7. Photography, one lecture per week, fall term.
8. Electricity and magnetism, five hours per week, fall term.
9. Dynamo Electric Machinery, five hours per week, spring term.
10. Applied Electricity, four hours per week, fall term.
11. Physical Laboratory, Photography, two afternoons per week, fall term.
12. Physical Laboratory, Mechanics, etc, two afternoons per week, spring or fall term.
13. Physical Laboratory, Elementary Electrical Measurements, two afternoons per week, spring or fall term.
14. Physical Laboratory, Electrical Testing, two afternoons per week, spring term.
15. Physical Laboratory, Dynamo and Motor Testing, two afternoons per week, fall term.
16. Electrical Designing, one afternoon per week spring term, two afternoons per week fall term.
17. Theses in physics and in electrical engineering.

LABORATORY WORK.

The laboratory topics are given above, Nos. 11 to 16 inclusive.

Two distinct grades of laboratory work are offered. First, elementary or introductory work; second, advanced work. The first grade can be carried on in second floor rooms, and with a number of students in a room. The second grade work cannot be done satisfactorily on second floor of any building, and cannot be done when there are many students in a room.

In the leading institutions of learning, both technical and general, the class work of the professor of physics is always so arranged that elaborate experimental illustrations and demonstrations can be introduced into the class room, requiring a large amount of work preliminary to each lecture. The advantage of such arrangement is of course obvious. With us this is unattainable considering the quantity and arrangement of work done by the department. The evil effects of such meagre class demonstration can be obviated to a very great extent by providing sufficient laboratory equipment and satisfactory laboratory space, and encouraging students to supplement class work by laboratory work. This is the direction in which the department work is being pushed.

APPARATUS.

During 1892 and 1893 apparatus to the value of about $3,200 has been constructed under the supervision of the department. In the manufacture of this apparatus about $460 has been paid to the mechanical department, about $440 has been paid to students working under supervision of physics department, and materials to the value of about $1,200 have been used. Standard apparatus to the value of about $600 has been purchased by the department during the two years.

NEEDS OF THE DEPARTMENT.

Of the class work done in the department about one-fifth is devoted to electrical engineers alone; one-fifth to all engineers alike; one-fifth to all students alike, and two-fifths to general students, ladies and agricultural students. Counting work double when the class is divided into two divisions.

This shows that the department is responsible for much in addition to the special electrical work of the electrical engineering course. It is my desire to meet all the demands of the College for instruction in my department with that degree of thoroughness which their importance demands without regard to my particular interest in this or that line of special work. The present urgent needs of the department are:

(*a*) An astronomical observatory for students' use.

The course in spherical and practical astronomy is offered to civil engineers, and the course in general astronomy is optional. The first of these cannot be made even intelligible unless the class work is accompanied by actual instrumental work, and the second topic loses most of its force unless accompanied by such facilities as are afforded by an astronomical observatory. Popular ideas of astronomical observatories come from the many articles and books descriptive of our great observatories, and it is consequently not generally known that for about $5,000 an astronomical observatory can be built and equipped, and for general purposes of instruction leave very little to be desired.

(*b*) A magnetic observatory, or "copper house."

Much of the advanced laboratory work in electricity and magnetism cannot be done with any sort of satisfaction in a building which contains iron, in which students are continually moving to and fro, or which is adjacent to dynamo rooms and mechanical shops. An isolated one-story building of wood, put together with copper and brass nails and bolts, heated with a copper stove, having a cement floor and provided with solid stone piers, is necessary for such work. Such a building, 27½ x 42½ feet, costing about $1,000, would answer the purpose of a "copper house" for this department.

MECHANICAL ENGINEERING.

G. W. BISSELL, PROFESSOR.

The headquarters of the department are in engineering hall, of which the basement and the first and second floors are given up to its use.

The machine shop occupies two rooms of the first floor and is equipped with the following tools and appliances: A 24x24 planer, a Brainard milling machine, a Browne & Sharp universal milling machine, a shaper, two drill presses of eighteen and twenty-five inches respectively, two emery grinders, a polishing wheel, a cutting-off machine, six engine lathes having capacities of ten to twenty inches swing and three to eight feet centers, and three speed lathes. A set of pipe cutting and threading tools for pipe up to four inches in diameter are also a part of the equipment, which is completed by a very good assortment of small tools in the tool room and about seventy feet of work benches fitted with vises for light and heavy work. The equipment of the blacksmith shop consists of eight Buffalo forges with anvils, tongs, fullers, swages, etc. These are housed in a rough-looking lean-to outside the machine shop. A fan blower in the latter shop furnishes blast for the forges. On the second floor of the building are recitation and drawing rooms and the office and reading room of the department. Besides these accommodations in engineering hall, the department occupies the power house and the carpenter shop. The latter is a two-story frame building and contains, besides buzz saw, planer and jig saw, fourteen wood turning lathes and work benches and small tools to accommodate twenty students working at one time. The power house, which was but recently completed, contains a fifty horse power boiler and a twenty horse power engine which furnish power for running the several shops, which are reached by belting and shafting. The size of this building is such that it also accommodates the mechanical laboratory of the department. The equipment of the latter, in addition to the engine and boiler above mentioned, consists of a Wheeler condenser presented by the makers, a two-inch Worthington water meter presented by the makers, a Holly duplex pump made by the students from castings and drawings furnished by the makers, injectors, weir and weighing tanks, a Crosby steam gauge tester, fan blowers for experimental work, a 50,000-pound Olsen testing machine for testing the strength of materials in tension, compression and flexure, gas analysis apparatus for determining the efficiency of combustion in steam boiler furnaces, two Crosby, two Thompson and one Richards steam engine indicators for measuring the horse power of steam engines and gas engines, dynamometers, Prony brakes, platform scales and some other apparatus accessory or essential to experimental engineering.

The system of instruction in the shops is a combination of exercise and the "job work" methods, the former being abandoned as the student becomes proficient, if he also shows the possession of a sufficient amount of gumption for the latter. The drawing room work begins with free hand drawing and object drawing and perspective, and is followed successively by machine sketching, mechanical and kinematic drawing and designing. The latter division occupies the last year and a half of the course.

Experimental work begins in the middle of the junior year and extends to the end of the course. The scope of the work is indicated by the following list of experiments: Tensile, transverse, and compression tests of materials of construction, properties of lubricants, measurements of power by absorption and transmission of dynamometers, steam gauge and indicator calibration, cement testing, flue gas analysis, indicator practice, variation of engine speed, fan blower tests, calorimetry as applied to the determination of the moisture in steam and the temperature of furnaces, weir and water meter calibration, efficiency tests of steam engines, boilers, injectors and steam heating, lighting and pumping plants, and thermal analysis of the steam engine.

The instruction in the various studies and manual work is thorough and interesting to the earnest student.

The following is the complete course of study in mechanical engineering:

FRESHMAN YEAR.

First Term.	*Second Term.*
Algebra, Advanced—5.	Geometry—5.
English Language—5.	Algebra, Advanced—3.
History—3.	Rhetoric—3.
Free-hand Drawing—2.	Mechanical Drawing—2.
Shop Work—8 hours.	Shop Work—8 hours.
Military Drill—2.	Military Drill—2.
Elocution—1.	Library Work—1.
	History—2.

SOPHOMORE YEAR.

Physics—5.	Analytical Geometry—5.
Trigonometry—5.	Chemistry—3.
Discriptive Geometry—5.	Laboratory—2.
Mechanical Drawing—2.	Physics—3.
Shop Work—8 hours.	Mechanical Drawing—1.
Military Drill—2.	Shop Work—8 hours.
	Military Drill—2.

JUNIOR YEAR.

Calculus—5.	Economic Science—5.
Mechanics—4.	Mechanics—4.
Chemistry—3.	Materials of Construction—3.
Mechanical Drawing—2.	Physical Laboratory—1.
Laboratory—2.	Shop Work—2.
Shop Work—8.	Mechanical Laboratory—1.
Military Science and Drill—1 (optional).	Mechanical Drawing—1.
	Military Science and Drill—1 (optional).
	One Oration—1 (required).

SENIOR YEAR.

First Term.	*Second Term.*
Machine Design—3.	Electricity—5.
Hydraulics—4.	Laboratory—2.
Mechanical Laboratory—2.	Thesis—3.
Mechanical Drawing—2.	Machine and Design—3.
Steam Engine—2.	Mechanical Drawing—2.
Shop Work—8.	Mechanical Laboratory—1.
Military Science and Drill—1 (optional).	Thermodynamics—2.
One Oration—1 (required).	Drill—1 (elective).
Selected or Special Work—2-5.	

The number of students who have chosen the engineering courses upon entering the College has been steadily increasing with the growth of the College until the present date finds the shop space and equipment sorely taxed to accommodate the classes. The question of how to do this with the present facilities is serious, and the need of new shops which has been urged upon previous occasions is now presented with renewed force, and is again urged upon your attention as a demand which must be met very soon unless it is considered that education in the mechanic arts can and should be withheld from those of our students who ask for it.

We need new shops. Three buildings, one story, 40x150 feet, are recommended. one to be used for forge shop and foundry, one for a carpenter shop, and one for a machine shop. Of these we need most imperatively the first two. The estimated cost of the three buildings with equipment needed for them in addition to what we already have is about $25,000, and any one or two of them can be erected for a proportionate amount.

Graduates of the enginering courses of this College are gaining fame, and reflecting credit upon their alma mater. Their number is increasing year by year. Why, by inadequate provision for their education, should the people of Iowa diminish this annual addition to the rank and file of the engineering profession?

CIVIL ENGINEERING.

A. MARSTON, PROFESSOR.

The two years which have passed since the last biennial report was made have formed a period of prosperity for this department. The number of students has been large, additions have been made to the equipment, and the professional work of the course has been extended and improved.

The course of study in civil engineering is so arranged as to include a thorough drill in mathematics and the sciences in addition to the technical studies. In these lines our students have the advantage of the excellent work done by the other departments of the College. That work needs no description here, and only the technical studies of the course will be taken up in detail.

The work in drawing extends throughout the course and includes free-hand and instrumental drawing, lettering, instruction in the use of water colors in technical drawing, the solution of problems in descriptive geometry, shades and shadows and linear perspective, the making of plats, maps and profiles from original surveys, and the making of plans of stone and metal bridges.

In surveying instruction is given in land, topographic, hydrographic, mining and city surveying. The instruction is by recitation and field work. The students make an actual location of a short line of railway, including the preliminary survey, the construction of a contour map on which a proper location is laid down, and the running in of the latter in the field. They also cross-section and compute the earth work and plan the bridges and culverts. The course extends throughout the junior year.

In engineering laboratory work the students are given practice in hydraulic work and in testing the strength of materials of construction. The apparatus for the hydraulic work and for cement testing has been added to the equipment of the department since the last biennial report.

A thorough course in mechanics extends through the junior year.

In the senior year the work is almost wholly in lines of direct application to engineering work. It includes hydraulics, the designing of stone arches, bridge and roof stresses and designing, hydraulic engineering, sanitary engineering and the study of masonry structures and foundations. An actual design is made for a stone arch bridge and also one for a metal bridge.

The advance of the department in these lines of work gives rise to many needs. Of these the ones most immediately pressing are for money to thoroughly renovate the rooms of the department, to provide a room and apparatus for an hydraulic and testing laboratory, to purchase models, specimens and views of engineering works for an engineering museum, to provide more field instruments. It is hoped that these wants may be provided for in the near future.

MINING ENGINEERING.

J. R. LINCOLN, PROFESSOR.

A fair start has been made in the work of mining engineering. But there should be much more energetic advertising of this course.

The work in mining engineering the last year has been confined to the senior civil engineers in tunneling.

Although the work called for by this class in one term was really greater than should have been attempted, yet a sufficient amount of instruction was given to enable them to understand the leading systems of tunneling.

In addition to the class work, some time was spent in visiting mines. I believe it to be only a matter of time until the course in mining engineering will become popular and useful in giving instruction in the best methods of developing the rich mineral resources of our State.

Arrangements can be made for students to take short courses in mining engineering but the long course of four years, is preferable. The following is the complete course of study, embracing four years:

THE COURSE IN MINING ENGINEERING.

FRESHMAN YEAR.

First Term	*Second Term.*
Algebra, Advanced—5.	Algebra, Advanced—3.
Drawing—2.	Drawing, Mechanical—2.
Elocution—1.	Geometry—5.
English Language—5.	German—5.
German—5.	Library Work—1.
Military Drill—2.	Military Drill—2.
Shop Work—8 hours.	Shop Work—8 hours.
Sight Singing—1.	Sight Singing—1.

SOPHOMORE YEAR.

Descriptive Geometry—5.	Analytical Geometry—5.
Land Surveying—2.	Chemistry—5.
Fires—1.	Laboratory Practice—3.
Military Drill—2.	Military Drill—2.
Physics, Mechanics—5.	Physics, Heat—3.
Trigonometry—5.	Surveying, mining and topograpical—3.
Shop work—8.	

JUNIOR YEAR.

Spring Term.	*Fall Term.*
Analytical Mechanics—4.	Electricity and Magnetism—5.
Chemistry—2.	Chemistry, Blow-pipe Analysis—1.
Laboratory Practice—3.	Laboratory Practice—2.
Calculus—5.	Mechanics—4.
Mineralogy, Crystallography—3.	Mineralogy—2.
Laboratory Practice—1.	Laboratory practice—2.
Mining—2.	Mining—4.
Military Drill—1 (optional).	Military Drill—1 (optional).
	One Oration—1.

SENIOR YEAR.

First Term.	*Second Year.*
Dynamo Machinery—4.	Engineering Laboratory—4.
Laboratory Practice—2.	Economic Geology and Petrography—3.
Geology—5.	Laboratory Practice—2.
Hydraulics—4.	Materials of Construction—
Metallurgy and Assaying—1.	Metallurgy and Assaying—1.
Laboratory Practice—2.	Laboratory Practice—2.
Mining—2.	Tunneling—3.
Steam Engine—2.	Thesis—2.
Thesis, begun.	Military Drill—1 (optional).
Military Drill—1 (optional).	
One Oration—1.	

MUSIC.

MARIE LEWIS CHAMBERS, DIRECTOR.

The work of this department continues to increase in amount, broaden in character, the interest in it to deepen and its influence to be more widely felt from year to year. There are three teachers of music. The director gives special attention to voice culture and all the vocal music of the College, Miss Genevieve Westermann to piano, organ and theory and harmony, and Miss Carrie Scott to violin. Each has given years of conscientious study under the best masters of the country to her own specialty and is exceptionally well qualified to instruct in it. The course of study provided in voice, piano, organ and violin is thorough, comprehensive, strictly classical, and is imparted with the most effective modern method. It may be completed in such time as the ability and application of the student permits,—generally within the limits of the four years College curriculum.

A large number of students have registered for private lessons since the last report. The free lessons in sight singing will be made obligatory with all freshmen at the beginning of the next year. A chorus choir has been under consistent and careful training and has sung creditably at all the public religious services of the College. Public concerts have been given by the instructors in the department at the opening of each term and at commencement and pupils' recitals have been given upon two or three evenings of the term and every Saturday morning,—the latter for pupils only and for criticism. These programs have been attended by large and enthusiastic audiences and a growing interest in them in manifest in College and community.

One new upright piano has been added within the last year, to those already in possession of the College. The College has no pipe organ since the old one has been sold and needs that efficient instrument very much.

The department has recently been gratified by an action of the Board which appropriated a building recently vacated to its exclusive use. It will be occupied at the opening of the next College year.

FINANCIAL REPORTS.

REPORT OF THE SECRETARY.

IOWA AGRICULTURAL COLLEGE,
November 21, 1893.

To the Honorable Board of Trustees:

The following is a condensed statement of the financial transactions of the biennial period and the present condition of the different College funds, as shown by the account kept in my office with the several officers handling these funds:

ENDOWMENT FUND.

The total endowment aggregates $680,772.53, an increase over the amount reported at the close of the last biennial period of $987.53.

The fund is credited to the following sources:

Congressional land grant	$ 591,093 02
Transfer and investment of interest fund	89,679.51
Total	$ 680,772.53

It is managed by the Board of Trustees through:

(*a.*) The financial agency, W. A. Helsell, agent.
(*b.*) The land and loan agency, Herman Knapp, agent.
(*c.*) The bond department, under the direct control of the Board.

(1) THE FINANCIAL AGENCY.

At the beginning of the biennial period the uninvested balance was		$ 19,531.38
Loans have been paid during the two years amounting to		74,522 18
Proceeds of land sold have increased the loanable funds of the agency		52,500 00
Making a total to be invested of		$ 146,553.56
Of this amount the agent has loaned		142,541.06
Leaving an uninvested balance of		$ 4,012.50
In hands of financial agent	$ 3,100.00	
In hands of State Treasurer	912.50	
Total	$ 4,012.50	

I have prepared for your examination a statement giving the condition on November 1, 1893, of each loan in the department. This statement shows that the

Loans bearing eight per cent interest amount to		$ 53,542.41
Loans bearing seven per cent interest amount to		406,507.92
Making a total invested of		$ 460,050.33

These loans are payable as follows:

In 1894	Loans $ 77,350.00		
	Taxes 100.33		
		$	77,450.33
In 1895			57,750.00
In 1896			79,750.00
In 1897			140,500.00
In 1898			63,150.00
In 1899			41,450.00
Total		$	460,050.33

The entire amount of the endowment fund turned over to the agency since its establishment is accounted for as follows:

Invested in farm mortgages	$ 460,050.33		
Awaiting investment	4.012.50		
		$	464,062.83
Mortgages foreclosed—			
Tract in Ringgold county, 120 acres	$ 1,200.00		
Tract in Polk county, 40 acres	2,418.55		
		$	3,618.55
Total		$	467,681.38

(2) LAND AND LOAN AGENCY.

There has been patented during the biennial period:

Land belonging to the congressional grant, acres	14,929.97	$ 52,500.00
Land purchased with accumulated interest, acres	1,960.00	5,720 00
Total	16,889.97	$ 58,220 00

The first of the above amounts, $52,500.00, was forwarded to the State Treasurer and added to the loanable funds of the financial agency. The remaining sum, $5,720.00, was remitted through the State Treasurer to Agent Knapp to be invested in farm mortgages as provided in his contract with the Board for the investment of accumulated interest fund.

I submit with this report a statement giving the condition of each tract of land owned by the College. The statement also shows the number of acres and aggregate value of leases at the different prices and the amount of the principal of such leases falling due each year.

The leases aggregate 36,475.20 acres, appraised at $125,262.14. They fall due as follows:

In 1894	$ 23,758.62
In 1895	31,764.72
In 1896	23,045.46
In 1897	11,652.35
In 1898	5,848.00
In 1899	2,754.13
In 1900	18,038.86
In 1901	6,160.00
In 1902	2,240.00
Total	$ 125,262.14
In the loan department of the agency there was at the beginning of the biennial period an uninvested balance of	$ 1,005.00
Loans have been paid during the year amounting to	10,265.00
Land has been patented amounting to	5,720.00
Making the total to be loaned	$ 16,990.00
Of this sum Agent Knapp has loaned	$ 16,400.00
Leaving an uninvested balance of	$ 590.00

The two tracts of land obtained by foreclosure of endowment fund mortgages have been transferred to the land department. One, the Ringgold county tract, has been leased for ten years; the other, the Polk county tract, has been leased simply by the year and is subject to the order of the Board. Including these tracts, the following is a summary of the present condition of the agency:

Land under lease at 8 per cent, including Ringgold county tract, which cost endowment fund $1,200.00.			$ 126,462.14
Farm mortgages, at 7 per cent			80,450.00
Land under lease, 429.67 acres	$ 1,289.01		
Polk county tract, 40 acres	2,418.55		
Cash balance—accumulated interest uninvested	590.00		
		$	4,297.56
Total		$	211,209.70

(3) BOND DEPARTMENT.

The bonds of the Des Moines Security Loan and Trust company, amounting to $5,500.00, bearing 6 per cent interest, fell due during the year, and under the orders of your honorable body were extended for ten years at the same rate of interest.

I have made careful comparison of the accounts of the different officers connected with the management of the College endowment fund with the books in my office and find them to agree. I am satisfied that the accounts of these officers are correct.

The following summarizes the present condition of the endowment fund:

CONDITION OF ENDOWMENT FUND.

Yielding income—			
Land under lease at 8 per cent		$ 126,462.14	
Farm mortgages at 8 per cent		53,542.41	$ 180,004 55
Farm mortgages at 7 per cent			486,957 92
Bonds at 6 per cent			5,500.00
Not yielding income—			
Land		$ 3,707.56	
Cash	$ 4,012.50		
	590.00	4,602.50	8,310.06
Total			$680,772.53

TOTAL RECEIPTS AND DISBUSEMENTS.

The income of the College from its support funds and the expenditures on account of the different College departments are given in detail in exibits "A," "B" and "C" attached to this report. The experiment station is not included in the exhibits mentioned, being reported elsewhere.

The following are the total receipts and disbursements of the College as determined by the accounts kept by me with the College treasurer:

RECEIPTS FOR 1892.

Cash on hand at the beginning of the year			$ 30,001 84
Receipts from national sources—			
Support fund	$ 62,417.73		
Experiment Station fund	15,000.00		77,417.73
Receipts from State appropriations			39,989.33
Receipts from students—			
Room rent	$ 2,302 00		
Hospital fund	609.00		
Diploma fund	200.00		3,111.00
Receipts from sales—			
Sales by Experiment Station	2,041.72		
Sales by other departments	32,265.60		34,307 32
Donations, rent on land			3 20
Endowment, accumulated interest paid in to be reinvested—			
Principal of loans	$ 2,565.00		
Principal of land leases	3,200 00		5,765 00
Total			$190,595.42

DISBURSEMENTS FOR 1892.

Expended on College departments—			
Salaries	$ 32,671.59		
Expenses covered by sales, including purchase of cream for creamery	32,265.60		
Apparatus, assistants and expenses paid from support funds	37,555.86	$ 102,493.05	
Expended on account of Experiment Station, including sales			17,061.03
Expended on account of State appropriations			40,936.12
Expended on student accounts—			
Room rent	$ 3,299.94		
College hospital	598.11		
Diploma fund	203.25		4,101.30
Invested in farm mortgages			$ 6,100.00
Refunded to lessees from railroad damage fund held in trust			176.00
Total disbursements			$170,867.50
Cash balance on hand			19,727.92
Total			$ 190,595.42

RECEIPTS FOR 1893.

Cash on hand at the beginning of the year			$19,727.92
Receipts from national sources—			
Interest fund	$ 43,928.73		
Morrill support fund	19,000.00		
Experiment station fund	15,000 00		77,928.73
Receipts from State appropriations			31,163.80
Receipts from students—			
Room rent	$ 2,568.12		
Hospital fund	758.50		
Diploma fund	629.00		3,955.62
Receipts from sales—			
Sales by experiment station	$ 2,208.79		
Sales by creamery	21,374.87		
Sales by other departments	18,352.03		41,935.69
Donations, rent on land			3.20
Endowment, accumulated interest paid in to be reinvested—			
Principal of loans	$ 7,700.00		
Principal of land leases	2,520.00		10,220.00
Total			$ 184,934.96

DISBURSEMENTS FOR 1893.

Expended on College departments—		
Salaries	$ 34,221.96	
Expenses covered by sales, including purchase of cream for creamery	39,726.90	
Apparatus, assistants and expenses paid from support fund	28,897.51	$ 102,846.37
Expended on account of experiment station		$ 18,535.92
Expended on account of State appropriations		31,222.98
Expended on student accounts—		
Room rent	$ 2,956.18	
College hospital	987.42	
Diploma fund	149.79	4,093.39
Invested in farm mortgages		10,300.00
Donation fund, paid for loan register		19.50
Total disbursements		$167,018.16
Cash balance on hand		17,916.80
		$184,934.96

Attention is called to the fact that the totals given above do not represent the ordinary income of the College, nor the expense of maintaining it. Several departments of the institution, as for instance the farm, creamery and work-shop, are not only educational but commercial. Their receipts and disbursements on commercial account largely increase the total receipts and disbursements of the College, but only as there is a gain or loss in such commercial work is the cost of maintaining the College effected. If, as far as they balance each other, these receipts and disbursements be stricken out and we also omit the investment funds paid in and reloaned, and the receipts and expenditures on account of student funds, the statement will then show the income derived and the expenditures paid from:

1. The National fund for maintaining the College.
2. The National fund for maintaining the experiment station.
3. The appropriations by the State for buildings and repairs.

Putting the figures in this shape we would have:

(1) NATIONAL FUND FOR MAINTAINING THE COLLEGE.

INCOME.

For fiscal year, 1892—		
From endowment fund	$ 44,417.73	
From Morrill support fund	18,000.00	$ 62,417.73

For fiscal year, 1893—		
From endowment fund	$ 43,928.73	
From Morrill support fund	19,000.00	$ 62,928.73
Total		$ 125,346.46

EXPENDITURES.

For fiscal year, 1892—		
For salaries	$ 32,671.59	
For apparatus, assistants and current expenses of departments	37,555.86	$ 70,227.45
For fiscal year, 1893—		
For salaries	$ 34,221.96	
For apparatus, assistants and current expenses of departments	28,897.51	$ 63,119.47
Total for two years		$ 133,346.92

Thus showing that the expenditures for the maintenance of the College proper for the two years, exhausted the income for that period and lessened the balance on hand at the beginning thereof by the sum of $8,000.46, reducing the cash to the credit of this fund from $23,525.74 to $15,525.28.

(2) NATIONAL EXPERIMENT STATION FUND.

INCOME.

From national appropriation for 1892	$ 15,000.00
From national appropriation for 1893	15,000.00
Total	$ 30,000.00

EXPENDITURES.

For 1892, over and above income from sales	$ 15,019.31
For 1893, over and above income from sales	16,327.13
Total	$ 31,346.44

Making an excess of expenditures over income of $1,346.44, thus reducing the cash balance that was to the credit of the station at the beginning of the period from $1,821.12 to $474.68.

(3) STATE BUILDING AND REPAIR FUNDS.

RECEIPTS FROM APPROPRIATIONS.

Drawn from the state treasury during 1892		$ 39,989.33
Drawn from the state treasury during 1893	$ 31,163.80	
Deduct amount returned to treasury	744.42	
		30,419.38
Total		$ 70,408.71

EXPENDED.

During 1892		$ 40,936.12
During 1893	$ 31,222.98	
Less amount returned to treasury	744.42	
		30,478.56
Total		$ 71,414.68

The expenditures are thus seen to exceed the receipts by $1,005.97, wiping out a balance of that amount on hand at the beginning of the biennial period.

Summarizing the receipts and expenditures for the two years in these three different lines we have the following:

RECEIPTS AND EXPENDITURES FOR BIENNIAL PERIOD.

RECEIPTS.

From national support funds	$ 125,346.46
From national appropriations for experiment station	30,000.00
From state appropriations for buildings and repairs	70,408.71
Total	$ 225,755.17

EXPENDITURES.

For maintenance of College proper	$ 133,346.92
For maintenance of experiment station	31,346.44
For buildings and repairs	71,414.68
Total	$ 236,108.04

The excess of the expenditures over the receipts is $10,352.87, represented by a reduction in the cash balances to the credit of these various funds of that amount. Balances to the credit of student accounts, and College funds awaiting investment, were diminished during the same time by $1,732.17, showing a reduction in the total cash balance in the treasurer's hands of $12,085.04, or from $30,001.84, the amount reported at the close of the last biennial period, to $17,916.80, the amount now on hand.

This cash balance belongs to the following funds:

College support fund—		
Interest fund	$ 3,952.67	
Morrill fund	11,572.61	$ 15,525.28
Experiment station fund		474.68
Contingent principal fund awaiting investment		590.00

Student funds—		
Room rent	$ 199.69	
College hospital fund	26.91	
Diploma fund	707.26	$ 933.86
Right-of-way damages held in trust		88.00
Donation fund		4.98
Organ fund (from sale of old organ)		300.00
Total		$ 17,916.80

The usual settlements have been made with the treasurer as required by law. His accounts have been carefully examined, compared with those of the officers making remittances to him and with the duplicate receipts filed in my office. He has debited himself with all cash received, and produced proper vouchers for all cash paid out. The additions in his cash books have been tested, and the cash balance of $17,916.80 found to be correct.

INCOME FOR 1893–4.

After deducting from the total cash on hand the amounts to the credit of the experiment station, the repair fund and all accounts other than the support fund, there remains:

To the credit of the Morrill fund	$ 11,572.61
To the credit of the interest fund	3,952.61
Total	$ 15,525.22

The balance is about the same as the amount on hand at the beginning of the year, showing that the College has met its expenses from the current income. It should be remembered in considering this balance that the Morrill fund year does not end until June 30, 1894. The amount to the credit of that fund is no more than the share due to the unexpired portion of the year. The interest fund credit is, if anything, less than the usual working balance. Considering therefore that the available fund for the coming year will be about equal to the year's income I estimate it as follows:

From interest fund	$ 44,000.00
From Morrill fund	20,000.00
Total	$ 64,000.00

I omit in this estimate the $15,000.00 received annually from the National government on experiment station account since this entire sum is available only for the purpose of experimentation and not for the ordinary running expenses of the College.

Respectfully submitted,

E. W. STANTON,
Secretary.

EXHIBIT A.

The following statement shows the ordinary income of the College for the fiscal year ending November 9, 1892, together with the expenditures on account of the various departments; the experiment station not being included but reported elsewhere:

RECEIPTS.

Cash on hand November 12, 1891		$ 23,525.74
Rental on endowment fund land	$ 11,516.19	
Rental on land purchased with interest fund	1,084.75	
Interest on endowment fund invested in farm mortgages	26,954.35	
Interest on bonds held by State treasurer	330.00	
Rental on land obtained by the foreclosure of endowment fund mortgages	126.00	
Interest on interest fund invested in farm mortgages	4,406.44	44,417.73
Morrill support fund—installment for 1892		18,000.00
Total		$ 85,943 47

EXPENDITURES.

Salaries		$ 32,671.59
Agricultural department—		
Farm credit	$ 1,800.00	
Farm help	600.00	
Bridge	389.80	
Other permanent improvements	300.00	
Purchase of hogs and sheep	1,700.00	
Milk routes and good will of Ames Creamery Co.	500.00	
Creamery apparatus	5,476.83	
Creamery credit	299.65	
Creamery instruction	1,026.04	
Class illustration	112.70	12,205.02
Horticultural department—		
Current expenses and apparatus	$ 293.28	
Assistant	379.29	672.57

Civil engineering department—		
Current expenses and apparatus	$ 791.46	
Assistant	300.00	$ 1,091.46
Mechanical department		4,552.99
Botany department—		
Current expenses and apparatus	$ 848.47	
Assistants	250.00	1,098.47
Veterinary department—		
Current expenses and apparatus	$ 598.83	
Assistant	400.00	998.83
Chemistry department—		
Current expenses and apparatus	$ 698.93	
Assistant	600.00	1,298.93
Entomology and zoology department—		
Current expenses and apparatus	$ 1,199.79	
Assistant	553.27	1,753.06
Physics and electrical engineering—		
Current expenses and apparatus	$ 1,925.00	1,925.00
Military tactics and physical culture		295.70
Domestic economy department		348.87
Library—		
Books, periodicals and expenses	$ 2,481.00	
Assistant	75.00	2,556.00
Agricultural chemistry		100.00
Mathematical department—		
Assistant	$ 721.14	721.14
Department of music—		
Miss Chambers	$ 400.00	
Mr. Backus	100.00	
Programs and music	25.00	525.00
Public rooms—		
Main building	$ 159.61	
Morrill hall	831.40	
Office building	250.00	
North hall	174.02	
Chemical laboratory	142.46	
Morrill hall furniture	91.94	
Chairs	47.84	1,697.27

Public grounds		$ 1,212.06
Contingent expense		4,306.49
Sabbath services		197.00
Total		$ 70,227.45
Cash on hand—		
Morrill fund	$ 11,441.30	
Interest fund	4,274.72	
		15,716.02
Total		$ 85,943.47

EXHIBIT "B."

The following shows the ordinary income of the College for the fiscal year ending November 8, 1893, together with the expenditures on account of the various departments; the experiment station not being included, but reported elsewhere:

RECEIPTS.

Cash balance on hand November 9, 1892			$ 15,716 02
Rental on endowment fund land	$ 10,339.57		
Rental on land purchased with interest fund	759.36		
Interest on endowment fund invested in farm mortgages	26,789.93		
Interest on bonds held by State treasurer	330.00		
Rental on land obtained by the foreclosure of endowment fund mortgages	262.00		
Interest on interest fund invested in farm mortgages	5,447.87		
			43,928.73
Morrill support fund—installment for 1893			19,000.00
Total			$ 78,644.75

EXPENDITURES.

	Dr.	Cr.	Dr.
Salaries			$ 34,221.96
Department of agriculture—			
Farm credit	$ 1,182.89		
Permanent improvements	595.78		
Fencing motor track	379.81		
Class illustrations and expenses	204.56		
			2,363.04
Creamery—			
Creamery credit	$ 902.04		
Salary of Mr. McKay as instructor	300.00		
Dairy—apparatus and class expenses		.78	
State fair exhibit	22.53		
	$1,224.57	.78	1,223.79
Horticultural department—			
Current expenses		$569.14	
Veterinary department—			
House surgeon	$ 400.00		
Expenses and apparatus	489.05		
			889.05

Mechanical department—			
Assistants	$ 2,700.00		
Expenses and apparatus	1,886.53		
		$	4,586.53
Civil engineering—			
Assistant	$ 300.00		
Expenses and apparatus	754.90		
			1,054.90
Physics and electrical engineering—			
Assistant	$ 400.00		
Expenses and apparatus	1,623.40		
			2,023.40
Mining engineering—			
Current expenses			58.19
Department of chemistry—			
Assistants	$ 699.75		
Expenses and apparatus	583.24		
			1,282.99
Agricultural chemistry		$ 1.11	
Entomology and zoology—			
Assistant	$ 797.72		
Expenses and apparatus	764.38		
			1,562.10
Department of botany—			
Assistant	$ 250.00		
Expenses and apparatus	360.44		
			610.44
Department of mathematics and secretary's office—			
Assistants and clerk hire	$ 929.99		
Typewriter	128.86		
			1,058.85
Military tactics and physical culture			362.52
Domestic economy			297.17
Library—			
Assistant	$ 300.00		
Expenses, books and periodicals	2,411.00		
			2,711.00
Department of music—			
Salary of director	$ 400.00		
Instrumental music—public exercises	100.00		
Piano	302.00		
Current expenses	8.50		
			810.50
Public rooms—			
Main building	$ 40.39		
Morrill hall	802.21		
Office building	563.79		
Furniture for main building	170.27		
Furniture for office	652.50		
Furniture for college chapel	90.21		
Stoves for college hospital	39.50		
			2,358.87

Public grounds			$ 1,756.89
Contingent expense			4,035.98
Chapel services			421.55
Less horticultural department, Cr	$ 569.14		$ 63,689.72
Less agricultural chemistry, Cr	1.11		
			570.25
Total net ordinary expenses			$ 63,119.47
Cash on hand—			
Morrill fund	$ 11,572.61		
Interest fund	3,952.67		
			15,525.28
Total			$ 78,644.75

EXHIBIT "C."

The following statement shows for the fiscal year ending November 8, 1893:

1. Total expenditures of each department.
2. Total income of each department.
3. Total amount of interest fund expended by each department.
4. Appropriation by the Board to each department.

ACCOUNT.	Total expended.	Total income sales.	Amount of appropriation expended.	Amount of appropriation.
Salaries	$ 34,221.96	$	$ 34,221.96	$ 34,221.96
Department of agriculture—				
Farm credit	8,940.07	7,757.18	1,182.89	1,400.00
Permanent improvements	595.78		595.78	600.00
Fencing motor track	379.81		379.81	379.81
Class illustration and expenses	204.56		204.56	215.00
Creamery—				
Creamery credit	22,276.91	21,374.87	902.04	1,400.00
Salary of M. T. McKay as instructor	300.00		300.00	300.00
Dairy apparatus and class expenses	218.27	219.05		
State fair exhibit	22.53		22.53	25.00
Department of horticulture—				
Current expenses	3,974.73	4,543.87		990.00
Veterinary department—				
House surgeon	400.00		400.00	400.00
Expenses and apparatus	997.11	508.08	489.05	540.00
Mechanical department—				
Assistants	2,700.00		2,700.00	2,700.00
Expenses and apparatus	5,024.42	3,137.89	1,886.53	1,920.00
Civil engineering—				
Assistant	300.00		300.00	300.00
Expenses and apparatus	756.10	1.20	754.90	755.00
Physics and electrical engineering—				
Assistants	400.00		400.00	400.00
Expenses and apparatus	2,128.35	504.95	1,623.40	1,630.00
Mining engineering—				
Current expenses	58.19		58.19	200.00
Department of chemistry—				
Assistants	699.75		699.75	700.00
Expenses and apparatus	1,845.26	1,262.02	583.24	720.00
Agricultural chemistry	1.60	2.71		
Entomology and zoology—				
Assistant	797.72		797.72	800.00
Expenses and apparatus	949.89	185.51	764.38	795.00
Department of botany—				
Assistant	250.00		250.00	250.00
Expenses and apparatus	472.34	111.90	360.44	363.00
Dep't of mathematics and secy's office—				
Assistants and clerk hire	929.99		929.99	1,500.00
Type writer	128.88		128.86	135.00
Military tactics and physical culture	362.52		362.52	370.00
Domestic economy	409.17	112.00	297.17	300.00

EXHIBIT "C."—CONTINUED.

ACCOUNT.	Total expended.	Total income sales.	Amount of appropriation expended.	Amount of appropriation.
Library—				
Assistant	300.00		300.00	300.00
Current expenses, books and periodicals	2,416.69	5.69	2,411.00	2,713.79
Department of music—				
Salary of director	400.00		400.00	400.00
Instrumental music for public exercises	100.00		100.00	100.00
Piano	302.00		302.00	302.00
Current expenses	8.50		8.50	25.00
Public rooms—				
Main building	40.39		40.39	40.39
Morrill hall	802.21		802.21	802.21
Office building	563.79		563.79	563.79
Furniture for main building	170.27		170.27	170.27
Furniture for office	652.50		652.50	652.50
Furniture for college chapel	90.21		90.21	100.00
Stoves for college hospital	39.50		39.50	125.00
Public grounds	1,756.89		1,756.89	1,887.94
Contingent expenses	4,035.98		4,035.98	4,500.79
Chapel services	421.55		421.55	450.00
Total	$ 102,846.37	$ 39,726.90	$ 63,090.50	$ 67,413.45
Less horticultural department, Cr.	$ 569.14			
Less agricultural chemistry, Cr.	1.11			
Less dairy department, Cr.	.78		$ 571.03	
Total			$ 64,119.47	

TREASURER'S REPORT.

The following is a complete statement of the transactions in all the accounts for the fiscal year ending November 9, 1892.

	BALANCES, NOVEMBER 9, 1891.		FISCAL YEAR.		TOTALS.		INTEREST FUND.		BALANCES, NOVEMBER 9, 1892.	
			Expenditures.	Receipts.						
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Interest on lands belonging to Congressional grant	$	$ 7,734.61	$	$ 11,515.19	$	$ 19,250.80	$	$ 19,250.80	$	$ .....
Interest on accumulated interest	.....	.....	.....	5,491.19	.....	5,491.19	.....	5,491.19	.....	.....
Endowment interest fund, foreclosures	.....	.....	.....	126.00	.....	126.00	.....	126.00	.....	.....
Endowment interest fund	.....	.....	.....	27,284.35	.....	27,284.35	.....	27,284.35	.....	.....
Contingent principal fund	.....	75,320.00	.....	3,200.00	.....	78,520.00	.....	.....	.....	78,520.00
Mortages receivable	74,315.00	.....	6,100.00	2,565.00	80,415.00	2,565.00	.....	.....	77,850.00	.....
Donation fund	.....	18.08	.....	3.20	.....	21.28	.....	.....	.....	21.28
Diploma fund	.....	231.30	203.25	200.00	203.25	431.30	.....	.....	.....	228.05
Room rent	.....	1,585.69	3,299 94	2,302.00	3,299.94	3,887.69	.....	.....	.....	587.75
College hospital fund	.....	244.94	598.11	609.00	598.11	853.94	.....	.....	.....	255.83
Railroad damages	.....	264.00	176.00	.....	176.00	264.00	.....	.....	.....	88.00
Personal accounts	476.95	.....	.....	.....	476.95	.....	.....	.....	476.95	.....
Bills receivable	577.25	.....	.....	.....	577.25	.....	.....	.....	577.25	.....
Organ	.....	300.00	.....	.....	.....	300.00	.....	.....	.....	300.00
Salaries	.....	.....	11,993.01	.....	11,993.01	.....	11,993.01	.....	.....	.....
Morrill support fund	.....	16,845.33	23,404.03	18,000.00	23,404 03	34,845.33	.....	.....	.....	11,441.30
Farm department, general account	.....	.....	10,328.08	5,928.08	10,328.08	5,928 08	4,400.00	.....	.....	.....
Farm department, creamery, etc	.....	.....	25,381.27	18,602.29	25,381.27	18,602.29	6,778.98	.....	.....	.....
Horticultural department	.....	.....	3,939.10	3,266.53	3,939.10	3,266.53	672.57	.....	.....	.....
Chemical department	.....	.....	2,174.29	1,175.36	2,174.29	1,175.36	998.93	.....	.....	.....
Civil engineering department	.....	.....	1,102.96	11.50	1,102.96	11.50	1,091.46	.....	.....	.....
Zoology and entomology	.....	.....	1,448.80	249.01	1,448.80	249.01	1,199.79	.....	.....	.....
Mechanical department	.....	.....	6,738.13	2,185.14	6,738 13	2,185.14	4,552.99	.....	.....	.....
Department of physics	.....	.....	2,009.97	84.97	2,009.97	84.97	1,925 00	.....	.....	.....
Veterinary department	.....	.....	1,611.30	612.47	1,611.30	612.47	998.83	.....	.....	.....
Botanical department	.....	.....	1,051.51	78.04	1,051 51	78.04	973.47	.....	.....	.....
Department of music	.....	.....	525.00	.....	525.00	.....	525.00	.....	.....	.....
Public rooms	.....	.....	1,720.02	22.75	1,720 02	22.75	1,697.27	.....	.....	.....
Contingent expense	.....	.....	4,306.49	.....	4,306.49	.....	4,306.49	.....	.....	.....
Library	.....	.....	2,567.68	11.68	2,567.68	11.68	2,556.00	.....	.....	.....
Domestic economy	.....	.....	348.87	.....	348.87	.....	348.87	.....	.....	.....

Military department	.....	.....	327.20	31.50	327.20	31.50	295.70	.....	.....	.....
Agricultural chemistry	.....	.....	100.00	.....	100.00	.....	100.00	.....	.....	.....
Public grounds	.....	.....	1,218.34	6.28	1,218 34	6.28	1,212.06	.....	.....	.....
Chapel services	.....	.....	197.00	.....	197.00	.....	197.00	.....	.....	.....
State appropriations	.....	1,005.97	40,936.12	39,989.33	40,936.12	40,995.30	.....	.....	.....	59.18
Experiment station	.....	1,821.12	9,604.48	7,783.36	9,604.48	9,604.48	.....	.....	.....	.....
Experiment station	.....	.....	7,456.55	9,258.36	7,456.55	9,258.36	.....	.....	.....	1,801.81
Balance interest fund on hand	$ 75,369.20	$ 105,371.04	$ 170,867.50	$ 160,593.58	$ 246,236.70	$ 265,964.62	$ 46,823.42	$ 52,152.34	.....	.....
	.....	.....	.....	.....	.....	.....	5,328.92	.....	.....	5,328.92
Cash to balance—										
State appropriations	1,005.97	.....	.....	946.79	59.18	.....	.....	.....	59.18	.....
Experiment station	1,821.12	.....	.....	19.31	1,801.81	.....	.....	.....	1,801.81	.....
Morrill fund	16,845.33	.....	.....	5,404.03	11,441.30	.....	.....	.....	11,441.30	.....
Other sources	10,329.42	.....	.....	3,963.79	6,425.63	.....	.....	.....	6,425.63	.....
Total	$ 105,371.04	$ 105,371.04	$ 170,867.50	$ 170,867.50	$ 265,964.62	$ 265,964.62	$ 52,152.34	$ 52,152.34	$ 98,632.12	$ 98,632.12

STATE APPROPRIATIONS.

The following is a statement of the different appropriations for the fiscal year ending November 9, 1892.

	Balance November 11, 1891.	Drawn from State treasurer.	Expended.	Balance November 9, 1892.
State repair and improvement fund of 1890-1891	$ 408.72	$ 100.00	$ 508.72	$ .....
State repair and improvement fund of 1892	.....	1,000.00	999.68	.32
State contingent fund of 1890-1891	41.30	652.73	694.03	.....
State contingent fund of 1892	.....	996.19	996.19	.....
State experimental fund of 1889, 1890 and 1891	555.95	2,600.84	3,156.79	.....
State experimental fund of 1892	.....	1,500.00	1,464.59	35.41
Boiler and engine house	.....	1,840.37	1,840.37	.....
Repairs on college buildings and boarding halls	.....	2,516.43	2,516.43	.....
Repairs and improvements of farm buildings	.....	702.29	702.29	.....
Fire escapes	.....	107.85	107.85	.....
Water supply	.....	153.00	153.00	.....
Creamery and farm barns	.....	5,000.00	5,000.60	.....
Agricultural hall	.....	13,505.64	13,505.64	.....
Steam heating and electric lights	.....	831.45	831.45	.....
General repair and improvement fund	.....	8,482.54	8,459.09	23.45
Total	$ 1,005.97	$ 39,989.33	$ 40,936.12	$ 59.18

TREASURER'S REPORT.

The following is a complete statement of the transactions in all the accounts for the fiscal year ending November 8, 1893.

	BALANCE, NOVEMBER, 1892.		FISCAL YEAR.				TOTALS.		MORRILL FUND.		INTEREST FUND.		BALANCE, NOVEMBER 8, 1893.	
			Expenditures.		Receipts.									
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Interest on lands belonging to Congressional grant	$	$ 5,028.87	$	.....	$ 10,339.57	.....	$	$ 15,968.14	$	$	$	$ 15,968.14	$	$ .....
Interest on accumulated interest	.....	.....	.....	6,297.23	.....	6,297.23	.....	6,297.23	.....	.....	.....	6,297.23	.....	.....
Endowment interest, foreclosure	.....	.....	.....	282.00	.....	282.00	.....	282.00	.....	.....	.....	282.00	.....	.....
Endowment interest fund	.....	.....	.....	27,119.93	.....	27,119.93	.....	27,119.93	.....	.....	.....	27,119.93	.....	.....
Contingent principal fund	78,530.00	.....	.....	2,530.00	.....	81,060.00	.....	81,060.00	.....	.....	.....	.....	.....	81,060.00
Mortgages receivable	77,850.00	.....	10,500.00	7,700.00	88,150.00	7,700.00	.....	7,700.00	.....	.....	80,450.00	.....	80,450.00	.....
Donation fund	.....	21.98	19.50	3.20	19.50	24.48	.....	.....	.....	.....	.....	.....	4.98	.....
Diploma fund	.....	228.05	140.79	820.00	140.79	857.05	.....	.....	.....	.....	.....	.....	707.26	.....
Room rent	.....	887.75	2,056.18	2,568.12	2,056.18	3,455.87	.....	.....	.....	.....	.....	.....	199.69	.....
College hospital	.....	255.83	987.42	738.50	987.42	1,014.33	.....	.....	.....	.....	.....	.....	26.91	.....
Railroad damages	.....	88.00	.....	.....	.....	88.00	.....	.....	.....	.....	.....	.....	88.00	.....
Personal accounts	476.95	.....	.....	.....	476.95	.....	.....	.....	.....	.....	.....	.....	476.95	.....
Bills receivable	577.25	.....	.....	.....	577.25	.....	.....	.....	.....	.....	.....	.....	577.25	.....
Organ	.....	300.00	.....	.....	.....	300.00	.....	300.00	.....	.....	.....	.....	.....	300.00
Salaries, interest	.....	.....	15,353.97	.....	15,353.97	.....	.....	.....	.....	.....	15,353.97	.....	.....	.....
Salaries, Morrill support fund	.....	11,441.30	18,868.69	19,000.00	18,868.69	20,441.30	18,868.69	20,441.30	.....	.....	1,223.44	.....	.....	.....
Creamery	299.65	.....	22,517.71	21,593.92	22,817.36	21,593.92	.....	.....	.....	.....	2,663.04	.....	.....	.....
Farm	.....	.....	10,420.22	7,757.18	10,420.22	7,757.18	.....	.....	.....	.....	.....	.....	.....	.....
Horticulture	.....	.....	3,974.73	4,543.87	3,974.73	4,543.87	.....	.....	.....	.....	.....	.....	.....	.....
Chemistry	.....	.....	2,545.01	1,392.02	2,545.01	1,392.02	.....	.....	.....	.....	.....	.....	.....	.....
Civil engineering	.....	.....	1,056.10	1.20	1,056.10	1.20	.....	.....	.....	.....	.....	.....	.....	.....
Zoology and entomology	.....	.....	1,747.61	185.51	1,747.61	185.51	.....	.....	.....	.....	1,582.10	.....	.....	.....
Mechanical engineering	.....	.....	7,724.42	3,137.89	7,724.42	3,137.89	.....	.....	.....	.....	4,586.53	.....	.....	.....
Physical	.....	.....	2,528.35	504.95	2,528.35	504.95	.....	.....	.....	.....	2,023.40	.....	.....	.....
Veterinary	.....	.....	1,397.11	508.06	1,397.11	508.06	.....	.....	.....	.....	889.05	.....	.....	.....
Botany	.....	.....	722.24	111.80	722.24	111.80	.....	.....	.....	.....	610.44	.....	.....	.....
Music	.....	.....	810.50	.....	810.50	.....	.....	.....	.....	.....	810.50	.....	.....	.....
Public rooms	.....	.....	2,358.87	.....	2,358.87	.....	.....	.....	.....	.....	2,358.87	.....	.....	.....
Contingent expense	.....	.....	4,035.98	.....	4,035.98	.....	.....	.....	.....	.....	4,035.98	.....	.....	.....

TREASURERS' REPORT—CONTINUED.

	BALANCE, NOVEMBER, 1892.		FISCAL YEAR. Expenditures.	FISCAL YEAR. Receipts.	TOTALS.		MORRILL FUND.		INTEREST FUND.		BALANCE, NOVEMBER 8, 1893.	
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Library			2,716.69	5.69	2,716.69	5.69			2,711.00			
Domestic economy			409.17	112 00	409.17	112.00			297.17			
Mathematics			1,058.85		1,058.85				1,058.85			
Military			362.52		362.52				362.52			
Mining engineering			58.19		58.19				58.19			
Agricultural chemistry			1.60	2.71	1.60	2.71				1.11		
Public grounds			1,756.89		1,756.89				1,756.89			
Sabbath services			421.55		421.55				421.55			
State appropriations		59.18	31,222.98	31,163.80	31,222.98	31,222.98						
Experiment station, 1892-93		1,801.81	11,374.41	9,572.60	11,374.41	11,374.41						
Experiment station			7,161.51	7,636.19	7,161.51	7,636.19						474.68
	$ 79,203.85	$ 98,931.77	$ 167,018.16	$ 165,207.04	$ 246,222.01	$ 264,138.81	$ 18,868.69	$ 30,441.30	$ 45,120.68	$ 50,127.55	$ 81,504.20	$ 82,841 52
Balance interest fund on hand									5,006.87			5,006.87
Balance Morrill fund on hand							11,572.61					11,572.61
Cash to balance—												
Experiment station	1,801.81			1,327.13	474.68						474.68	
Morrill fund	11,441.30		131.31		11,572.61						11,572.61	
Other sources	6,425.63			556.12	5,869.51						5,869.51	
State appropriations	59.18			59.18								
Totals	$ 98,931.77	$ 98,931.77	$ 167,149.47	$ 167,149.47	$ 264,138.81	$ 264,138.81	$ 30,441.30	$ 30,441.30	$ 50,127.55	$ 50,127.55	$ 99,421.00	$ 99,421.00

TREASURER'S REPORT—STEWARD'S DIVISION.

	BALANCE, NOVEMBER 9, 1892.		FISCAL YEAR. Expenditures.	FISCAL YEAR. Receipts.	TOTALS.		BALANCES NOV. 8, 1893.	
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Boarding account	$	$ 985.68	$ 30,474.50	$ 29,479.55	$ 30,474.50	$ 30,475.23	$	$ .67
Fires, lights and incidentals		336.44	14,255 80	13,936 04	14,255.80	14,262.48		6.68
Damages			439.10	441.61	439.10	441.61		2.51
Cash to balance	$ 1,322.12	$ 1,322.12	$ 45,169.40	$ 43,857.20	$ 45,169.40	$ 45,169.32	$ 9.80	$ 9.80
	1,322.12			1,312.30	9.80		9.80	
Totals	$ 1,322.12	$ 1,322.12	$ 45,159.40	$ 45,159.40	$ 45,169.32	$ 45,169.32	$ 9.80	$ 9.80

STATE APPROPRIATIONS.

The following is a statement of the different appropriations for the fiscal year ending November 8, 1893.

	Balance, November 9, 1892.	Drawn from State treasurer.	Expended during fiscal year	Balance, November 8, 1893.
State repair and improvement fund, 1892-1893	$	$ 1,000 00	$ 1,000 32	$ .32
State contingent fund, 1892-1893		453.85	453.85	
State experimental fund, 1892	35.41		35.41	
State experimental fund of 1893		1,560.00	1,560.00	
Repair and improvement of farm buildings		4.76	4.76	
Water supply		995.91	995.91	
Agricultural hall		21,353.27	21,353.27	
Steam heating		2,168.55	2,168.55	
General repairs	353.45	4,017.46	4,040.01	*
Totals	$ 59.18	$ 31,165.80	$ 31,222.98	

*Balance of $744.42 returned to State treasurer.

FINANCIAL STATEMENT.

THE IOWA AGRICULTURAL COLLEGE EXPERIMENT STATION *in account with the* UNITED STATES APPROPRIATION.

1891-2. RECEIPTS.

Amount received from United States treasurer, as per appropriation for the year ending June 30, 1892, under act of Congress, approved March 2, 1887	$ 15,000.00
Amount received from the sale of stock and produce belonging to the station	375.50
Total receipts	$ 15,375.50

1891-92. EXPENDITURES.

Paid for buildings—		
On the improvement and repair of station buildings	$ 244.34	
On the erection of an experimental creamery	489.17	
		$ 733.51
Paid for salaries—		
Director	$ 1,145.76	
Assistant director	1,558.26	
Chemist	916.63	
Horticulturist	275.00	
Entomologist	275.00	
Botanist	275.00	
Assistant veterinarian	458.26	
Treasurer	229.13	
Assistants in all sections	1,305.39	
		6,438.43
Paid for labor—		
General field, office and laboratory work		2,147.50
Paid for apparatus and library—		
Books, periodicals and binding	$ 212.88	
Apparatus for laboratories	498.34	
		711.22
Paid for equipment—		
Tools	$ 72.81	
Thoroughbred sheep	623.75	
Cattle for experiments	568.00	
		1,264.56

Paid for supplies and expenses—			
Traveling expenses of director	$ 38.75		
Traveling expenses of assistant director	23.27		
Traveling expenses of chemist	78.69		
Traveling expenses of botanist	78.24		
Traveling expenses of veterinarian	36.78		
Traveling expenses of professor of agriculture	19.52		
Carrying the mail	52.51		
Feed for stock	250.35		
Seeds and plants	174.58		
Supplies for laboratories	155.49		
Fencing	84.95		
Supplies for field experiments	189.96		
Supplies for offices	265.45		
Expenses for offices	227.60		
Coal and gasoline	363 28		
Freight and express	410.01		
		$ 2,229.43	
Paid for bulletins—			
Printing	$ 1,612.50		
Cuts for same	105.85		
Envelopes	132.50		
		1,850.85	
Totals		$ 15,375.50	375.50

THE IOWA AGRICULTURAL COLLEGE EXPERIMENT STATION *in Account with* THE UNITED STATES APPROPRIATION.

RECEIPTS.

1892-3.	
Amount received from the United States Treasurer as per appropriation for the year ending June 30, 1893, under Act of Congress approved March 2, 1887	$ 15,000.00
Amount received from the sale of stock and produce belonging to the station	3,830.96
Total receipts	$ 18,830 96

EXPENDITURES.

Paid for buildings—		
On the repair and improvement of station buildings	$ 59.90	
On the erection of an experimental creamery	690.10	$ 750.00

Paid for salaries—			
Director	$ 1,354.08		
Assistant director	1,841.58		
Chemist	1,016.61		
Horticulturist	458.32		
Entomologist	375.00		
Botanist	425.00		
Assistant veterinarian	541.58		
Treasurer	270.79		
Assistant agriculturist in dairying	283.32		
Assistant horticulturist	433.29		
Assistant chemist	719.58		
Assistant botanist	225.81		
Assistant entomologist	433.29	$ 8,378.25	
Paid for labor—			
General field, office and laboratory work		2,287.95	
Paid for apparatus and library—			
Books and apparatus		688.38	
Paid for equipment—			
Tools	$ 195.58		
Stock for experiments	788.40	983.98	
Paid for supplies and expenses—			
Traveling expenses of assistant director	$ 48.50		
Traveling expenses of assistant veterinarian	34.64		
Supplies for experiments	688.73		
Carrying mail	29.16		
Feed for stock	1,632.27		
Seeds and plants	81.43		
Expenses of experiments	335.22		
Office expenses	378.80		
Telephone rental	40.00		
Coal and gasoline	431.65		
Freight	133.46		
Express	59.49	3,893.35	
Paid for bulletins—			
Printing same	$ 1,739.05		
Envelopes	110.00	1,849.05	
Totals		$ 18,850 96	$ 18,830.96

It should be noted that the foregoing statement of the receipts and expenditures of the experiment station for the two years ending June 30, 1893, covers the fiscal years of the national government, and that these do not correspond with those of the College. This fact renders, of course, any comparison of the amounts in this statement with those in the reports of the treasurer and secretary impracticable.

MORRILL FUND.

The following is a summary of the report made to the Secretary of the Interior for the year ending June 30, 1892:

July 1, 1891—balance on hand	$ 18,294.03
October 2, 1891—received from State treasurer	17,000.00
Total	$ 35,294.03

EXPENDITURES.

Paid for agriculture—			
Instruction	$ 7,606.60		
Apparatus	124.27		
Machinery	187.50		
Text-books and reference books	40.46		
Stock and material	1,783.80	$ 9,742.63	
Paid for mechanic arts—			
Instruction	$ 4,971.01		
Apparatus	1,078.13		
Machinery	423.70		
Text-books and reference books	27.50		
Stock and material	108.44	6,608.78	
Paid for the English language—			
Instruction	$ 145.54	145.54	
Paid for mathematical science—			
Instruction	$ 1,444.44	1,444.44	
Paid for physical science—			
Instruction	$ 1,699.98		
Apparatus	3,086.96		
Text-books and reference books	2.00		
Stock and material	5.00	4,793.94	
Paid for natural science—			
Instruction	$ 5,860.67		
Apparatus	1,715.91		
Text-books and reference books	73.06	7,649.64	

Paid for economic science—		
Instruction	$ 488.87	
Text-books and reference books	17.66	
	506.53	
Total expended	$ 30,891.50	
Balance cash on hand June 30, 1892	4,402 53	
Totals	$ 35,294.03	$ 35,294.03

MORRILL FUND.

The following is a summary of the report made to the Secretary of the Interior for the year ending June 30, 1893:

RECEIPTS.

July 1, 1892. Balance on hand	$ 4,402.53
August 27, 1892. Received from State Treasurer	18,000.00
Total	$ 22,402.53

EXPENDITURES.

Paid for agricultural instruction	$ 7,635.97	
Paid for mechanic arts instruction	4,168.29	
Paid for mathematical science instruction	1,466.64	
Paid for physicial science instruction	1,999.92	
Paid for natural science instruction	5,865.66	
Paid for economic science instruction	533.32	
Total	$ 21,669.80	
Balance of cash on hand June 30, 1893	732.73	
Total	$ 22,402.53	$ 22,402.53

Respectfully submitted,

HERMAN KNAPP,
Treasurer.

REPORT OF LAND AGENT.

1891-2.

To the Board of Trustees of the Iowa State Agricultural College and Farm:

The following report of the transactions of the Land Department of the Iowa State Agricultural College, from November 1, 1891, to October 31, 1892, inclusive, is hereby submitted.

COLLECTIONS.

Interest, or rent on lands belonging to the congressional grant	$ 11,516.19	
Interest or rent on land purchased with accumulated interest	1,084.75	
Interest on loans made from accumulated interest	4,406.44	
Total income collected during fiscal year	$ 17,007.38	$ 17,007.38
Sale of lands belonging to congressional grant	$ 31,977.70	
Sale of lands purchased with accumulated interest	3,200.00	
Principal on loans made from accumulated interest	2,565.00	
Total principal collected during fiscal year	$ 37,742.70	37,742.70
Total collections for fiscal year		$ 54,750 08

DISBURSEMENTS.

Paid College treasurer as follows:		
Interest or rent on lands belonging to congressional grant	$ 11,516.19	
Interest or rent on lands purchased with accumulated interest	1,084.75	
Interest on loans made from accumulated interest	4,406.44	
Principal on loans made from accumulated interest	2,565.00	
Total paid College treasurer for fiscal year	$ 19,572 38	$ 19,572.38
Remitted State treasurer as follows:		
Sale of lands belonging to congressional grant	$ 31,977.70	
Sale of lands purchased with accumulated interest	3,200.00	
Total remitted State treasurer for fiscal year	$ 35,177.70	35,177.70
Total disbursements for fiscal year		$ 54,750.08

LOANS.

There has been loaned of the contingent fund principal since the date of last report, $61,000.00, at seven per cent, secured on improved farming land, as follows:

Loan No. 103, Thomas Mortenson and Martin Mortenson	$ 2,000 00	
Loan No. 104, John C. Peterson	2,000.00	
Loan No. 105, Olaf L. Olson	1,500.00	
Loan No. 106, George Larson	600 00	
Total loaned from November 1, 1891, to October 31, 1892, inclusive		$ 6,100.00
Amount of loans outstanding November 1, 1892		74,315.00
Total		$ 80,415.00
Amount of principal paid from November 1, 1891, to October 31, 1892, inclusive		2,565.00
Total of loans outstanding		$ 77,850.00
Number of acres of congressional grant patented since last report	8,631.68	
Valuation of same		* 32,153.70
Number of acres of land purchased with accumulated interest fund, patented since last report	1,120.00	
Valuation of same		3,200.00

Respectfully submitted,

HERMAN KNAPP,
Land Agent.

*This amount exceeds the amount collected for the sale of lands belonging to the congressional grant by $176.00, which had already been collected by the College as "right of way damages across some of the lands."

REPORT OF LAND AGENT.

1892–3.

To the Board of Trustees of the Iowa State Agricultural College and Farm:

The following report of the transactions of the Land Department of the Iowa State Agricultural College, from November 1, 1892, to October 31, 1893, inclusive, is hereby submitted.

COLLECTIONS.

Interest or rent on lands belonging to the congressional grant	$ 10,339.57	
Interest or rent on land purchased, with accumulated interest	759.36	
Interest or rent on land obtained by foreclosure of loans made from endowment fund	126 00	
Interest on loans made from accumulated interest	5,447.87	
Total income collected during fiscal year	$ 16,672.80	$ 16,672.80
Sale of lands belonging to congressional grant	20,346.30	
Sale of land purchased with accumulated interest	2,520.00	
Principal on loans made from accumulated interest	7,700.00	
Total principal collected during fiscal year	$ 30,566.30	30,566.30
Total collections for fiscal year		$ 47,239.10

DISBURSEMENTS.

Paid College treasurer as follows:		
Interest or rent on lands belonging to congressional grant	$ 10,339.57	
Interest or rent on lands purchased with accumulated interest	759.36	
Interest or rent on land obtained by foreclosure of loan made from endowment fund	126.00	
Interest on loans made from accumulated interest	5,447.87	
Principal on loans made from accumulated interest	7,700 00	
Total paid College treasurer for fiscal year	$ 24,372.80	24,372.80
Remitted State treasurer as follows:		
Sale of lands belonging to congressional grant	$ 20,346 30	
Sale of lands purchased with accumulated interest	2,520.00	
Total remitted State treasurer for fiscal year	$ 22,866 30	22,866 30
Total disbursements for fiscal year		$ 47,239.10

LOANS.

There has been loaned of the contingent fund principal since date of last report, $10,300.00 at seven per cent, secured on improved farming land, as follows:

Loan No. 107, Betsey Brokke	$ 1,000.00	
Loan No. 108, John Green	600.00	
Loan No. 109, Ole P. Husted	800.00	
Loan No. 110, Thomas Larson	1,600.00	
Loan No. 111, W. E. Holmes	1,600.00	
Loan No. 112, George Olsen	1,800.00	
Loan No. 113, H. B. Baughman	900.00	
Loan No. 114, E. F. Melchor	2,000.00	
Total loaned from November 1, 1892, to October 31, 1893, inclusive	$ 10,300.00	$ 10,300.00
Amount of loans outstanding November 1, 1892		77,850.00
Total		$ 88,150.00
Amount of principal paid from November 1, 1892, to October 31, 1893, inclusive		7,700.00
Total of loans outstanding		$ 80,450.00
Number of acres of congressional grant patented since last report	6,298.29	
Valuation of same		20,346.30
Number of acres of land purchased with accumulated interest fund, patented since last report	840.00	
Valuation of same		2,520.00

The following is a description of the land belonging to the congressional grant, which is not under lease:

PARTS OF SECTION.	Section.	Township.	Range.	No. of acres.
ne ¼ of se ¼ and s ½ of se ¼	21	99	59	120.00
se ¼	28	99	48	160.00

Respectfully submitted,

HERMAN KNAPP,
Land Agent.

PROCEEDINGS
OF
BOARD OF TRUSTEES.

ABSTRACT OF THE PROCEEDINGS OF THE BOARD OF TRUSTEES, 1892-93.

MEMBERS OF THE BOARD.

	Term Expires.
First District—Hon. Hamilton Smith, Fairfield	1898
Second District—Hon. C. M. Dunbar, Maquoketa	1898
Third District—Hon. J. S. Jones, Manchester	1896
Fourth District—Hon. Addis Schermerhorn, Charles City	1898
Fifth District—Hon. Cato Sells, Vinton	1894
Sixth District—Hon. W. O. McElroy, Newton	1896
Seventh District—Hon. C. F. Saylor, Des Moines	1894
Eighth District—Hon. A. B. Shaw, Corning	1898
Ninth District—Hon. J. H. Wood, Atlantic	1896
Tenth District—Hon. Eugene Secor, Forest City	1894
Eleventh District—Hon. C. D. Boardman, Odebolt	1894

OFFICERS OF THE BOARD.

Hon. J. H. Wood, Atlantic	*Chairman*
E. W. Stanton, Ames	*Secretary*
Herman Knapp, Ames	*Treasurer*
W. A. Helsell, Odebolt	*Financial Agent*
C. V. Anderson, Ames	*Steward*

COMMITTEES OF THE BOARD.

Finance Committee—Trustees Dunbar, Saylor, Boardman, McElroy and Smith.

Committee on Faculty and Courses of Study—Trustees Wood, Secor, Jones, Shaw and Sells.

Committee on Agriculture, Horticulture, Experiment Station and Veterinary Science—Trustees Boardman, Dunbar, Jones, Smith and Schermerhorn.

Committee on Engineering Departments and Physics—Trustees McElroy, Secor and Shaw.

Committee on College Lands and Investments—Trustees Secor, Jones and Schermerhorn.
Building Committee—Trustees Saylor, Boardman and Dunbar.
Committee on Literary Departments and Library—Trustees Sells, Boardman and Wood.
Committee on Rules—Trustees Shaw, Sells and Wood.
Committee on Bonds—Trustees Smith, Saylor and McElroy.
Committee on Steward's Department, Domestic Economy, College Hospital and Sanitary Arrangements—Trustees Jones, Secor, Sells, Boardman and Shaw.
Committee on Scientific Departments—Trustees Schermerhorn, McElroy and Smith.
Public Grounds and Railroad—Trustees Schermerhorn, Dunbar and Wood.

MEMBERSHIP OF THE BOARD.

During the biennial period the following changes have taken place in the membership of the board: The terms of office of Hon. J. W. Garner, of the first district, Hon. C. M. Dunbar, of the second district, Hon. S. P. Yeomans, of the fourth district, Hon. Cato Sells, of the fifth district, and Hon. Geo. Van Houten, of the eighth district, expired May 1, 1892. Hon. Hamilton Smith, of Fairfield, Hon. Addis Schermerhorn, of Charles City, and Hon. A. B. Shaw, of Corning, were chosen to represent the first, fourth and eighth districts, respectively. Hon. C. M. Dunbar, of the second district, was re-elected, as was also Hon. Cato Sells, of the fifth, the latter to complete the unexpired term of Hon. Joseph Dysart, ending May 1, 1894. Members to represent the fifth, seventh, tenth and eleventh districts for the term beginning May 1, 1894, are to be chosen by the Twenty-fifth General Assembly.

STATE APPROPRIATIONS.

At the beginning of the biennial period the following balances of the appropriations of the State to the College remained unexpended:

For repairs on main College building and two boarding halls	$ 2,516.43
For fire escapes, additional water tank in main building, hose and other appliances for protecting College building against fire	107.85
For boiler, boiler and engine house, and steam heating apparatus for engineering hall	1,840 37
For repair and improvement of farm buildings, including the erection of swine house and corn cribs	707.05
Annual repair and improvement funds for 1891	1,202.75
Annual fund of $1,500, for experimentation in agriculture and horticulture (which had been allowed to accumulate with the idea of building a green house, but which was afterwards used for the erection of an experimental creamery)	3,156.79
Total	$ 9,531.24

Of this amount $8,525.27 had not been drawn from the State treasury, while $1,005.97 was in the hands of the College treasurer. The above balances were expended under the direction of the building committee, all bills being approved by its chairman. An analysis of the vouchers covering these expenditures shows that the appropriations were used for the following specific purposes:

1.	Appropriation for repairs on main College building and boarding cottages—		
	Addition to and changes in water closet system	$ 387.28	
	Repairing gutters	482.49	
	Painting exterior of main building	600.00	
	Putting in new floors, painting rooms, repairing roof, minor repairs, and expense of heating building while repairs were being made	1,046 66	
			$2,516.43
2.	Appropriation for fire escapes, additional water tank in main building, hose and other appliances for protecting college building against fire—		
	Material used in completing main fire escapes	$ 22.35	
	Part payment for elevator running from basement to fifth story, so arranged as to in part serve the purpose of a fire escape	85.50	
			$ 107.85
3.	Appropriation for boiler, boiler and engine house, and steam heating apparatus for engineering hall—		
	One-half cost of boiler (the other half charged to appropriation afterwards obtained for the repair and extension of the electric light plant)	$ 523.60	
	Freight on boiler	121.60	
	Setting boiler and putting brick floor in boiler room	275.70	
	Line shafting piers and cement floor for engine room	310 00	
	Line shafting	113.00	
	Foundation for, and setting Corliss engine	71.45	
	Smoke stack	25.00	
	Repairing boiler house	15.70	
	Heating plant for engineering hall	384.32	
			$ 1,840.37
4.	Appropriation for the repair and improvement of farm buildings, including the erection of swine houses and corn cribs—		
	Part payment toward erection of hog house, including painting	$ 545.57	
	Remodeling and repairing farm foreman's house and repairing farm barns	161.48	
			$ 707.05

5. Annual repair and improvement fund for 1891—		
Balance of W. B. Christy's contract for the enlargement and repair of the chemical and physical laboratory building	$ 982.00	
Other repairs on chemical and physical laboratory building	75.25	
Repairing engineering hall	23.00	
Repairing Morrill hall	6.20	
Repairing South hall	4.00	
North hall gas and water supply	50.09	
Sanitary building sewer	44.28	
Farm house drain	6.28	
Expenses of financial agency	11.65	
		$ 1,202.75
6. Annual fund for experimentation in agriculture and horticulture—		
Paid portion of cost of erection of experimental creamery		$ 3,156.79
Total		$ 9,531.24

The following are the appropriations of the Twenty-fourth General Assembly to the College:

For assembly room for students in connection with main college building; repair and improvement of chemical and physical laboratory, including steam heating; remodeling north hall; repairing engineering hall; addition to office building; finishing inside walls and other improvements in connection with Morrill hall; post office, express office, book room and waiting room; sewerage of college building; for completing the repairs of main college building, and for necessary repairs and improvements in connection with other college buildings	$ 12,500.00
For completion of creamery (including dormitory on second floor) and repair of barns	5,000.00
For building for agriculture, horticulture, veterinary science and agricultural chemistry	35,000.00
For repair and extension of steam heating and electric light plants	3,000.00
For repair and extension of water works	1,000.00
Total	$ 56,500.00

Early in the spring of 1892 the board of trustees proceeded to arrange for the erection of agricultural hall, the book department building, and the addition to the office building, and to carry out the other improvements and the repairs contemplated by the appropriation. A contract was entered into with Josselyn & Taylor, architects of Cedar Rapids, to prepare plans and specifications for the new buildings and superintend their construction for a compensation of five per cent on the cost of agricultural hall and three per cent on

the cost of the book department building and the office addition; only such supervision of these two latter buildings to be given as would not interfere with or increase the length of supervising visits to agricultural hall.

The knoll on which was located the College dwelling house occupied by Prof. Kent being selected as the site of the new agricultural building, it was decided to move the house of the professor to a point southeast of the farm house and east of the college driveway. The expense of moving and a portion of the expense of repairing the house, equivalent to the estimated cost of restoring it to its former condition, were charged to the agricultural hall appropriation, the balance of the bills for repairs being paid from the general repair and improvement fund.

The secretary having advertised for bids upon the basis of plans and specifications prepared by the architects, under the direction of the Board, these bids were opened at the June meeting, and were as follows:

Whiting & Wood, Des Moines	$33,092.69
L. Wallace & Son, Cedar Rapids	35,196.00
Henry Matter, Marshalltown	34,300.00
J. B. Jones & Co., Atlantic	37,584.00
O. J. King, Omaha	37,315.00

Each bidder was asked to state in his bid the deduction he would make for certain proposed changes in the plans. The above figures are the bids after all such deductions have been made. Jones & Co. and Mr. King not stating the amount they would allow for some of these changes, it is considered in the above that they would make the same deductions, in these cases, as proposed by Whiting & Wood.

Bids were also received at this time for constructing a students' assembly room in connection with the main building, but these bids are omitted, as the Board afterward changed its plans and by repairing and fitting up a portion of the main building for this purpose, provided recreation rooms for the students at a much less expense.

The lowest bid received, that of Whiting & Wood, when divided, showed the following figures for the separate buildings.

Agricultural hall	$27,369.90
Book-department building	1,808.43
Addition to office building	3,914.36
Total	$33,092.69

As the bid on agricultural hall did not include the heating and lighting plants, nor the stone for the lower stories, and as the architect's fee, the moving of the house from the site chosen, and other

necessary expenses would need to be provided for, the Board concluded that the appropriation of $35,000 would not warrant the acceptance of even this lowest bid. All bids were therefore rejected. The plans being then modified, Whiting & Wood reduced their bid $835.07, and agreed for an additional sum of $932 to furnish the rubble-stone for the foundation. A contract was finally made with them upon this basis. By leaving out the cement floor in the basement of the office building they were induced to lower their bid on the office building addition $65.00. Subtracting from the total amount of the Whiting & Wood contract ($34,750), the $1,625.38, which the contract itself provided should be deducted, if the assembly room were not built, we have $33,124.62 as the agreed price for the erection of the other three buildings, divided as follows:

Agricultural hall	$27,466.83
Book-department building	1,808.43
Addition to office building	3,849.36
Total	$33,124.62

As it was specified in the contract with Whiting & Wood that the College should furnish all stone needed, other than the rubble used in the foundation, the Board made arrangements with the warden of the Anamosa penitentiary to supply the amount required. The entire cost to the College, of this stone, was $3,075.89. As Whiting & Wood had reduced their bid on this account by $4,868.00, the saving thus effected was $1,792.11.

Under the authority of the Board, the building committee entered into a contract with Wallace & McNamara to put in the steam heating plant at agricultural hall for the sum of $3,075.00. A small boiler-house adjacent to the building was constructed by Whiting & Wood at a cost to the College of $277.80. The electric wiring was done by the Iowa Electric and Construction Company under contract for $364.00. The entire expenditures on account of agricultural hall amount to $36,973.91. Of this amount $315.00 was charged to the appropriation for the extension of the water works to cover the cost of tank, pipes and making connections with the College water supply system; $1,500 was charged to the State fund for experimentation to meet the extra expense of providing experiment rooms in the basement, for the horticultural department; and $300, since the building is to be occupied by experiment station offices, to the station building fund. The amount charged to the State appropriation for agricultural hall was $34,858.91 leaving an unexpended balance of the appropriation of $141.09. This will be needed in providing fixtures for the department rooms.

The Board directed that $308.43 of the contract price for the book department building should be charged to the surplus which had accumulated in that department, leaving $1,500.00 to be charged to the State appropriation. Stone steps were afterwards built, and steam pipes laid preparatory to making connections with the College steam heating plant, thus increasing the charge against the appropriation to $1,563.42.

Outside of the contract for the office addition the following was expended on account of this appropriation.

Extra to Whiting & Wood for door and areaways	$ 22.50
Plumbing, connecting with water system, and draining cellar	208.53
Architect's fee	115.48
Advertising and extra painting	9 20
Cement floor in cellar	30.00
Total	$ 385.71

Making with the Whiting & Wood contract ($3,849.36) a total of $4,235.07 charged to the State appropriation. The rooms of the old office building were papered, painted and otherwise repaired, at a cost of $164.10, which was paid from the rent derived from rooms in the second story of the building.

As shown by the last biennial report the Board had, prior to this biennial period, appropriated from the national and state experiment funds to the erection of a creamery, various sums aggregating $4,723.72. Of the appropriation of $5,000.00 made by the last General Assembly for the completion of the creamery and the repair of barns, $4,962.88 was used for the first of these purposes. Other expenditures on this account were charged to different improvement and repair funds, as follows:

To the appropriation for the extension of the college heating system, the cost of radiators and connections for heating second story	$ 404.00
To the general repair and improvement appropriation	1,004.33
To the annual repair and improvement appropriation	446.76
To the State experimental fund—the building being specially arranged for dairy experimentation	1,500 00
To the building fund of the national experiment station, a portion of the cost of the cheese annex	690.10
To the room rent fund certain repairs and improvements	137.93
Total	$ 4,183.12

This amount added to the $4,962.88 charged to the State appropriation for the completion of the building, makes $9,146.00 as the total of the funds of the biennial period used in completing the creamery. The total cost of the building is thus seen to be $13,869.72. It

supplies rooms for the creamery in its educational, experimental and commercial work, and furnishes living apartments in the second story for about fifty students.

The specific purposes for which the remaining appropriations were used are noted in the exhibits which follow. These exhibits also include the totals of the appropriations already explained. They give, on the one hand, the total of each appropriation; and on the other, a summarized statement of the expenditures to date, and the unexpended balance remaining in the State treasury. They are taken up in the order in which they occur in the appropriation bill :

GENERAL REPAIR AND IMPROVEMENT FUND.

Appropriation		$ 12,500.00
EXPENDITURES.		
Office building addition		$ 4,235.07
Book department building		1,563.42
Completion of creamery	$ 854.33	
Lockers for creamery building	150.00	
		1,004.33
Repair and improvement of chemical and physical laboratory		616.88
Morrill hall, improvements and repairs		932.89
College buildings, sewers		1,270.14
Repairs on engineering hall		232.14
Repairs on farm buildings		112.74
Repairs on south hall		38.02
Part of cost of building ice house		391.00
Repairs on house occupied by Professor Kent, in excess of amount charged to agricultural hall appropriation		574.32
Repairs on house occupied by Professor Marston		78.00
Repairs on barn and house moved from athletic grounds		123.30
Repairs on electric light and heating plant		410.00
Repairs on chimney of electric light plant		45.61
Repairs on College hospital		18.30
Repairs on veterinary hospital		15.96
Repairs on north hall		19.83
Moving coal shed		30.00
Agricultural chemistry water supply		4.57
Repairs on house occupied by foreman horticultural department		11.92
Repairs on main building		7.26
Miscellaneous		19.88
Total		$ 11,755.58
Balance in hands of state treasurer		744.42
Total		$ 12,500.00

COMPLETION OF CREAMERY AND REPAIR OF FARM BARNS.

Appropriation		$ 5,000.00
EXPENDITURES.		
Creamery—		
Lumber and hardware		$ 3,615 73
Pay rolls		949.35
Cement and plastering		154.17
Stone		95.58
Brick		18.24
Freight		110.04
Electric wiring		19.77
Total		$ 4,962.88
Barns—		
Repairs		37.12
Total		$ 5,000.00

AGRICULTURAL HALL.

Appropriation		$ 35,000.00
EXPENDITURES.		
Total of Whiting & Wood's contract	$ 27,466.83	
Extra allowance for pressed brick in arches in place of machine brick	125.00	
Extra for labor in trimming stone and delays caused by failure of stone to arrive promptly	700.00	
Extra for building tank room	65.00	
Total	$ 28,356.83	
Less deductions made for certain changes in building	110.25	
Balance		$ 28,246.58
Boiler house		277.80
Architect's fee		1,680.78
Wallace & McNamara, steam heating and plumbing		3,037.50
Iowa Electric and Construction Company, wiring		364.00
Anamosa Penitentiary, for getting cut stone	$ 900.00	
Freight on stone	1,466.89	
Unloading stone	9.00	
		2,375.89
Moving house, from site chosen for agricultural hall, and repairing same as heretofore explained		665.63
W. L. Thomas, sewer		77.09
Grading around building		24.58
Curtains and fixtures		122.05
Cleaning windows, etc		35.70
Advertising		30.90
Sundries		35.41
Total		$ 36,973.91

Deduct amount charged to other appropriations as heretofore explained—		
To water supply	$ 315.00	
To State experiment fund	1,500.00	
To national experiment fund	300.00	
		2,115.00
Total charged to agricultural hall appropriation		$ 34,858.91
Balance in State treasury		141.09
Total		$ 35,000.00

REPAIR AND EXTENSION OF STEAM HEATING AND ELECTRIC LIGHT PLANTS.

Appropriation	$ 3,000.00

EXPENDITURES.

Moving Morrill hall boiler and making connections	871.39
Heating plant, creamery building	404.00
Heating plant, chemical and physical laboratory building	544 00
Boiler, part paid by electric light department	523.60
Setting boiler	279.58
Connecting boiler with plant in engineering hall and chemical laboratory	26.05
Repair of electric light plant	179.00
Main building and boiler house roof	168.46
Sundries	3.92
Total	$ 3,000.00

REPAIR AND EXTENSION OF WATER WORKS.

Appropriation	$ 1,000.00

EXPENDITURES.

Agricultural hall water supply, including tank, pipes, etc	315.00
Pump for water works	153.00
Repairing main well	70.00
Hose for water works in main building	54.00
Repairs on main building water works	35 17
Office water supply	11.59
North hall water supply	21.24
Veterinary department water supply	53.62
Cottage water supply	60.76
Water supply for house occupied by foreman of horticultural department	32.08
Surveying for new water system	12.45
Total	$ 818.91
Balance in State treasury	181 09
Total	$ 1,000.00

The foregoing exhibits the expenditure of the appropriations of the Twenty-fourth General Assembly. The following are the expenditures on account of the annual appropriations.

ANNUAL REPAIR AND IMPROVEMENT APPROPRIATIONS.

Appropriations for the biennial period, $2,000.00 per year	$ 4,000.00

EXPENDITURES.

Paid toward completion of creamery		$ 446.76
Paid toward completion of swine house		180.62
Part of cost of building ice house		362.32
Repairs on farm barns		363.48
Moving old creamery and fitting it up for workman's house		172.57
Repairing foreman's house		70.25
Moving barn and house from athletic grounds		170.00
Main building—		
Cement areas	$ 230 38	
Other repairs	257.52	
		487.90
College sewers and drains		483.09
Repairs on old cottage		36.50
Repairs on Morrill hall		135.11
Repairs on chemical and physical laboratory building—		
Roof	$ 102.00	
Other repairs	125.81	
		227.81
Repairs on engineering hall		126.21
Repairs on College hospital		10.05
Repairs on veterinary hospital		53.99
Repairs on office building		24.36
Repairs on north hall		28.71
Repairs on south hall		4.05
Agricultural chemistry, water supply and repairs		9.43
Horticultural foreman's house, repairs and water supply		34.68
Professors' houses		10.65
Expenses land department and financial agency		41.50
Total		$ 3,450.04
Balance in State treasury		549.96
Total		$ 4,000.00

STATE EXPERIMENT FUND.

Appropriations for 1892-93	$ 3,000.00

EXPENDITURES.

Completion of creamery as hitherto explained	$ 1,500.00
Horticultural experiment rooms in agricultural hall	1,500.00
Total	$ 3,000.00

As already stated, a portion of the building fund of the national experiment station was devoted by the Board to the completion of the creamery building and the erection of agricultural hall. The account stands as follows:

NATIONAL EXPERIMENT STATION BUILDING FUND.

Amount appropriated by the Board		$ 990.10
EXPENDITURES.		
Amount paid toward erection of cheese annex to creamery		$ 690.10
Amount paid toward erection of agricultural hall to contain experiment station offices		300.00
Total		$ 990.10

Students occupying College buildings are charged room rent at the rate of three dollars or less per term. The fund thus obtained is in general devoted to keeping the rooms thus occupied in repair, or purchasing furniture therefor. It is, however, sometimes convenient to use it for improvements of a more general character and, as the other repair funds become available, use them to put the student rooms in order. This policy has been pursued during the last two years. The receipts and expenditures of the fund are shown below:

ROOM RENT FUND.

RECEIPTS.

Balance on hand at the beginning of the biennial period		$ 1,585.69
Receipts during the two years		4,870.12
Total		$ 6,455.81

EXPENDITURES.

Repairing main building and cottages		$ 3,807.99
Fitting up bath rooms		274.62
Repairing and resetting boiler, main building		621.05
College cistern		67.45
Carpets and other furniture for public rooms in main building		395.54
Water closet system, sanitary hall		170.09
North hall, repairs and improvements		101.39
South hall, repairs and improvements		52.52
Repairs on chemical and physical laboratory		47.60
Repairing farm department boiler		90.20
Purchase of house and barn moved from athletic grounds		350.00
Creamery repairs and improvements		137.93
Office repairs		139.74
Total		$ 6,256.12
Balance on hand		199.69
Total		$ 6,455 81

Grouping all the building, improvment and repair accounts under one head we have the following showing of available resources for the two years and results accomplished therewith.

TOTAL BUILDING, IMPROVEMENT AND REPAIR FUNDS.

RESOURCES.

Appropriation of the Twenty-fourth General Assembly—			
General repair and improvement fund	$ 12,500.00		
Completion of creamery building and repair of barns	5,000.00		
Agricultural hall	35,000.00		
Repair and extension of heating and electric light plant	3,000.00		
Repair and extension of water works	1,000.00	$	56,500.00
Annual funds—			
State repair and improvement fund for 1892-93	$ 4,000.00		
State experiment fund 1892-93	3,000.00		7,000.00
Total from the State		$	63,500.00
Experiment station building fund for 1892-93			990.10
Rent of rooms in College dormitories, including balance on hand at beginning of biennial period			6,455.81
Total		$	70,945.91

EXPENDITURES.

Agricultural hall charged to different appropriations as already stated		$	36,973.91
Completion of creamery, including heating plant and lockers for students, charged as explained			9,146.00
Extension of water works (other than agricultural hall water supply)			503.91
Chemical and physical laboratory repairs—			
Heating plant	$ 544.00		
Repairs	892.29		1,436.29
Office building—			
Addition	$ 4,235.07		
Repairs	164.10		4,399.17
Book department building			1,563.42
Sewers and drains of College buildings			1,733.23
Main College building and cottages—			
Repairs	$ 4,109.27		
Repairing and resetting boilers	621.05		
Repairing boiler house roof	168.46		
Cement areas	230.38		
College cistern	67.45		
Bath rooms	274 62		
Carpets and furniture for public rooms	395.54		5,866.77
Morrill hall—			
Moving and resetting boiler and making connections	$ 871.39		
Frescoing and repairs	1,058.00		1,929.39

Farm buildings—		
Painting and repairing barns	$ 513.34	
Repairing farm boiler	90.20	
Completing swine house	180.62	
Moving old creamery and fitting up workman's house	172.57	
Repairing foreman's house	70.25	
		1,026.98
Ice house		753.32
Repairing engineering hall		358.55
College hospital water closet system and repairs		198.44
Repairing veterinary hospital		69.95
North hall water supply and repairs		149.93
Repairing south hall		94.59
Repairing house occupied by Prof. Kent (amount not charged to agricultural hall)		574.32
Repairing house occupied by Prof. Marston		78.00
Repairing house occupied by other professors		10.65
Water supply and repairs of horticultural foreman's house		46.60
Agricultural chemistry water supply		14.00
Purchase, moving and repairing house and barn formerly located on athletic grounds		643.30
Repairing electric light and heating plant		634.61
Boiler, setting and connections		829.23
Moving coal shed		30.00
Expenses land department and financial agency		41.50
Sundries		23.80
Total		$ 69,129.66
Balance		1,816 25
Total		$ 70,945.91

The preceding exhibits show that the total amount expended is charged as follows:

To state appropriations	$ 61,883.44
To national experiment fund	990.10
To room rent fund	6,256.12
Total	$ 69,129.66

If the amount charged to the State appropriations, $61,883.44, be added to the balance, $9,531.24, shown by this report to have been to the credit of the old appropriations at the beginning of this biennial period, but since expended, we will have a total of $71,414.68 State funds accounted for. This agrees with the amount charged the College treasurer by the Board, the books of the secretary showing:

Balance of State appropriations in College treasurer's hands at the beginning of the biennial period		$ 1,305.97
Amount drawn from State treasury during fiscal year 1892		39,989.33
Amount drawn from State treasury during fiscal year 1893	$ 31,163.80	
Deduct amount returned to treasury	744.42	30,419.38
Total		$ 71,414.68

The total amount charged is thus accounted for, leaving no State funds in the College treasury.

The balance of $1,816.25, shown in the general exhibit, belongs to the following funds:

State appropriations not drawn from the State treasury—		
General repair and improvement fund	$ 744.42	
Agricultural hall	141.09	
Repair and extension of water works	181.09	
Annual repair and improvement fund	549.96	
		$1,616.56
Room rent fund in College treasury		199.69
Total		$ 1,816.25

The present building committee, Trustee Saylor chairman, has had charge of the building, improvement and repair funds during this biennial period. Within the limits of the law and the general orders of the Board, this committee has determined the improvements and repairs to be made, has entered into contracts, supervised their execution, made settlements with contractors, and exercised direction and control over all expenditures.

After a careful examination of the needs of the College the Board, at its annual meeting in November, decided to present the following to the Twenty-fifth General Assembly as the most urgent:

1.	Water supply		$ 21,500.00
2.	Ladies' hall		75,000.00
3.	Electric light plant		8,000.00
4.	Repairs on main building		4,000.00
5.	Forge shop and foundry		9,000.00
6.	Completion and improvement of creamery building		3,000.00
7.	General repairs and improvements—		
	Water heating system for office building	$ 1,000.00	
	Remodeling College hospital	700.00	
	Remodeling basement of chemical laboratory	150.00	
	Remodeling basement of physical laboratory	400.00	
	Extension and repair of steam heating plant	4,000 00	
	Improvement of barns and fencing	500.00	

	Fitting up laboratory in agricultural hall for department of agricultural chemistry and for chemical and veterinary sections of the experiment station	3,000.00	
	Repair and improvement of other College buildings	5,000.00	
			$ 14,750.00
8.	Greenhouse for horticultural department		5,000.00
9.	Magnetic observatory		1,000.00
10.	Experiment barn		5,000.00
11.	Carpenter shop		8,000.00
12.	Machine shop		8,000.00
13.	Annex to physical laboratory		1,000.00
14.	Astronomical observatory		3,500.00
15.	Armory		15,000.00
16.	Building for veterinary department to contain operating and dissecting room		5,000.00
	Total		$ 186,750.00

It was decided that the Board as a whole should constitute a committee to urge the necessity of these appropriations upon the general assembly. Chairman Wood and Trustees Boardman and Saylor were, however, appointed an executive committee to have special charge of all legislative matters.

LAND AND LOAN DEPARTMENT.

This department includes:

(*a*) The land belonging to the congressional grant.
(*b*) The land obtained by the foreclosure of endowment fund land.
(*c*) The land purchased with accumulated interest fund.
(*d*) Mortgage loans of accumulated interest.

The law under which the department is now managed was enacted by the Twentieth General Assembly, Chapter seventy-two. The agent in direct charge is Herman Knapp who was elected in 1887, and whose contract with the Board of Trustees will be found on page one hundred and fifty-nine of the twelfth biennial report of the College. Owing to the death of one of his bondsmen a new bond was given by Agent Knapp in the summer of 1893 and approved by the Board.

The financial transactions of the department for the biennial period are fully set forth in the reports of the agent and secretary. These reports show that the land feature of the College financial management is being gradually closed out. Patents have been issued during the two years on 16,889.97 acres, leaving 37,064.88 acres as the entire amount now owned by the College. No new leases have been made and but comparatively few renewals granted.

The secretary's report shows that the land at present owned by the College is appraised in the contracts with lessees at $130,169.70. These figures, representing the value to the College of this land, are often compared with the number of acres and the conclusion drawn that the trustees have either appraised the land too low or that the policy adopted by the legislature for its management was unwise.

Briefly stated, this policy fixed the value of each tract of land, charged the lessee an annual rental of eight per cent in advance upon such valuation, and gave him at the end of his ten years lease the right to purchase at the original valuation. It is urged that it would have been better management to have withheld the land from such optional sale and thus have realized upon the increase in value.

In this connection the following facts should be noted:

1. The land grant act passed by congress in 1862 contained the provision that each state accepting its benefits should, within five years, establish the college contemplated in the act or the grant should cease. Iowa accepted the grant, established the college and faced the question of its maintenance. It could have sold the land scrip at from fifty cents to one dollar an acre, as did the majority of the states and thus have realized an endowment of something like $200,000, by loaning which it could have secured the needed support fund; or, on the other hand, by locating the scrip and leasing the land it could have obtained the revenue necessary for its maintenance.

2. The latter policy having been adopted by the legislature the College land department was established in 1865. Government land being plenty, college land could not be leased and the needed income secured, except there was offered to the lessee the inducement of an optional right of purchase at a fixed valuation. The legislature, therefore provided for such form of lease. Only when such leases were forfeited could the valuation be increased. Many of those made in the early days have been renewed from time to time, the College preferring such renewal to payment by the lessee of the principal sum. These renewals account for the low average valuation of the land now under lease. Forfeited lands have been reappraised and, because of the optional clause, at a value generally above the market price. The endowment has thus been largely increased.

3. The endowment fund which, under the policy of selling the land scrip, would not have exceeded $200,000, is in round numbers $680,000. In the number of acres received under the land grant Iowa was nineteenth in the list of states. She is now third in the amount of endowment and second in the amount of income derived therefrom. The annual revenue which has gone to support the institution amounts, in the aggregate, to more than a million dollars. If,

instead of the policy of holding the lands for an increase in value, the annual revenue derived under the policy adopted had been loaned, and allowed to accumulate, it is doubtful if it would not, when added to the endowment itself, have exceeded the total value of the lands, if they had been held until the present time. The State chose to maintain the College rather than to add to the endowment by either of these methods.

4. These lands were situated in the northern and northwestern counties of the State, about 84,000 acres being located in Kossuth county alone. The land was non-taxable. Whatever might have been the advantage to the College, these counties would not have endured a speculative landlord system which withheld such a considerable portion of land from taxation and permanent settlement. Under the policy adopted the lessee acquired an interest in the land which was taxable, the College secured the means for its maintenance and the endowment itself has grown to be more than treble the market value of the land scrip on which it was based. On the whole it would seem as if the state ought to be congratulated on its management of this land grant fund.

5. Whether good or bad the system is practically a thing of the past. The land is leased and the contracts cannot be changed. The greater portion of the comparatively small number of leases now in force will expire in the next four or five years and the proceeds realized be transferred to the financial agency.

THE FINANCIAL AGENCY.

The financial transactions of the agency for the two years are summarized in the report of the secretary. Loans were made amounting to $142,541.06, and the uninvested balance was reduced from $19,-531.38 to $4,012.50. The total loans now in force aggregate $460,-050.33. During the nine and a half years since the establishment of the agency only two mortgages have been foreclosed, and in each of these cases the security has proven to be more valuable than the loan.

At the meeting of the Board in May, 1893, Agent Helsell presented a request for an increase of salary. Under the contract existing at that time between himself and the Board, he received $1,000 per annum and whatever commissions he might find it necessary to pay, not to exceed one per cent on any one loan nor $1,000 in the aggregate. The Board, after examining into the work of the agency, entered into the following supplemental contract with Mr. Helsell:

SUPPLEMENTAL CONTRACT WITH AGENT HELSELL.

This agreement, entered into this 22d day of May, A. D. 1893, between the Iowa Agricultural College and Farm and W. A. Helsell, as financial agent of the said Iowa Agricultural College and Farm, witnesseth:

That by mutual consent between the parties hereto, the first two sentences of section eight of the contract between the said Iowa Agricultural College and Farm and W. A. Helsell, dated June 15, 1891 (and found on page 116 of the fourteenth biennial report of the College), be stricken out, and in lieu thereof the following is hereby inserted, viz.: "He shall receive as salary, beginning June 15, 1893, the following: $1,200 per annum, also an amount equal to one per centum upon all loans made or renewed during the year, and such further sum to cover office expenses as the Board, in its discretion, shall at its May meeting in each year determine; provided, however, that the aggregate salary shall in no case exceed the sum of ($2,000) two thousand dollars in any one year.

JOHN H. WOOD,
Chairman of the Board of Trustees.
E. W. STANTON,
Secretary of the Board of Trustees.
W. A. HELSELL,
Agent of the Trustees.

The sureties on the bond of Agent Helsell gave written consent to the change in the contract and agreed to be bound on the bond the same as if no changes had been made in the contract. The written consent of the sureties and a copy of the supplemental contract have been filed with the State Executive Council.

The report of Agent Helsell submitted to the Board at its last annual meeting contained the following recommendations:

1. That a law be passed this coming legislature changing the per centage the College can lend from forty to fifty per cent. That is the law governing savings banks, and it would be a safe law to the College. Now it is not material, but the time may come before the law can be changed hereafter when it would be a decided advantage to the institution.

2. That a law be passed making loans of the College superior to any tax deed which may be obtained, *i. e.*, that any one who shall hereafter obtain a tax deed to any land upon which the College has a loan, shall hold the land subject to the rights of the College. This is the law in regard to the school fund and it protects that fund and saves annoyance and danger. It would insure absolute safety to the fund and do away with the necessity each year for the College to invest its money in small sums for taxes which are a bother to the treasurer and all concerned, besides the receipts are very apt to be mislaid and lost. Every year the College is compelled to invest from $200 to $500 for delinquent taxes which come back in small amounts and the interest on which is so small that it does not pay

for the postage used. The way suggested would obviate all this, make the College absolutely safe and yet in no manner interfere with the collection of taxes as any one who will buy at all will be willing to take, subject to the rights of the College as they now do to the rights of the school fund.

These recommendations were approved by the Board and the legislative executive committee was directed to endeavor to have the law so amended.

The following rule regarding the payment of the principal of loans was adopted:

Any borrower may pay off the principal of his loan before maturity by paying in addition thereto two per cent per annum for the unexpired term.

INCOME OF THE COLLEGE AND ITS EXPENDITURE.

The following shows the income of the College from national sources (exclusive of the experiment station fund) during the biennial period.

Cash on hand at the beginning of the biennnial term—		
Interest fund	$ 6,680.41	
Morrill fund	16,845.33	
		$ 23,525.74
Income from endowment fund 1892	$ 44,417.73	
Income from Morrill support fund 1892	18,000.00	
		62,417.73
Income from endowment fund 1893	$ 43,928.73	
Income from Morrill support fund 1893	19,000.00	
		62,928.73
Total available for maintenance and support		$ 148,872.20

This amount is accounted for as follows:

Expenditures as per exhibit "A," 1892	$ 70,227.45
Expenditures as per exhibit "B," 1893	63,119.47
Cash balance on hand	15,525.28
Total	$ 148,872.20

The expenditures were divided by the Board between the interest and Morrill funds as follows:

For fiscal year 1892—		
Charged to interest fund	$ 46,823.42	
Charged to Morrill fund	23,404.03	
Total		$ 70,227.45
For fiscal year 1893—		
Charged to interest fund	44,250 78	
Charged to Morrill fund	18,868.66	
Total		$ 63,119.47

Expenditures, other than salaries, are made by the heads of the different departments. Bills approved by them are afterwards passed upon by the president and secretary, who constitute the board of audit. It is the duty of the auditing board to see that all bills allowed are just and legal claims against the College, duly itemized, drawn against the proper funds, and that the Board of Trustees has made provision for their payment. Bills allowed by the board of audit are paid by the College treasurer.

It will be noted that the bills allowed and paid from interest and Morrill fund during 1893 amounted to $63,119.47. These bills represent the ordinary expenses of the College aside from experimentation. In the aggregate they do not differ greatly from the annual income of its support funds. Properly arranged they show the limit of what the College can accomplish with the funds now at its command and make clear the necessity of a larger income to meet the growing needs of the institution. The following is an analysis of these expenditures prepared under an order of the Board:

ANALYSIS OF COLLEGE EXPENDITURES FOR 1893.

1.	Salaries as per general salary list for 1893, which is similar to that of 1894, given in this biennial report under the head of College and Station Salaries, with exception of changes noted under "Officers of Instruction."		$ 34,221.96
2.	Salaries charged to departments—		
	Miss Marie Chambers, music	$ 400.00	
	Miss Genevieve Westerman, music	100.00	
	S. W. Beyer, geology and zoology	797.72	
	L. B. Spinney, engineering	800.00	
	Miss Minnie Roberts, mathematics Miss Julia Wentch, mathematics	929.99	
	F. C. Stewart, botany	250.00	
	G. L. McKay, dairy	300.00	
	Leo Thurlimann, chemistry	450.00	
	Miss Emma Boyd, chemistry	250.00	
	Miss Elmina Wilson, civil engineering	300.00	
	T. Lenox, engineering	1,000.00	
	H. Nordstrom, engineering	450.00	
	A. A. Quigley, engineering	240.00	
	A. A. Harter, engineering	360 00	
	W. W. Clark, engineering	250.00	
	Miss Emma McCarthy, library	300 00	
	J. A. Replogle, veterinary department	400.00	
			$ 7,577.71

3. General current expenses of the College—			
Sabbath services, expenses of visiting clergymen, conducting chapel services		$ 421.55	
Public grounds—care of lawn and roads, repair of bridges, building and repairing walks, purchase of mower, extension of drainage system, etc.		1,756.89	
Public rooms—heating, lighting and care of library, chapel, public offices and recitation rooms—			
Balance of bills of 1892	$ 156.39		
Expense for 1893	1,250.00		
		$1,406.39	
Contingent expense—			
Catalogue, advertising, stationery and printing	$ 2,257.42		
Stenographer for president's office	500.00		
Clerk hire in treasurer's office	132.43		
Clerk hire in secretary's office	56.70		
Telephone service	43.30		
Mail service	223.33		
Proctors for dormitories	404.00		
Ringing bell for recitations	75.00		
Supplies for department of English literature	30.00		
Supplies and student help for department of English	49.80		
Commencement address	42.00		
Legal expenses	150.00		
Agricultural College association fee	10.00		
Sundry miscellaneous items	62.00	4,035.98	
			7,620.81
4. Furniture—			
For public rooms in main building		170.27	
For new office building		652.50	
For College chapel		90.21	
For sanitary building, stoves		39.50	
For dairy department office		50 00	
For veterinary department rooms		164.00	
For library—chairs, cases, magazine holders, etc		221.93	
			1,388.41
5. Current expenses of departments—			
Farm—			
Excess of expenses over receipts covered in part by increase in ordinary farm supplies		$ 1,182.89	
Agricultural class work—class supplies		90.56	

Creamery—			
Excess of expenses over receipts, covered in part by increase in dairy supplies and expenses of exhibit at State fair		$ 924.57	
Veterinary—			
Care of hospital, forage, medicine, drugs, fuel, repair of instruments, etc.		290.35	
Mechanical engineering—			
Material for class instruction, stationery, etc.		94.04	
Civil engineering—			
Material for class work, stationery, express, printing, etc.		173.90	
Physics and electrical engineering—			
Supplies for laboratory and class work, meteorological observations and power rental for experimental purposes		305.44	
Mining engineering—			
Work bench, tools and class material		58.19	
Entomology and zoology—			
Laboratory material, labor, stationery, freight, express, etc.		30.64	
Botany—			
Water, labor, stationery, class and laboratory material		74.00	
Mathematics, and secretary's office—			
Type writer and supplies		128.86	
Military tactics and physical culture—			
Equipment and repairs, ammunition, music for band, prizes, stationery, etc.		362.52	
Domestic economy—			
Labor, utensils, and provisions for class work		297.17	
Library—			
Student labor, stationery, newspapers and incidental expenses		167.94	
Music—			
Programmes, notices, and music for public exercises		8.50	
			$ 4,189.57
(The figures given above represent the current expenses of the departments in excess of the income from all sources, including laboratory and shop fees paid by students).			
6. Additions to department collections and apparatus, and permanent improvements on farm (outside of buildings)—			
Farm—			
Permanent improvements consisting of bridge over Squaw creek, fencing and draining		$ 975.59	
Dairy apparatus		64.00	

Veterinary apparatus		$ 34.70
Mechanical engineering department—		
Milling machine	$ 475.00	
Universal grinding machine	382.50	
Large pipe machine	79.37	
Four turning lathes	240.00	
Laboratory apparatus	304.85	
Blue prints and small tools	310.77	1,792.49
Civil engineering department—		
Transit	$ 235.00	
Lettering and mapping device	130.00	
Forty-five drawing boards	105.00	
Pantograph, drawing instruments other apparatus	111.00	581.00
Physics and electrical engineering—		
Apparatus purchased	$ 391.00	
Apparatus constructed, including galvanometer, storage cells, alternating meters, linear expansion apparatus, etc., valued at $1,500, but costing	926.96	1,317.96
Chemistry—		
Chemicals for class exhibition	$ 50.00	
Steam generator for distilled water	50.00	
Drying ovens	35.00	
Reagent bottles	36.00	
Balances	40.00	
Burettes	35.00	
Lamps	12.00	
Burette stands and similar apparatus		40.00
Platinum goods	100.00	
Blast apparatus	25.00	
Minor pieces of apparatus amounting to	159.99	582.99
Entomology and zoology—		
New museum case	$ 96.26	
Insect boxes and cork	21.94	
Bahama expedition collection	200.00	
Collection of insects, mammal skins, Iowa birds' eggs, southern reptiles, and mounting, labeling and cataloging permanent additions	324.08	
Laboratory apparatus and department fixtures	91.46	733.74

Botany—			
Hitchcock collection	$ 100.00		
Mounting and labeling specimens	96.49		
Case and refrigerator	42.00		
Fungus atlas, sketches and photographs	47.95	286.44	
Library—			
Books and periodical, about 1,200 volumes		2,021.13	
Music—			
Piano		302.00	8,692.04
Total expenses			$ 63,690.50
Less excess of receipts over expenditures—			
In horticultural department		$ 569.14	
In dairy and agricultural chemistry		1.89	571.03
Net expenditures			$ 63,119.47

The expenditures summarized give the following:

SUMMARY OF EXPENDITURES FOR 1893.

1.	Salaries as per general salary list	$ 34,221.96	
2.	Salaries charged departments	7,577.71	
3.	General current expenses of the College	7,620.81	
4.	Furniture	1,388.41	
5.	Current expenses of departments	4,189.57	$ 54,998.46
6.	Additions to department collections and apparatus		8,692.04
	Total expenses		$ 63,690.50
	Less receipts over expenditures in certain departments		571.03
	Total net expenses		$ 63,119.47

A similar analysis of the appropriations for the fiscal year 1894, shows that the income of the year from interest and Morrill funds will be devoted approximately to the following purposes:

SUMMARY OF EXPENDITURES FOR 1894.

1.	Salaries as per salary list given under "Officers of Instruction"	$ 35,750 00		
	Salary of Prof. Smith for part of 1893	750.00	$ 36,500.00	
2.	Salaries charged to departments		8,100.00	
3.	General current expenses of the College		6,855.00	
4.	Furniture		1,000.00	
5.	Current expenses of departments		5,366.50	$ 57,821.50
6.	Additions to department collections and apparatus			6,760.00
	Total			$ 64,581.5

The foregoing does not include the experiment station, a statement of whose expenditures for the government fiscal year ending July 1, 1893, is given in the treasurer's report. The assignments of that fund for the year ending in 1894 will appear under the heading "Experiment Station."

The appropriations from interest and Morrill fund for 1894, arranged according to departments, are in detail as follows:

FROM INTEREST AND MORRILL SUPPORT FUNDS.

For salaries—			
Salary roll for 1894	$ 35,750.00		
Salary of Prof. Smith for part of the school year 1893	750.00	$	36,500.00
For department of agriculture—			
Farm credit	650.00		
Permanent improvements	450.00		
Class illustration and contingent expenses	200.00		1,300.00
For creamery—			
Creamery credit			1,000.00
The creamery was authorized to collect milk daily during the winter if the interest of the winter dairy school should require it, and the Board agreed to allow a claim against the interest fund for payment of extra expense in doing so, the claim to be as small as possible, and in no case to exceed for the winter of 1893-4			300.00
For dairy—			
Apparatus	$ 400.00		
Class illustration and contingent expenses	100.00		500.00
For department of horticulture—			
Experimentation and current expenses			800.00
For veterinary department—			
House surgeon	$ 200.00		
Current expenses and apparatus	350.00		550.00
For department of mechanical engineering—			
Assistant	$ 400.00		
Machinist	1,000.00		
Carpenter and helper	600.00		
Blacksmith	360.00		
Fireman-engineer	540.00		
Machinery, apparatus and current expenses	1,550.00		
Part of last year's balance	25.00		4,475.60
For civil engineering department —			
Assistant	$ 300.00		
Stands and cases for drawing boards, new apparatus and current expenses	800.00		1,100.00

For department of physics and electrical engineering—		
Assistant	$ 400.00	
Weather observer	50.00	
Laboratory supplies	180.00	
Power rental	100.00	
Standard apparatus, apparatus construction, and current expenses	850.00	1,580.00
For mining engineering—		
Current expenses		75.00
For department of military science and physical culture		200.00
For department of chemistry—		
Assistants	$ 750 00	
Current expenses and apparatus	500.00	1,250.00
For department of agricultural chemistry—		
Apparatus, chemicals and current expenses		100.00
For department of entomology and zoology—		
Assistant	$ 800.00	
Expert to mount mammals	150.00	
Case for mineral collection, etc., museum matter (including material from World's Fair), microscopes, refitting microscopes, etc	350.00	
Current expenses	200.00	1,500.00
For department of botany—		
Assistant F. C. Stewart	$ 300.00	
Current expenses, urgent, equipment, bacteriological case and extending collection	300.00	600.00
For department of mathematics and secretary's office—		
Assistants and clerk hire		1,350.00
For department of domestic economy		300.00
For department of music—		
Miss Chambers for instruction of freshman class in sight singing, and taking charge of music at public exercises	$ 400.00	
Instrumental music at public exercises made payable through the director of music	100.00	
Programs, notices and music for public entertainments	41.50	541.50
For Library—		
Librarian	$ 500.00	
Assistant librarian	100.00	
Current expenses and general purchases to be divided among departments in same proportion as last year	2,000.00	
Books for botanical department	50.00	
Books for president's department	30.00	
Books for department of music	25.00	2,705.00

For public grounds			1,200.00
For Sabbath services			425.00
For public rooms—			
Furniture for music hall, agricultural hall and public rooms in main building, to be expended under the direction of the building committee		$ 1,000.00	
Fund set aside to cover that part of the expense of heating, lighting and care of public rooms, not met by the income from student charges		1,500.00	
			2,500.00
For contingent expenses—			
Stenographer for president's office.		$ 625.00	
Catalogues, printing, stationery and advertising		1,600 00	
Advertising dairy school		45.00	
Aurora advertising for 1893		50.00	
College papers for 1894, advertising		50.00	
Junior Annual, advertising for 1894, the Annual to contain nothing not approved by the president		50.00	
Telephone service		60.00	
Ringing bell for recitations		75.00	
Mail service		270.00	
Proctors		275.00	
Assistant to preceptress		75.00	
Address before College and trustees		50.00	
Dedication of agricultural hall.		40.00	
Mounting map and stationery for English literature department		20.00	
Supplies and student assistant for department of English		75.00	
Clerks for treasurer's office	$ 700.00		
Paid from steward's department.	600.00	100.00	
Ledger for treasurer's office		20.00	
Record book for secretary		20.00	
Annual fee Agricultural College association		10.00	
Fund for attending teachers' institutes, farmers' institutes and associations (intended for president and professors authorized by the president to attend such meetings)		70.00	
Emergency fund		150.00	3,730.00
Total			$ 64,581.50

The proceeds of the ordinary sales of the year were also appropriated to the departments. All appropriations were made subject to the provision that only so much thereof as may be necessary shall be expended.

It being found that the appropriations for 1894 fully equaled the estimated income, the secretary was directed to notify the heads of the different departments that the appropriations made will exhaust the income for the year, and that the Board desire the utmost possible economy in the expenditure of such appropriations.

It was ordered that not more than one-half of the appropriation to any department for the purchase of apparatus shall be expended before August 1, 1894, unless the approval of the board of audit is secured before the expenditure is made; the general policy of all expenditures to be determined upon consultation with the president of the College.

The College departments desiring to make exhibits at the State Fair in 1894 were asked to present to the Board at its May meeting detailed plans and estimates of the cost of such exhibits.

Professors and officers of the College were directed not to use any portion of the amount appropriated to their departments for current expenses and apparatus, in the purchase of furniture, without special authority from the Board of Trustees.

Departments were ordered to make monthly settlements with each other.

The appropriations of the year were divided between the interest and Morrill support fund, as follows:

Interest fund—			
Salaries for 1894 as per salary list	$ 17,100.00		
Salary of Prof. Smith for part of 1893	750.00		
Apparatus, assistants and expenses of departments	28,081.50	$	45,931.50
Morrill fund—			
Salaries for 1894 as per salary list			18,650.00
Total		$	64,581.50

It was made the duty of the standing committees of the Board, hereafter, to investigate the needs of the departments under their charge, consider and report upon appropriations recommended by the president and supervise their expenditure as they deem best. At the close of the year each committee shall examine the vouchers and accounts of the departments under its charge, inquire fully into the character and amount of expenditure of each and make such report thereon as shall give the Board full information concerning the financial management of the respective departments.

OFFICERS OF INSTRUCTION.

A list of the officers of instruction for 1892, with their salaries is given on page 130 of the last biennial report. The list for 1893 was the same, except the following: Gen. J. R. Lincoln, having resigned as steward, to take effect December 1, 1892, was elected to the newly created chair of mining engineering, at a total salary as professor of military science and mining engineering of $1,600 per annum and $200 in lieu of a house, his increased salary to begin with the date of his resignation as steward; Miss Stephanie Marx, resigning as preceptress and professor of French and German, Miss Celia Ford was chosen to the vacancy at the same salary, $1,200 per annum; the chair of assistant professor of agriculture, in charge of dairying, having been established, Henry C. Wallace, of the class of 1892, was elected to the position at a salary of $1,500, and $200 additional in lieu of a house, his salary to be divided equally between the interest and experiment station funds; $850, of the salaries of Professors Budd, Osborn and Pammel, was transferred from Morrill to experiment station account; Professor Bissell, who had been acting as professor of mechanical engineering, was elected to that chair at the salary hitherto allowed; his former position, assistant professor, was filled by the election of W. H. Meeker, at a salary of $1,400; the appointment, by the president, of A. Marston to the chair of civil engineering, left vacant by the resignation of Professor Church, was confirmed by the Board, his salary being fixed at $1,600 and the use of the house vacated by General Lincoln; Mr. Hansen, the assistant in horticulture, was given the title, assistant professor; Professor Pammel, having moved to Ames, the house formerly occupied by him was assigned to Professor Patrick, whose salary for the year was fixed at $1,600 and use of house; Professor Barrows was relieved of preaching, except occasional calls, when the president was unable to secure a supply.

In 1893 the following changes occured: Dr. Fairchild, resigning to take effect at the end of the spring term, Dr. I. W. Smith, of Charles City, was elected to the vacancy at the usual professor's salary, $300 of which was ordered charged to the College hospital fund. The resignation of Miss Thomas, librarian and professor of elocution, to take effect at the close of the school year of 1893, was accepted; elocution was given in charge of Miss Marie Chambers at an additional salary of $500; Miss Flora Wilson was elected librarian to serve during the first half of 1894 at a salary of $500 per annum; the salary of Dr. Beardshear was increased from $3,500 to $3,850; the portion of the salaries of Professors Budd, Osborn and Pammel, amounting to $850, which the Board, at its meeting in December,

1892, had transferred from Morrill to experiment station account, was ordered charged again, after December 1, 1893, to the Morrill fund.

Noting these changes the salary list for 1894, will stand as follows, increase in salaries and new salaries to begin March 1, 1894; all salaries to be payable from funds as specified:

SALARIES FOR 1894.

NAME AND DEPARTMENT.	Interest fund.	Morrill fund.	Station fund.	Total.
W. M. Beardshear, A. M., LL. D.	$ 3,850	$	$	$ 3,850
President.				
Psychology and ethics.				
M. Stalker, M. Sc., V. S.	.....	1,600	.....	1,600
Veterinary science.				
Station veterinarian.				
J. L. Budd, M. H.	.....	1,700	300	2,000
Horticulture.				
Station horticulturist.				
E. W. Stanton, M. Sc	600	1,600	.....	2,200
Mathematics and economic science, $1,600.				
Secretary board of trustees, $600.				
Gen. James Rush Lincoln	1,800	.....	.....	1,800
Military science and tactics.				
Mining engineering.				
Alfred A. Bennett, M. Sc.	800	800	.....	1,600
Chemistry.				
Herbert Osborn, M. Sc.	.....	1,300	300	1,600
Zoology and entomology.				
Station entomologist.				
A. C. Barrows, A. M., D. D.	1,800	.....	.....	1,800
English literature and history.				
L. H. Pammel, B. Agr.	.....	1,500	300	1,800
Botany.				
Station botanist.				
Mrs. Eliza Owens	800	.....	.....	800
Domestic economy.				
James Wilson	.....	1,250	1,250	2,500
Agriculture.				
Director of experiment station.				
G. E. Patrick, M. Sc.	.....	800	800	1,600
Agricultural chemistry.				
Station chemist.				
Miss Margaret Doolittle, A. B.	900	.....	.....	900
English, Latin and rhetoric.				
W. S. Franklin, M. Sc.	.....	2,000	.....	2,000
Physics and electrical engineering.				
G. W. Bissell, M. E.	.....	1,800	.....	1,800
Mechanical engineering.				
A. Marston, C. E.	.....	1,600	.....	1,600
Civil engineering.				
Miss Celia Ford, A. B.	1,200	.....	.....	1,200
Preceptress.				
French and German.				
I. W. Smith, B. Sc., M. D.	1,500	.....	.....	1,500
Pathology, histology, therapeutics and comparative anatomy, $1,500.				
College physician, $300, paid from hospital fees charged students.				
D. A. Kent, B. Sc.	.....	1,500	.....	1,500
Agriculture.				
C. F. Curtiss, B. S. A.	.....	.....	1,700	1,700
Station assistant				
W. B. Niles, D. V. M.	.....	1,200	500	1,700
Veterinary science.				
W. H. Meeker, M. E.	1,400	.....	.....	1,400
Mechanical engineering.				
Marie L. Chambers	500	.....	.....	500
Elocution.				
N. E. Hansen, B. Sc.	400	.....	400	800
Horticulture.				
H. C. Wallace, B. Agr.	850	.....	850	1,700
Dairying.				
Herman Knapp, B. S. A.	700	.....	250	950
College treasurer and recorder, $700				
Station treasurer, $250.				
Total.	$ 17,100	$ 18,650	$ 6,650	$ 42,400

It will be noticed that the salaries charged to the Morrill fund amount to $18,650. These constitute the sole charges against that fund for 1894.

The following salaries are included in the appropriations to the departments, and are paid from interest fund:

Miss Marie Chambers, music	$ 400.00
Miss Genevieve Westerman music	100.00
S. W. Beyer, geology and zoology	800.00
L. B. Spinney, engineering	800.00
Miss Minnie Roberts, mathematics	750.00
Miss Julia Wentch, mathematics, and secretary's office	600.00
F. C. Stewart, botany	300.00
Leo. Thurlinann, chemistry	500.00
Miss Emma Pammel, chemistry	125.00
S. R. Fitz, chemistry	125.00
Miss Elmina Wilson, civil engineering	300.00
T. Lennox, engineering	1,000 00
H. Nordstrom and helper, engineering	600 00
W. W. Clark, engineering	540.00
———— blacksmith, engineering	360 00
Miss Flora Wilson, library	500.00
———— library	100.00
C. M. Day, veterinary science	200.00
Total	$ 8,100.00

Houses on the College grounds are occupied by Professors Bennett, Osborn, Wilson, Kent, Patrick, Marston and Stanton. Mrs. Owens is granted the use of that portion of South hall not occupied by the department of domestic economy.

The following order was adopted by the Board:

Any professor or assistant accepting or holding a position in this institution, shall continue his work through the College year unless his resignation is accepted by the Board. Resignations to take effect during the following year shall be presented to the Board through the president by January 1, of each year.

COLLEGE TREASURER.

Herman Knapp has served as College and Station treasurer and College recorder during the biennial period. Under the law he is elected annually. Prior to his election for 1893, he received a salary for the offices mentioned of $950 per annum. As land and loan agent he received certain fees provided for in his contract. By mutual agreement, between himself and the Board, his salary as treasurer, recorder and agent for 1893, was fixed at $1,250, and he was required to pay over to the College any excess of fees above the $300 necessary to bring his salary up to that amount. He was re-elected for 1894 upon the same conditions. He also receives $150 from the book department as superintendent, and $100 from the steward's department for taking charge of the steward's accounts, thus making his total salary $1,500.

The Board settle with him directly as manager of the book department. As agent and treasurer an account is kept with him by the secretary. He is charged with and must account for all lands placed in his hands or funds intrusted to him for investment. As treasurer he is charged by the secretary with all money paid to him from any source and credited with all amounts paid out by him on bills ordered paid by the board of audit. His account is balanced and frequent settlements made. At each annual meeting of the Board a special committee, appointed for that purpose, examines the treasurer's vouchers and accounts. Trustees Secor and Dunbar in 1892, and Secor and Wood in 1893, performed this duty. They report the treasurer's accounts as correct and commend him for the neatness and accuracy of his books and the methodical manner in which the business of his office is conducted.

EXPERIMENT STATION.

The station is supported by an annual congressional appropriation of $15,000, payable in quarterly installments. The salaries of the station staff are fixed by the Board of Trustees. The balance of the fund is appropriated to the station and divided among the different sections by the board of direction. The fund can legally be used only for experimentation, and has always been devoted strictly to that purpose. It is even then insufficient to meet the legitimate and pressing demands for experimental work. The disbursements for the College fiscal year just closed exceeded the income by $1,327.13, thus reducing the working cash balance by that amount and leaving only $474.68 with which to meet the bills of the remaining two months of the present quarter. To aid the station financially, and also as a matter of better policy, the Board arranged to transfer from the station to the farm, live stock valued at $1,295. From cattle and hogs soon to be marketed the station will realize about $1,200. Sale notes amounting to $190 will also become available during the year. Practicing, however, the most rigid economy, the station will need to limit its plans and leave much important experimental work undone in order to bring its expenses within its income. The fund for the government fiscal year ending June 30, 1894, has been divided by the board of direction as follows:

DIVISION OF EXPERIMENT STATION FUND.

FOR GOVERNMENT FISCAL YEAR ENDING JUNE 30, 1894.

(1)	Salaries of station staff, as already given under "Salaries of 1894"		$ 6,650.00
(2)	Salaries of assistants—		
	F. C. Stewart, botany	$ 250.00	
	F. A. Sirrine, entomology	400.00	
	W. H. Heileman, chemistry	400.00	1,050.00
(3)	Bulletins—printing and distributing		2,000.00
(4)	Appropriations to sections—		
	Agriculture	$ 1,900.00	
	Botany	320.00	
	Entomology	400.00	
	Chemistry	600.00	
	Veterinary science	400.00	3,620.00
(5)	General expenses—		
	Heating of building and janitor service	$ 360 00	
	Mail and express	100.00	
	Expenses of directors' office, stationery and supplies	100.00	
	Water for different sections	100.00	
	Miscellaneous items	320.00	980.00
(6)	Building fund—		
	Payment toward erection of agricultural hall	$ 300.00	
	Fitting up rooms for agricultural chemistry	300.00	
	Other repairs and improvements	100.00	700.00
	Total		$ 15,000.00

DEPARTMENT OF AGRICULTURE.

At the meeting of the Board of Trustees in December, 1892, the committee on agriculture, Trustee Boardman, chairman, reported that they had made a careful examination of everything connected with the farm; amount of crops raised during the year, care and condition of stock, provision made for the shelter of the latter during the winter, and that they had found all in a satisfactory condition. The committee made a thorough investigation of the inventory of the department and checked up the items on the same with the exception of the farm machinery and farm tools.

This latter portion of the inventory, amounting to $2,777.51, remained the same as at the beginning of Professor Wilson's management of the department. It contained a large number of articles of no use to the farm, and many that were absolutely worthless. Under the orders of the committee it was divided into two parts, one containing all articles of use, inventoried at their actual value, and the other the

balance of tools and machinery, listed without value. These latter the department was directed to sell at what they would bring. The first part, after revision, amounted to $870.50. The other portion of the inventory, covering the horses, cattle, hogs, sheep and field crops and amounting to $13,622.00, was deemed by the committee to be conservative and reasonable. It was ordered that each animal be listed by its herd name and number and that the complete inventory, as revised, be filed with the secretary of the Board.

At the annual meeting in November, 1893, the committee reported:

"We have examined the invoice of the farm for the present year and are satisfied that it is reasonable and just, and that a statement of the business of the department based upon it will be correct, and fair to all parties. The present farm committee has had supervision of the department for two years. The following statement will show the present financial condition of the farm and its profit or loss during that time:

DR.

Invoice of 1891 (invoice of tools not included)	$ 9,462.64	
Appropriation for help 1892	600.00	
Appropriation for buying stock 1892	1,700.00	
Experiment station for stock	1,295.00	
Credit for 1892 not repaid	1,800.00	
Credit for 1893 not repaid	1,182.89	
Total debits for two years		$ 16,040.53

CR.

Invoice of 1893		$ 17,142.67	
Deduct that part of the invoice of machinery not in invoice of 1891	$ 870.50		
Cash and bills receivable from same source	106.00	976.50	
Profit for two years			125.64
Totals		$ 16,166.17	$ 16,166.17

This report shows that the profit of the farm after two years is $125.64, to which should be added $400.00, which was expended in permanent improvements and paid out of the general expense fund of the farm. This statement includes, on debtor side, all funds donated outright by the College to the farm during the two years. The actual debts of the farm at this time, are as follows:

Interest fund, credit of 1892, expended	$ 1,800.00
Experiment station for stock	1,295.00
Interest fund, credit of 1893 expended	1,182.89
Total	$ 4,277.89

This should be reduced by $400.00, the amount expended during 1892 for permanent improvements and paid out of the general expense funds of the farm, which would make actual indebtedness of the farm $3,877.89."

Upon the recommendation of the farm committee, it was ordered:

1. That the indebtedness of the farm to interest fund be reduced by $400.00 for the reasons given in the committee's report.

2. That the bills receivable taken at the stock sale in October, amounting to $869.00, with interest, be collected when due by the College treasurer and applied toward repaying the credit advanced by interest fund for 1892.

3. That an annual sale of surplus stock be established to take place during the month of September or October.

4. That the department make an itemized statement each year of such annual stock sale and file the same with the secretary, and deliver the notes to the treasurer and take his receipt for the same.

5. That the farm committee each year go over the inventory and examine each article or animal and approve the value of the same.

The claim of the College against the Chicago & Northwestern railroad for the killing of stock and damage by fire, amounting to $1,195.00, was referred to Trustee McElroy and Professor Wilson as a committee, who were authorized to examine into the justice of the claim, employ counsel, and take all necessary legal steps to protect the interests of the College.

The College garden, which for two years had been under the charge of the farm department, was transferred to the experiment station.

CREAMERY.

The creamery building, including the cheese annex and dormitory rooms in the second story, sufficient to accommodate fifty students, cost, as was shown in the statement of expenditures given under State appropriations, the sum of $13,869.71. The appropriations by the Board, from interest fund, for machinery and apparatus, amount to $5,500.00. The commercial business of the two years has averaged about $20,000.00. During 1892 the salary of Mr. Leighton, foreman of the creamery and instructor in dairying, was charged to interest fund. Since then it has been paid from the receipts of the department. It was advanced in May last from $75.00 to $100.00 per month.

The educational and experimental work of the creamery is set forth in the reports of the officers in charge. The financial results of the two years are shown by the report of the farm committee to be as follows:

CREAMERY FINANCIAL STATEMENT.

1892 AND 1893.

DR.

To interest fund credit used in 1892	$ 299.65	
To interest fund credit used in 1893	902.04	
		$ 1,201.69

CR.

Inventory for 1893	$ 923.26	
Loss for two years	278.43	
		$ 1,201.69

As a result of the two years' work it may be stated that the creamery has borrowed $1,201.69 from interest fund, has resources on hand sufficient to pay all but $278.43 of the amount, and has furnished to the educational part of the dairy, the services of Mr. Leighton without expense to interest fund during the year 1893.

It was directed:

1. That all new machinery needed and repairs of the machinery in use, be paid from the earnings of the creamery.

2. That the rent from the dormitory rooms in the creamery for summer and winter school, be set aside as a fund to maintain the creamery building in repair.

OTHER COLLEGE DEPARTMENTS.

The work done during the biennial period in the different College departments is given in the reports of the professors in charge.

The following new or revised rules applicable to all departments were adopted by the Board:

1. Immediately after the adjournment of the Board, and at any other time when requested, the secretary shall furnish each head of department, in writing, with the amounts appropriated for the use of such department, and no part of any appropriation for improvements, repairs, instruction, or any purpose whatever, shall be expended by the party having charge thereof, until he shall have secured from the secretary such written statement of the amount appropriated, and all conditions connected with its expenditure.

2. The head of each department shall keep a current and accurate memorandum of all appropriations to his department, and of all orders which he may issue against the same. No obligation shall be incurred in excess of such appropriation, and for such excess, and for any and all obligations not authorized by a recorded vote of the trustees, the head of the department contracting the same shall be held personally responsible.

3. All departments employing labor are required to keep a permanent and itemized book account of dates of all services, character of service, and hours employed each day, to be open on call to the inspection of the board of audit.

4. No head of a department or other officer or employe of the College shall erect or repair any College building unless legal provision shall have been made for the expense thereof, and authority for making the particular improvement shall have been obtained of the building committee in writing.

The mechanical department in making repairs for other departments may, when necessary for convenience and economy, use material which it has in stock, promptly billing the same at the end of each month against the proper repair account; but in case new material is purchased, it shall be charged directly to the State appropriation.

The farm and the mechanical departments are authorized to employ their regular workmen, who are paid by the month, in making authorized building improvements, but in such case a full, itemized statement of the work thus performed by each workman shall be embodied in, or attached to, the monthly work report of the department, which report shall be accompanied with itemized bills against the proper State appropriations, on account of which the work has been performed. Except as herein provided, no person employing labor or purchasing material in connection with any building shall charge the cost of the same to any department account. All items appearing upon any bill against the College for material which might be used in any way in the erection, repair, or improvement of any building, shall be fully explained upon said bill by the officer making such purchase. Each officer, with the exception herein specified, shall certify that no portion of said material is to be used in connection with any building or buildings.

5. The heads of all departments shall certify to the treasurer on or before the first day of each month all charges against students or patrons which have not already been reported. The accounts against students shall be collected by the treasurer. All accounts against patrons shall be collected by the treasurer, who shall certify all such payments back to the officer from whom the charge or account came.

6. All moneys collected by College departments shall be promptly paid over to the College treasurer not later than the 6th of the following month.

The following action taken by the Board relates to particular departments:

1. The building formerly occupied by the experiment station was assigned to the department of music. It was considered that such use of this building by the College would be compensated to the experiment station by its occupancy of rooms in agricultural hall.

2. The use of the upper floor of the barn east of south hall was assigned to the domestic economy department, and the lower floor of the barn, with the lot, to the department of public grounds.

3. Under the direction of the Board, the department of civil engineering has prepared a map of the College campus, giving location of buildings, driveways, sewers, drains and water pipes; also plans of the main building and boarding cottages, showing wiring and piping systems. The department has now in preparation a map of the farm, locating buildings, fields, and tile drains.

4. The department of agricultural chemistry is authorized to do commercial work, and to employ additional help provided such additional help be paid from the funds received for the commercial work. The professor in charge of the department is required to itemize the cost of chemicals, gas, etc., belonging to College or station, used in doing work for each outside party, as soon as the work is done, file the same with the treasurer, and at the end of the College year settle for all material used. He is ordered to make at the close of each College year an itemized statement of the work of this kind done in his department and the amount charged for the same. The professor is also allowed to supervise the chemical work of the geological survey, and receive such compensation as he may be able to get therefrom, furnishing the treasurer with such bills for collection against the geological survey as will pay for gas, water, chemicals, etc., used.

5. The president is authorized to make such arrangements as he may deem advisable for the occasional opening of the library during the winter vacation, providing the same can be done without any additional expense to the College.

THE COLLEGE HOSPITAL.

The College hospital is supported by a fee of $1.25 per term paid by each student rooming in the College dormitories. Students not boarding on the College grounds are entitled to the privileges of the hospital upon the payment at the beginning of each term of the same fee, but it is understood that visits are not to be made to their boarding houses. For the fee stated students are furnished all needed medical attendance, medicine and nursing, except in chronic cases not originating during College residence. The president and the College physician are authorized to make extra expenditures from the hospital when necessary to provide for the sick during emergencies or epidemics. Owing to the opening of the hospital for students of the

winter school of 1892-3, and the serious illness of one of their number, the expenditures of the biennial period have exceeded its income and led to a present indebtedness of something over $20. This will be paid from the hospital revenues of next year. The Board ordered that hereafter no hospital fee be charged students of the winter school and that the hospital be not opened for such students except at their expense. It is expected that hereafter the receipts from the students will be fully sufficient to meet the cost of maintenance. The hospital has hitherto occupied only the second story of the sanitary building. The veterinary department has now moved to its new home in agricultural hall, and the Board asks the legislature for an appropriation of $700 for remodeling the lower floor for hospital purposes. It is hoped in this connection to make many needed improvements, including the establishment of a detached diet kitchen.

The hospital is under the direct control of the College physician, Dr. I. W. Smith, who receives $300 per annum for his medical services.

THE BOARDING DEPARTMENT.

This is not strictly one of the College departments, as it receives no support in any way from College funds. Its expenses are paid entirely from its receipts. The Board of Trustees manage it, however, in trust for the students. During 1892 it was under the charge of Gen. J. R. Lincoln, who received for his services $1,000 and board during the school year. General Lincoln having been elected to the chair of mining engineering, resigned his position of steward, to take effect December 1, 1892. Trustees Wood and Sells, the committee appointed by the Board to make settlement with him, reported that they had examined his books, found them neatly and correctly kept, and that there was in his hands to the credit of the different divisions of the steward's fund a cash balance of $1,322.12. The work up to this time included in the steward's department, was now divided into the boarding department proper and the department of fires, lights and incidentals. In the division of the balance on hand it was found that $995.68 belonged to the former and $326.44 to the latter account. The newly established department of fires, lights and incidentals is treated under that head further on in this report. The boarding department, as limited by the new arrangement, was placed under the charge of C. V. Anderson, who was allowed for the services of himself and wife a salary of $1.200 and board.

An entirely new plan was adopted for the collection and disbursement of the funds of the department and the keeping of its accounts. Hitherto this work had been done by the steward. It was now placed largely in the hands of the treasurer, as shown by the following orders of the Board:

1. After December 1, 1892, the students and other patrons of the boarding department shall settle directly with the treasurer upon certified itemized statements of the steward, which shall include all charges against him. This statement shall be rendered to the treasurer on or before the fifth day of each month, as to students, and on or before the first day as to other patrons, including departments.

2. The steward shall keep all accounts of his department; shall render to students on or before the second day of each month, an itemized bill, and the student or patron shall settle with the treasurer on the Saturday following, the fifth day of the month.

3. The treasurer shall receipt to the student or patron, and promptly certify the payment to the steward. The steward shall also certify to the board of audit on the first day of each month a pay roll for all help in his department, which, when properly audited, shall be paid by the treasurer upon the written order of the steward. The steward shall require bills in duplicate for all purchases, one of which shall be kept on file in his office, and the other he shall file with the auditing committee for audit.

4. The accounts of the boarding department in the treasurer's office shall be kept in a set of books distinct and separate from the present books of the treasurer, and all the expenses of keeping said accounts shall be paid from the income of said department.

The steward's committee finding that the cooking apparatus and other kitchen equipment, needed to be largely increased in order that the department might be run with economy, asked and were given authority to make such purchases as they and the steward might deem necessary. An improved twelve foot range with appropriate cooking conveniences, dish washer of large capacity, and a numerous list of other utensils and appliances required for the thorough equipment of the department were bought and paid for from the steward's funds.

At the close of the year the steward's committee reported the following as the receipts and disbursements of the department:

RECEIPTS.

Cash on hand December 1, 1892		$ 995.68
Cash received from students and others during the year		29,479.55
Total		$ 30,475.23

EXPENDITURES.

Purchases of utensils and provisions and other expenses paid during the year	$ 30,474.56	
Cash on hand November 8, 1893	.67	
Total	$ 30,475.23	$ 30,475.23

ASSETS.

Amounts due the department including invoice sold E. R. Benton	$	521.12
Provisions on hand		165.46
Total	$	686.58

Of this sum it was deemed that $425 was practically available for the payment of outstanding bills.

The committee found the liabilities of the department to be as follows:

Outstanding bills	$	1,047.64
Salary of steward during vacation, to February 1, 1894		273.34
Total	$	1,320.98
Deduct amount estimated as now available for payment of bills		425.00
Balance	$	895.98

In arranging to meet this balance the Board ordered that $600.00 should be temporarily borrowed from room rent deposit account, and the remainder from the diploma fund, received from graduates, of which there is now on hand about $700.00.

The want of sufficient funds to meet the bills without borrowing from other accounts, is explained by the steward, as follows:

1. The purchase of additional equipment amounting to about $1,000.00. This is, of course, on hand, and can legitimately be charged to the account of the new year and credited to that of 1893.

2. The week's absence of students at the World's Fair cost the department $500.00. The receipts fell off $800.00, while the expenses of help were not diminished.

3. The charges for the winter school of 1892–3 were so low as to entail a loss upon the department of nearly $500.00.

To avoid further danger of loss from this last source the committee entered into a contract with E. R. Benton, to operate the College boarding department during the present winter school, without cost to the department. He is permitted to charge $3.00 per week.

Upon the recommendation of the steward's committee it was ordered by the Board:

1. That Steward Anderson and wife be re-employed for the ensuing year; salary to be $1,200, $200 of which shall be contingent upon the steward's department being so administered that it shall close the business of the College year out of debt. Mr. Anderson accepts this proposition.

2. That the rate of board be uniformly $2.25 per week for all students.

3. That the chairman of the steward's committee make monthly examination of books and condition of this department; that he supervise general purchases, and that no extraordinary purchase be made without his permission.

4. That the experiment station, now in charge of the vegetable garden, be instructed to provide all vegetables desired by the steward's department at the lowest wholesale prices in this region.

Arrangements were also made for the steward to procure his supply of table butter from the College creamery, provided the price is reasonable, and his fruit, during the fruit season, from the horticultural department, on the same conditions.

DEPARTMENT OF FIRES, LIGHTS AND INCIDENTALS.

This was established as a separate department December 1, 1892. The work included in it was assigned as follows:

1. The professor of mechanical engineering was given charge of the heating system of all buildings heated by steam, the water supply and plumbing.

2. The electric lighting system was placed under the charge of the professor of electrical engineering, including dynamos and circuit; the mechanical engineering department to furnish and have exclusive control of the power therefor.

3. It was made the duty of the steward to supervise the cleaning of the College building, dormitories and boarding cottages, to provide for the care of water closets, inspect the rooms of students and require that each one be kept in a neat and orderly condition, and see that the halls are swept each day and kept clear of all dirt or rubbish of any kind.

4. The president was authorized to place the various other buildings in charge of the heads of departments subject to his direction or, where he may deem it expedient, parts of buildings in charge of other suitable persons. He shall appoint janitors and other employes about the various buildings upon the recommendation of the heads of the departments or other persons to whom he may have entrusted the care of said buildings. The president was given direct supervision of the care of the chapel and the grounds immediately surrounding the buildings.

Having thus provided the machinery for the control in a practical and economical manner of the heating, lighting and care of the dormitories and public buildings, the Board directed that the charge against students rooming in the main building and creamery, for fires, lights and incidentals, be fixed at eighty-five cents per week; against students rooming in the boarding cottages at seventy cents per week;

and that students outside of College buildings be charged a janitor's fee of $5.00 per term, to the end that the income thus derived might more fully cover this class of expenses and leave the resources of the College free to meet the growing demands in the lines of instruction and apparatus, arising out of the increased College attendance.

The financial results for the year under the new system of management, though in many respects satisfactory, show that it is still necessary to devote to the maintenance of the public rooms some $1,250.00 annually of the College support fund. It is hoped that during the coming year new economies may be introduced and this amount lessened. To this end an analysis of the account was ordered and is here given. It shows the sources of income and the different lines of expense:

ANALYSIS OF FIRES, LIGHTS AND INCIDENTALS ACCOUNT FOR 1893.

RECEIPTS.

Cash balance Dec. 1, 1892, including bus department credit		$ 326.44
Old accounts afterward collected—		
Personal accounts as per treasurer's balance sheet	$ 11.16	
Creamery, balance due	75.00	
Experiment station, balance due	25.00	
Main building, balance due	40.39	
Mechanical department, balance due	16.75	
Morrill hall, balance due	116.00	284.30
Old material sold—		
Lead and sash		26.00
		$ 636.74
Deduct: Old bills paid—		
Creamery, for coal and water	$ 135.00	
Freight	12.18	
Total	$ 147.18	
Bills for boarding department improvements, ordered charged to bus department balance—		
Dish washer	300.25	
Tables	27.18	
Desk	17.00	491.61
Balance available to meet expenses of department.		$ 145.13
Income from students and others rooming in college building, rate 85 cents per week		9,025.83

Janitor fee paid by students rooming outside of college buildings, $5.00 per term—		
Spring term	$ 288.50	
Fall term	411.00	
Total	$ 699.50	
Less amount refunded	57.25	642.25
Total income of department		9,813.21
Amount paid by College for heating and lighting public rooms for 1893		1,250.00
Total		$ 11,063.21

EXPENDITURES

For main building, engineering hall, Morrill hall, agricultural hall, chemical and physical laboratory, dormitory rooms in creamery building, and water supply station:

Coal—		
673.02 tons at $2.25 at Boone	$ 1,514.30	
474.38 tons at $2.00 at Boone	948.76	
23.40 tons at $3.30 at Collage	77.18	
137.20 tons at $3.75 at Ames, mostly Squaw creek coal	514.51	
Freight	710.33	
Hauling	308.27	$ 4,073.35
Heating boarding cottages—		
Wood at $3.75 and $4.00 per cord	$ 403.37	
Sawing wood	56.62	
Coal at $2.92 and $3.17 delivered	68.85	528.84
Labor—		
Fireman at main building, rate $53.00 per month for day and evening work; total paid	$ 467.96	
Deduct amount received for work done for other departments	155.35	312.61
W. H. Tripp, engineer at electric light station, also employed in plumbing and keeping in order the steam heating and water supply plants, rate $84.00 per month for day and evening work; total paid	754.69	
Deduct amount received for work done for other departments	207.50	547.19
John Johnson, pumping and firing electric light boiler, rate $54.00 per month for day and evening work, including Sundays; total paid	521.42	
Deduct amount received for work done for other departments	6.80	514.62
Fireman at creamery, rate 15 cents per hour		234.38

Firing for heating engineering hall and chemical and physical laboratory, rate 20 cents per hour.			146.92
Electrician, keeping in order electric light line, rate 15 to 25 cents per hour			117.53
Work on repair and improvement of plumbing, steam heating, water-works and electric light power plants, rate 15 to 20 cents per hour			293.37
Janitor service—			
Main building—			
Cleaning building before opening of College		$ 165.39	
J. D. Quick, janitor, 8 months, 22 days, at $40.00 per month		350.09	
Charles Lyons, cleaning around building, assisting janitor, running delivery wagon, etc.—			
Two months, 4 days, at $35.00 per month	$ 75.00		
Six months, 11 days, at $40 00 per month	254.66		
Boy, 3 months, 1 day, doing chores and running delivery wagon	32.50		
	$ 362.16		
Deduct receipts from College railway for running delivery wagon ($74.00), over and above cost of keeping horse and repairing harness and wagon ($48.86)	25.14	337.02	
Students taking care of recitation rooms; rate, 10 to 12 cents per hour		$ 43.63	
Students in charge of bath rooms.		44.41	
			940.54
Cottages and creamery--			
Cleaning building before opening of College		$ 36.96	
E. Williams, janitor, 8 months, 23 days, at $40.00 per month		351.42	
			388.38
Engineering hall—			
D. Ives, janitor; rate, $45.00 per month			345.51
Chemical and physical laboratory—			
John Baughman, janitor			301.00
Thirty-five dollars per month of his wages charged to this account.			
Morrill hall—			
T. Crites, janitor and fireman			462.54
Rate, spring term, $45.00 per month.			
Rate, fall term, $40.00 per month.			

Agricultural hall—			
D. B. Stanton, janitor; rate, $45.00 per month			36.33
Supplies—			
Electric light supplies, including lamps, drop cords, etc	$ 346.56		
Pipe fittings, plumbing goods, etc	57.08		
Engine oil, waste, freight, express, telegrams, janitor supplies for engineering hall, etc	69.63		
Kerosene oil for main building and cottages	61.44		
Janitor supplies, including lamps, candles, brooms, etc	133.96		
			668.67
General office expenses -			
Salary, Herman Knapp	$ 92.74		
Clerk hire	15.00		
Coal	11.10		
Stationery, including books, blanks, collection cards, etc	122.50		
			241.34
Distributing the mail to ladies' rooms			13.50
Office building—			
Anthracite coal at $9.50 and $9.75 per ton	$ 160.86		
Wood for guest room	19.00		
Three stoves including setting up	119.60		
Lamps and oil	31.50		
Janitor	188.88		
Supplies, repairing furniture, etc	44.95		
			564 79
North hall—			
Anthracite coal	$ 84.98		
Wood, including cutting	140.90		
Janitor	216.48		
Supplies	12.25		
		$	454.61
Total		$	11,186.02
Less amount received from other departments for pumping water			254.49
Total net expenses of the department		$	10,931.53
Balance cash on hand			131.68
Total		$	11,063.21

The following bills are unpaid:

Freight on fuel	$	70.64
Pay roll		90.84
Total	$	161.48

The inventory shows assets as follows:

Accounts due	$	37.49
Wood		212.50
Coal		13.50
Total	$	263.49

Collections and disbursements in this department are made by the College treasurer after the same general plan as in the other College departments. The steward reports to him all charges against students.

AMES AND COLLEGE RAILWAY.

The contract with the Ames and College Railway, expiring January 1, 1893, it was by mutual consent of the parties thereto, extended to July 1, of that year. A contract to terminate July 1, 1895, was then entered into of which the following is a copy:

It is agreed by and between the Iowa State Argicultural College and Farm and the Ames and College Railway Co., that the Company shall receive from the post office at Ames the United States mail for the College and all the departments and the general mail usually received at the College, and deliver the same to the experimental station, post office building, and the treasurer's office, and that said company shall receive the express and packages for the office of the president, secretary and treasurer of the College, experiment station and book department, and deliver the same to said places as follows:

(1) On the first train in the morning after the post office at Ames has distributed the mail. (2) On the first train after the mail received on the noon trains has been distributed. (3) On the first train after the evening mail has been distributed at the Ames post office. (4) On the noon train Sundays.

In consideration of the performance of such services the Iowa State Agricultural College shall pay the sum of $270 per year; the experiment station the sum of $100 per year; the book department the sum of $90 per year. Payment for such services shall be monthly upon filing the proper bills therefor after the same shall have been properly audited. It is further agreed that the year for the delivery for the book department shall be during the school year, beginning the Monday before each term and closing on the last day of the second term, and shall not include the vacations, and the monthly payments shall be so divided that the sum of $90 shall be paid in equal parts during the months school is in session. The packages carried under this contract shall not be deemed to include packages of goods purchased of retail merchants of Ames for private use, nor heavy freight and merchandise for the departments. It is further agreed that during the winter vacation there shall be but two deliveries of mail each week day and one on Sunday. This contract shall begin and be in force from the first day of July, 1893, and terminate on July 1, 1895.

IOWA STATE AGRICULTURAL COLLEGE AND FARM,
By JOHN H. WOOD,
Chairman of the Board of Trustees.
AMES AND COLLEGE RAILWAY,
By J. L. STEVENS,
President.

MATTERS RELATING TO STUDENTS.

The Board at its meeting in June, 1892, made obligatory orations in the junior and senior years a feature of all the College courses. At the same meeting the course in mining engineering, recommended

by the president and faculty, was adopted. The catalogue for 1893–4, as prepared by the faculty, was adopted by the Board at its meeting in July, 1893, with the exception of the proposed omission of French from the civil engineering course, which was not approved.

The charges against students were fixed as follows:

Table board, per week	$2.25
Fires, lights and incidentals, main building and creamery, per week	.85
Fires, lights, and incidentals in cottages, per week	.70
Room rent, per term	$2.00 to 3.00
Hospital fee, per term	1.25

The entire cost to a student entering College, of board, fires, lights, laundry, books and incidentals for the school year of thirty-three weeks will be from $140 to $150, according to the course of study chosen. The expense to students of the higher classes will be somewhat in excess of these amounts, owing to laboratory fees and the greater cost of the books used.

During the past year student bath rooms have been established for which there is no extra charge. They are managed by a board of direction, composed of a professor of the College and a student from each of the four classes, all of whom are appointed by the president. The rules and regulations governing the use of these rooms, adopted by the directing board, have been approved by the Board of Trustees and ordered continued in force. The plan of these bath rooms, in its conception and execution, has proven eminently successful.

The Board, in September, 1892, assigned to the student athletic association a strip of ground northwest of the main building and north of the motor railroad for athletic purposes, and at the annual meeting that year appropriated $200, from interest fund, for its improvement. The president was authorized in the spring of 1893 to use such portion of the public grounds appropriation for the further improvement of these grounds as the condition of that appropriation would warrant.

The College recorder was directed to keep up the student and alumni statistical records and charge the expense to the diploma account.

It was ordered by the Board that all deposits required of students by the College, or any of its departments, should be made with the treasurer.

Trustees McElroy and Shaw were appointed a committee on wages paid students by the College with instructions to report to the Board at its meeting in January, 1894.

The following is the number of students graduating in the different College courses during the biennial period:

	1892.	1893.
In the course in agriculture	4	3
In the course in sciences related to industries	16	20
In the course in mechanical engineering	3	5
In the course in civil engineering	10	5
In the course in electrical engineering	3	5
In the ladies' course	11	10
In the course in veterinary science	10	9
Totals	57	57

Misses Hudson, Parkhill and Starr graduated in both the scientific and the ladies' courses, but in the above they are included only in the first mentioned.

Appropriate degrees were conferred upon these graduates. The degree of Master of Science (M. Sc.) was conferred on Joseph Chamberlain, Edward Eaton, H. A. Gossard, S. A. Beach, Leo Thurlimann, F. A. Sirrine and Mary Nichols. L. B. Spinney, a graduate in mechanical engineering in the class of 1892, received the degree of B. Sc. in electrical engineering.

E. W. STANTON, *Secretary.*

Calendar for 1894.

First Term begins	Tuesday, February 27.
Entrance Examinations	Tuesday, February 27. to Wednesday, February 28.
Recitations begin	Thursday, March 1.
Decoration Day	Wednesday, May 30.
Term Examinations	June 11 to 20.
Junior Exhibition	Wednesday, June 20.
Second Term begins	Tuesday, July 17.
Entrance Examinations	Tuesday, July 17. to Wednesday, July 18.
Recitations begin	Thursday, July 19.
Term Examinations	Nov. 6 to Nov. 14.
Baccalaureate Sermon	Sunday, November 11.
Address before Trustees	Tuesday, November 13.
Commencement Exercises	Wednesday, November 14.
Winter Vacation from November 14, 1894, to	February 26, 1895.

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