RELIGIOUS DENOMINATIONS.

DENOMINATIONS.	Church members	Church preference	Total
Baptist	86	45	131
Baptist (Free)	3	0	3
Baptist (German)	1	0	1
Baptist (St. John)	1	0	1
Bethel	1	0	1
Brethren (Plymouth)	2	0	2
Brethren (Progressive)	1	0	1
Brethren (United)	11	4	15
Catholic	140	11	151
Christian	69	33	102
Christian (Reformed)	2	2	4
Christadelphian	1	2	3
Christian Science	3	1	4
Church of God	2	0	2
Congregational	159	142	301
Congregational (Welch)	1	0	1
Dunkard	1	0	1
Episcopal	64	43	107
Episcopal (Reformed)	1	0	1
Evangelical (German)	5	0	5
Evangelical (United)	3	0	3
Friends	8	3	11
Latter Day Saints	8	2	10
Liberal	0	1	1
Lutheran	41	7	48
Lutheran (Danish)	1	0	1
Lutheran (English)	11	4	15
Lutheran (Norwegian)	4	0	4
Lutheran (Swedish)	5	0	5
Mennonite	2	0	2
Methodist Episcopal	324	212	536
Mission (Swedish)	1	0	1
Presbyterian	208	133	341
Presbyterian (Cumberland)	4	0	4
Presbyterian (United)	15	1	16
Reformed	8	10	18
Seventh-Day Adventist	5	2	7
Unitarian	12	25	37
Universalist	4	8	12
	1,218	691	
Any Protestant Church			88
No preference whatever			28
Statistics not given			27
Total			2,052

Very respectfully submitted,

BERTHA QUAINTANCE,
Registrar.

TWENTIETH BIENNIAL REPORT

OF THE

Iowa State College of Agriculture and the Mechanic Arts

MADE TO

THE GOVERNOR OF IOWA

For the Years 1902-1903

PRINTED BY ORDER OF THE GENERAL ASSEMBLY

DES MOINES:
B. MURPHY, STATE PRINTER
1903

LETTER OF TRANSMITTAL.

IOWA STATE COLLEGE OF AGRICULTURE
AND THE MECHANIC ARTS.
AMES, IOWA, December 1, 1903.

To His Excellency, A. B. CUMMINS:

In accordance with the statute defining the duties of the Secretary of the Board of Trustees of the Iowa State College of Agriculture and the Mechanic Arts, I have the honor to transmit herewith the twentieth biennial report of the Board.

E. W. STANTON,
Secretary.

PRESIDENT'S REPORT.

To the Board of Trustees of the Iowa State College of Agriculture and the Mechanic Arts:

GENTLEMEN—It becomes my duty to make to you for his excellency, Albert B. Cummins, Governor of Iowa, and for the people of Iowa, the following biennial report.

It seems fitting that I should, first of all, make brief reference to the fact that my own incumbency is of such recent date that the greater part of this report will have to do with the affairs of the College under the administrations of my predecessors, President W. M. Beardshear and Acting President, E. W. Stanton.

To the statesmanlike planning, the unselfish devotion, the rare executive ability, and the indomitable energy of the lamented Dr. Beardshear, the present vigorous and healthy condition of the Iowa State College is very largely due. The impress of his ideals and the impetus of his spirit are deeply and enduringly felt. His tomb is appropriately upon the college campus, but his living memorial is the college itself. As one stands within the beautiful and spacious campus grounds, and hears the chiming of the bells and thinks of Dr. Beardshear, who so loved the trees and the sky, and as one feels the eager, thrilling currents of youthful ambition and enthusiasm and gladness, and breathes the atmosphere of this college of the people, his thoughts drift almost unconsciously into the words from the poet Sill, that were often upon Dr. Beardshear's lips:

> "Forenoon and afternoon and night, Forenoon,
> And afternoon, and night,
> Forenoon and—what!
> The empty song repeats itself. No more?
> Yea, that is Life; make this forenoon sublime,
> This afternoon a psalm, this night a prayer,
> And Time is conquered, and thy crown is won."
>
> —*Sill.*

On every hand are the marked evidences also of the thoroughly faithful and intelligent administration of the affairs of the college in the interim since Dr. Beardshear's death. I wish in this connection to record my grateful appreciation of the unselfishness and generous courtesy with which I have been received in my present office.

I am sure that what Dr. Beardshear said in his last report can now be repeated with greatly added significance, "Never in the history of the college could a more favorable report be given of the growth, expansion, and maturing of the educational work of the Iowa State College than for the biennial period just closing." The college has, evidently, come to an era of expansion such as has in recent years characterized the development of several state institutions of our sister western states. The attendance of students last year exceeded that of any previous year, reaching a total enrollment of 1322. This year, up to the present, there are one hundred and fifty more students enrolled than at the corresponding period one year ago. This rapid growth apparently indicates two things, at least. That the college is doing a needed work and fulfilling an important function in the educational field, and that its services to the public are becoming more widely known and appreciated. The Iowa State College is near to the people. It has already, and of right, a place in the confidence and regard of the people, such as many older institutions, particularly in the farther east, are strenuously seeking for themselves. The Iowa State College idea is that education should not be remote from but near to life. The rapid and remarkable development of the group of sciences pertaining to agriculture, the great demand for men capable of an intelligent application of improved scientific methods in industrial affairs, the rapidly extending engineering interests that require skilled direction all serve to make the Iowa State College of Agriculture and the Mechanic Arts a most important factor in the educational and industrial development of the state. The college is fulfilling very accurately the purpose of its founders, as expressed in the original grants and as repeated in the subsequent grants from national and state governments. The legislature of Iowa, in 1858, passed an act to establish "A State Agricultural College and Model Farm." In 1862, the National Congress passed an act and made a grant to "provide Colleges for the benefit of Agriculture and the Mechanic Arts." September 11, 1862, the legislature of Iowa accepted the grant as a

trust fund from the national government for the educational purposes stated in the act. In 1862 the General Assembly passed an act defining the courses of study to be pursued which read as follows, in section 1621: "There shall be adopted and taught in the State Agricultural College, a broad, liberal, and practical course of study in which the leading branches of learning shall relate to agriculture and the mechanic arts, and which shall also embrace such other branches of learning as will most practically and liberally educate the agricultural and industrial classes in the several pursuits and professions of life, including military tactics." Statesmen never planned more wisely than in these legislative acts which have brought into being this school that now stands acknowledged as among the very best of its kind in the world.

EMBARRASSED BY PROSPERITY.

The Iowa State College stands to-day in graver need than ever for the reason that the College has grown much more rapidly than its resources. In the College year 1902-3, the support funds of the College were considerably less than half as much relatively to the number of students as in 1884. That is, if the support fund of the College had grown relatively with the expansion and growth of the institution that fund would now be considerably more than double what it is. Since 1884, the student attendance has increased 425 per cent, and the support fund has increased only 160 per cent. The comparison is still more impressive when we remember that the branches taught have greatly multiplied. The development in the scientific fields of inquiry and instruction have become more complex, interesting and important, and the necessary qualifications and equipment correspondingly greater and more expensive. Laboratory equipment now is a very different proposition from what it was fifteen years ago, and instructors must be specialists, not only broadly educated, but bringing, in addition to well-trained powers of thought, a technical knowledge that prepares each man as he faces a class of students to be an authority in his own field. The Iowa State College has been and is particularly fortunate in the relatively large number of men in its faculties of whom any institution might be proud. These men have, in part, been made by the college, but they have, in part also, helped to make the college. It is inevitable in the near future

that these men will, some or many of them, be drawn away from us to other institutions in other states unless Iowa shall provide more adequate support. We have already suffered somewhat serious loss in this respect. An even more serious result of inadequate support, however, is the overworking of teachers and the overcrowding of classes. In some subjects and classes it does not much matter whether the classes be large or small. It is an actual relative economy in such classes to have a large number of students, but in other subjects. and particularly in field work, laboratory work, clinical work, and in class work requiring personal and careful supervision, the number of students in any one division or class must be limited. Only a certain number can work at a given instrument, as a microscope or transit, and a considerable increase of the number of students multiplies the work of instruction and the required apparatus. This situation has brought about a crisis in some of our departments as will be shown later in the more detailed report. We must, therefore, urge as among our primary and imperative needs a very substantial increase in the support fund.

STUDENT ENROLLMENT.

In 1902 there were graduated sixty five students, as follows: B. Sc. A., 8; D. V. M., 18; B. M. E., 5; B. C. E., 6; B. E. E., 7; B. Sc. in Min. Eng., 1; B. Sc., 7; Women, B. Sc., 13. The College graduated in its regular courses in 1903 eighty-two as follows: B. S. A., 16; D. V. M., 4; B. M. E., 12; B. C. E., 14; B. E. E., 17; B. Sc. in Min. Eng., 2; B. Sc., 4; Women, B. Sc., 13. Making a total of graduates from departments as follows: Engineering, 45; Science, 17; Agriculture, 16; Veterinary, 4. The present student enrollment is as follows:

Academic:	
Engineering	127
Agriculture	67
Science	37
Total	231
Freshmen:	
Engineering	193
Agriculture	60
Science, & G. & D S.	55
Veterinary	30
Total	338
Total enrollment for fall term, 1903, in Academic and Freshman Classes	569

In the classes in mathematics 766 students are enrolled. Several of the classes in mathematics are twice as large as they should be for advantageous work. Classes in analytical geometry should not run above twenty in each class, yet the four classes in this subject now number over thirty each. Any considerable increase will make absolutely necessary additional instructors and it would be absurdly irrational to expect anything else than an increase in the immediate future, at least as great in proportion as in the immediate past. The same situation faces us in the English department, now enrolling 930 students and in some classes running as large as forty-five students. Also in history, enrolling in all 460 students, and in single classes as high as forty. In addition to the work now being done in the English department, in the spring term there will be two composition courses where there is now but one. All the classes are crowded and all the teachers heavily worked. This department must have relief. The same must also be said of the departments of History, Public Speaking, and German. In the department of Physics, there is urgent need of more instructors, and there should be an increase in the salaries paid. There should be two more assistants in the department of Public Speaking. There should be employed an instructor in physical culture for women who can give her entire time to the work. The classes in botany have become so large that one of them is obliged to meet in the chapel. A large addition should be made to the appropriation to this department for assistants and further equipment for laboratory work. The same is true of the departments of Agricultural Chemistry, and Zoology.

It would be a wearisome repetition to go through all the departments with this inquiry, for the story would be the same in them all. Particularly in the departments of Agronomy, Animal Husbandry and Engineering, the demands have heavily increased. Present indications are that with prosperous conditions prevailing throughout the country we may very soon have a total attendance at the State College of not less than 2,000 students. Dean Curtiss estimates that at least 25 per cent increase in support fund will be imperatively needed, and indeed is needed already throughout the entire division of agriculture. This includes the departments of Agronomy, Animal Husbandry, Horticulture and Dairying. The support fund of the College should be increased not less than $100,000 annually. This estimate has been most carefully made upon an exact analysis of the situa-

tion in each department, and is conservative. This addition to our support fund would not then put us on a par with other land grant colleges in this respect. For example, the Pennsylvania State College, I am informed by President Atherton, has aside from the experiment station fund exactly the same support fund as our own college, but their student enrollment is only one-half that of the Iowa State College, and the teaching force is just one-half as large. The courses in the Pennsylvania State College, moreover, are not developed as with us. They offer but one general course in agriculture, and have no distinct courses in dairying or veterinary science.

IN WHAT SHOULD A TECHNICAL EDUCATION CONSIST AND WHAT SHOULD BE ITS AIM?

The primary purpose of a college is to educate men so that they may go out into life clean, strong and earnest. All our courses of study are arranged with this in view. And in a college like ours the technical features receive especial attention. But we do not aim to turn out merely herdsmen and mechanics, but educated men who shall bring trained and cultured minds to bear on the industrial problems of the world. We aim to make our students intelligent as to what these problems are, and we expect them to be qualified for leadership among the hosts of earnest workers in every field of activity. With these ends distinctly before them the faculties have effected a happy union of technical and general culture studies. We do not encourage short cuts to superficial acquaintance with the technical branches of our work. A student needs the mental discipline and the information which comes and can only come with the thorough and patient pursuit of the general science and culture studies. His ability to think clearly, to reason soundly and to free himself from the slavery of mere prejudice, and so to command confidence and respect; his ability to express himself in correct English and his knowledge of the civilization and institutions which he enjoys; his rational self control,—are very largely the result of such discipline as comes from the study of history, literature, mathematics and the sciences. We have to combat the unintelligent demand for premature and superficial specialization.

In this connection it is not inapt to quote a recent utterance of Sir Norman Lockyer, president of the British Association, in an address before that body, when he said that university competition between the world powers is now as potent as competition in building battle ships. He argued that England, though she now has thirteen universities, should have more universities, more professors and better pay, and student fees reduced to one-fifth of the present rates. How are the new universities to be got? "Since 1888," he said, "England has spent £600,000,000 on new ships, to keep its sea power; parliament must vote money for new universities in order to give us adequate brain power, and applying the admiralty principle, we should require eight additional universities, at the lowest estimate, costing £24,000,000 for building and personnel, to bring us abreast of the United States and Germany. And £24,000,000 capital value set apart to increase our brain power, when our present national income is £1,600,000,000, would be the best investment we have ever made." It is also worthy of note that for the first time in the history of this country the great exposition, the Louisiana Purchase Exposition, at St. Louis, is to make education the central feature of the fair, regarding it as the foundation of our civilization.

GRADUATE WORK.

Today, more than ever before, the standing of an educational institution is judged by its post graduate work. Particularly is this the case with institutions like our own, where technical and scientific studies invite to so many fields for original investigation. Such original research as strong students may do often adds some real contribution to the literature and knowledge of the subjects treated. It is therefore a matter of very great encouragement and gratification that we now have a much larger number of post graduate students than ever before. They are classified with reference to their major subjects as follows: Agronomy, 5; Animal Husbandry, 5; Agricultural Chemistry, 3; Horticulture, 1; Dairying, 2.

EMERGENCY HALL.

"Emergency Hall" is rightly named, for it is the cause as well as the result of emergency. Its walls are unplastered and its rooms are narrow and noisy. At times during the day no less than six hundred students gather in the main hall preceding class hour, unavoidably making much confusion and disturbing classes in session. The classes reciting in emergency hall have

a total enrollment of 2,979. The efficiency of the work is thereby crippled, and the wear on the patience and energy of the teachers as well as students is great. We must get out of "Emergency Hall" and into the new central hall now building at the earliest possible moment. This new structure is moving forward as fast as the funds are available. At the earliest, the building cannot be completed until the autumn of 1905. The proceeds of the fund then available will have been used, and no more will be available until the next spring, and the heating, plumbing, lighting and furnishing cannot proceed for another entire school year unless the present legislature makes a special provision for these last mentioned items. A special appropriation at this time for this purpose is the more reasonable, not only because contracts should be let soon for the heating, plumbing, lighting and furnishing, that the "roughing in" may be done as the building progresses, but also for the reason that the further proceeds of the millage tax already granted for building purposes will be no more than sufficient to erect the new agricultural hall contemplated in the original bill.

The following estimate of cost of heating (interior equipment), plumbing, lighting and furnishing, of the new central hall is furnished by Prof. Bissell and by Architects Proudfoot and Bird.

Furnishing	$40,000
Heating	22,000
Lighting	5,000
Plumbing	6,000
Total	$73,000

Two years ago our board of trustees asked for an appropriation of two hundred and ninety thousand dollars ($290,000.00) for the purpose of rebuilding main hall. It is the policy of the state to carry no insurance, or rather to carry its own insurance, and the amount of appropriation necessary to make the College good for the loss by fire should not be considered in the light of appropriation in the line of farther development of the institution. The legislature appropriated thirty-five thousand dollars, ($35,000.00) of the amount asked for, to be used for the foundation of the new hall, leaving the balance necessary for its erection to be derived from the one-fifth mill tax. This millage tax has been regarded throughout the state, and was evidently regarded by the legislature authorizing its levy for this

purpose, as aid for entirely new buildings and equipment in the line of the further development of the College. We would now respectfully urge the additional appropriation at this time of an amount sufficient to place in the new main hall the heating fixtures, electric light fixtures and plumbing. Also for furnishing the offices, laboratories and class room. This, according to the estimate given, would require at least seventy-three thousand dollars ($73,000.00).

In letting the contract for the new central hall, the Board of Trustees found it necessary to cut down very seriously the proposed building from the plans drawn and approved, because the prices of material and labor had advanced and the lowest bid obtained exceeded by some forty thousand dollars ($40,000.00) the amount that could be appropriated for this purpose from the millage tax fund and still leave sufficient for the erection of a new agricultural hall, as contemplated in the grant of the fifth of a mill tax. Accordingly, the plans and specifications for the main hall were cut in the following particulars, leaving open with the contractor an option for their restoration during the construction of the building.

(For explanation, see plans and specifications.)

Items temporarily cut out that should be restored:

1. Dome, attic story, east portico, four pilasters on the west side and the pediment over the same	$22,000.00
2. Restoration of granite instead of Bedford stone for base and steps	15,000.00
Total reduction by these changes amounting to	$37,000.00

It will be seen at a glance that these modifications and reductions seriously affect the general appearance, durability and untility of the proposed building. It will cut out four very important rooms in the attic story, two of which are greatly needed by the botany department, and would be admirably suited to its purpose for botanical laboratory work. This will seriously cripple the plans of the botany department. Two of the four rooms thus cut out from the attic story were intended for the department of public speaking, and will be needed for that purpose. Most serious of all, perhaps, will be the appearance of the exterior. A glance at the plans will show what it means to sweep from the building that is to stand central upon the Campus, the entire dome and attic story. Its architectural effect will be largely destroyed by this defect. This hall should be a credit

to the state, and an enduring testimonial of the educational ideas of Iowa for her great technical and industrial College. The very presence of such a building as this, if completed according to its original design, will itself be no small factor in the educational influences of this College for the future generations of students that will gather here. This building is to be one of the permanent structures to stand in its position, queen among the group of buildings upon this spacious campus, for a hundred years to come at least. It is not to be regarded as a temporary structure, a second "emergency hall."

We, therefore, respectfully urge an appropriation at this time for the completion of this central hall according to the original design. This would require, as already stated, exactly $37,000.00, for which amount the Board now holds options with the contractor for the restoration of the additions mentioned. This will make a total of one hundred ten thousand dollars, ($110,000.00) for the completion and the furnishing and complete equipment of the new central hall.

A CENTRAL HEATING PLANT.

The time has now come in the development of the College buildings for determining upon a heating system. Prof. Bissell has, at my request, furnished a survey of the whole situation, and a careful estimate of cost, which I herewith submit for consideration:

"I estimate that the cost of a complete central heating plant with tunnels and mains extending to the present college buildings, the new central building and to the proposed new agricultural hall and creamery will be $125,000. The various items of this estimate are as follows:

Building and chimney	$ 40,000.00
Boilers	10,000.00
Stokers	5,000.00
Conveyors	8,000.00
Economizers	5,000.00
Auxiliaries and piping	5,000.00
Engines and dynamos	15,000.00
Tunnels, mains and branches	30,000.00
Contingent	7,000.00
Total	$125,000.00

Should it be advisable to construct only such part of the system as would be required to heat the new central building in

1905, the probable expense thereof, with the building located near the present power station and with only so much tunnel construction as would be required to reach the central building, would be about $75,000.00. with items as follows:

Building and chimney	$40,000.00
Boilers	7,000.00
Stokers	3,000.00
Auxiliaries and piping	2,000.00
Engines and dynamos	10,000.00
Tunnel construction	10,000.00
Contingent	3,000.00
Total	$75,000.00

Should it be deemed advisable to adapt the present power station to heating the central building in 1905 by enlarging the same and installing therein apparatus which should ultimately be transferred to a new power station, the probable expense would be $35,000.00, distributed as follows:

Tunnel construction	$10,000.00
Boilers	7,000.00
Stokers	3,000.00
Auxiliaries and piping	3,000.00
Engines and dynamos	10,000.00
Enlarging building and chimney	2,000.00
Total	$35,000.00

The three estimates above given are hereinafter designated as estimates A, B, and C, respectively.

Of the three estimates above furnished and the plans represented thereby, estimate C should in my estimation receive no consideration whatever unless it be found absolutely necessary to abandon the project of a central heating plant before 1905. My reasons for this statement exist in the fact that much of the work would be of a temporary nature. I have estimated that the cost of the purely temporary part of the scheme and the amount which would have to be charged to expediency and not recoverable as salvage when the apparatus is moved to a permanent location would be from ten to fifteen thousand dollars. This is a relatively large sum. We have in the past spent a great deal of money in enlargement of our power staion to meet the demands upon it, and nearly all of the additions so made have been in the nature of temporary or makeshift additions and will not be productive of very much salvage when the per-

manent plant is installed, except as experimental apparatus for the several engineering departments interested. It should be the policy of the college, it seems to me, from now on, to build permanently and not temporarily in the matter of heating and power plants. If we had had a central heating plant during the past year it would not have been necessary to install the two temporary plants at Morrill Hall and Emergency Hall or the one at Agricultural Hall. These three plants represent an expenditure for temporary appliances of probably $4,000.00. If a central heating plant is not constructed in time to take on the new central building there will be an additional outlay required for temporary apparatus and subsequent buildings and in the course of a number of years we will have run up a very large account for temporary work.

In case temporary provision has to be made for heating and lighting the central building without attaching all of our present building to a central heating plant and doing away with the individual heating plants, and at the same time without spending money for purely temporary apparatus and construction work, the central heating plant could be begun with the idea of locating the power station near our present power station and extending a tunnel and mains from there to the central building, a distance of six or seven hundred feet.

Estimate B gives the expense of this construction in which all construction work and apparatus would be of such a nature as to permit being permanently located and adaptable to the needs of the complete plant.

In my opinion, the most satisfactory solution of the heating problem for the college exists in the building of a central heating plant, as per estimate A.

The location of the power station in such a complete system could be one of several places, all of which are entitled to some consideration. The sites proposed and considered from time to time have been, *First*, near the present power station or in the place thereof; *Second*, north of Margaret Hall and east of the old Sexton House; *Third*, north of the barn yards in the inclosure containing the old pumping station. The latter site has been recommended by the landscape gardener and possesses the advantage of securing gravity returns for the whole campus and being convenient for coal by side-track from the changed motor track as proposed by the gardener. In view of the proposed location of the new Agricultural Hall and the new Creamery,

the second site possesses no material advantages over the first, because gravity returns cannot be secured from the whole campus in either case, and with proposed locations of new college buildings recommended by the landscape gardener the first site will probably be as near to the center of demand for heating as the second. Therefore, the choice would seem to be narrowed down to the first and third. The one at the west and the other at the east end of the campus. For convenience of administration and for access for experimental work for which the power station will be very valuable to engineering students the west end site is very desirable. I am of the opinion that with the plant located at this point gravity returns could be secured from buildings as far east as Margaret Hall and possibly Agricultural Hall. Buildings east of that point would have to be supplied with pumps for the return of condensed steam.

It would seem desirable not to be too hasty in determining between the two sites provided enough money is available for building the complete plant on either site.

Of course if the funds are limited so that the complete plant cannot be installed at present, the west end site would undoubtedly be the proper one. It should be said that the section of tunnel between the present power station and Engineering Hall was put in so that it will become a part of the completed system in any event.

In regard to the broad question as to the desirability of central heating for an institution of this kind, I would say that there is no doubt in my mind that everything considered a central heating system is more desirable than a system of isolated or individual plants. The disadvantage of central heating exists in the loss of heat in transmission. This can be reduced to a small amount by proper insulation of the pipes which is possible where the tunnel construction is used as proposed, but in any event the cost of fuel must be greater for central heating than for isolated heating. A part of the loss, however, is offset by the saving due to the unloading of coal without teaming.

The advantages of central heating consist *first*, in a saving of labor due to consolidation and to the use of mechanical appliances for handling coal and ashes and to higher class of apparatus and machinery which can be used in a large plant as compared with those which must be used in isolated plants. *Second*, cleanliness in the several buildings served, due to the removal

to a distance of all dust of ashes and coal and of chimney smoke. *Third*, the removal of noise and the reduced risk from fire."

I approve Prof. Bissell's recomendation for a central heating plant, the location to be determined after careful canvass of the situation.

AGRICULTURAL BUILDINGS.

The new addition to Agricultural Hall and the new Stock and Grain Judging Pavilion and new Greenhouses are nearing completion. The entire cost of the buildings will be $90,000.00, including equipment.

The Farm Mechanics Building is strongly constructed and admirably well adapted to its purpose. Our new Prof. Zinthec has taken up his class work under considerable disadvantage, but with splendid enthusiasm, and is, with his students, anticipating moving into his new quarters within a comparatively short time. The new Stock Pavilion is nearing completion and will be one of the best of its kind when finished and furnished. The new Greenhouses will be roughly finished during the winter. There are, however, insufficient funds for furnishing these buildings. Bids were advertised for and contracts prepared for their furnishing, but inasmuch as there were not sufficient funds the Pavilion will be left bare in the upper story, intended for important laboratory work in corn judging. The Greenhouses also will be left without cases, benches, tables, lights and heat. The items cut out of the furnishings for these buildings amount to $7,801. This furnishing is greatly need at once.

HORTICULTURAL BARN.

The horticultural department is in sore need of a new barn in which to store the nursery stock for experimentation purposes which must be kept at a somewhat even temperature throughout the winter, also for housing teams, tools, hay, and grain. The importance of the horticultural interests of the state make it very important that this need be speedily met. Iowa has 180,000 acres of fruit. The cost of such a barn with equipment, storage, drainage, and for horticultural museum has been carefully estimated at $5,800.00.

INCREASE IN REPAIR AND IMPROVEMENT FUND.

The Board of Trustees has very wisely called to its assistance the services of Mr. Simonds, landscape gardener, to help in the

further development of the College Campus and in the location of new buildings. His suggestions have been already of great value quite as much by preventing blunders of ignorance as in positive results. There is imperatively needed, however, in the near future, a modest appropriation of money for the planting of trees, grading and laying of roads, sidewalks, etc.

The Repair and Improvement Fund now amounting annually to $18,500.00 is insufficient. Eight thousand ($8,000.00) dollars is needed to finish remodeling the Chemistry Building, and a larger amount than has been available during the past years is imperatively needed for new sidewalks, general repairs, and necessary improvements which do not, and cannot, come under the head of any of the special appropriations made for new buildings. This annual fund should be not less than $30,000.00, and we respectfully ask its increase to that amount. This would be $11,500.00 increase annually.

THE LIBRARY.

The time has passed when a college, much less a college with scientific and technial courses of study, can hope to do creditable work with a meagre library. The literature of science is rapidly increasing. No professor can keep abreast of the age in his own field of study or carry his students forward in their work witnout a somewhat extensive library on that subject. Someone has said, "A modern university is a great collection of books". Certain it is that there can be no university without books, and many of them as well as much current literature. The present meagre appropriation of $1,800 annually for the library could be used for any of our twenty-three different departments and then be but a small appropriation for its library purposes. The estimate of our Librarian, Miss Clark, is an extremely modest one when she says, "The library needs at least $5,000 annually for a support fund exclusive of salaries. A technical and scientific library cannot be developed on less. Technical and scientific books a few years old are out of date. Hence, technical and scientific departments must have late books and a good list of periodicals, and such books and periodicals are very expensive." In addition to the present library force, we greatly need the services of a cataloguer for at least a year and a half to put our library, through its catalog, within easy command of the students.

A fire-proof library building ought to be planned for immediately, not only as security for the library against fire, but for the reason that we very greatly need a larger reading room. It is gratifying that the library is being used more intelligently and more extensively than ever before. The larger use of the library is also gratifyingly due to an incraesed amount of reference work being done in the college. This is the thermometer of higher grade scholarship and is very welcome. But the larger use of the library crowds the present desk and reading room to discomfort. On one afternoon, which was not exceptional, it was reported to me that, for lack of seats, over forty students were standing by the windows studying.

In this connection, it ought to be urged that some commodious and comfortable rest and study room for women should be provided at once. Girls who come to recitations either from the city of Ames or from some distance have absolutely no place to spend the noon hour, or for rest and study between recitation hours. The same is true of the men, though they can accommodate themselves more easily to circumstances than the women.

Prof. Summers occupies the part of Morrill Hall not used for the library, and the crowded condition of his laboratory is another urgent reason for a new library building. Prof. Summers occupied every available inch of space last spring term, which is the heavy term for his work particularly, and his students will be crowded out into the end of the hallways and into the corners and closets before the present year is over. The increase in Zoological laboratory work has been as follows for the years given:

1897-8	64
1898-9	93
1899-00	131
1900-01	190
1901-02	215

There is absolutely no relief in sight except there be more building. A new library building would make it possible either to accommodate the Department of Zoology in the room that would thus be vacated by the library in Morrill Hall, or new quarters might be provided in the library building itself. A suitable and worthy library building, fire proof and adequate for future needs which would be the only wise economy, should cost not less than $150,000, according to the estimate furnished by Architect W. T. Proudfoot.

AN ART GALLERY.

When a new library is built it should include in the upper story a gallery of art. The nucleus of an art collection could easily be obtained at small cost in plaster casts of the world's great statuary and in carbons of great paintings. The educational influence of such a gallery of art at our school cannot easily be over-estimated.

A COURSE IN ARCHITECTURE.

The time will doubtless come and should be anticipated when the college with its basis of engineering courses will place in its curriculum a course of architecture. The architect is becoming more and more an important factor in all building processes. Men see the folly of going on ignorantly in location and construction of buildings, often marring the streets of cities, towns, and country by unsightly structures and wasting valuable ground and material by putting up expensive buildings that are, when finished, but poorly adapted to their intended uses. The Iowa State College should anticipate this growing industrial need and prepare to meet it. Particularly is this the case in that such a course is in most direct line of the purpose of the College as stated in the law, and in that we already have excellent foundation studies for such a course in our engineering courses. The Mechanical Drawing, Structural Designing, and study of materials for building purposes are already taught.

When courses in architecture are introduced we will stand in need of an art gallery for the proper preservation and location of photographic and other illustrations of architecture of different periods. There will naturally grow from such a course a cognate course in the history of fine and decorative art.

A new and commodious library building will therefore meet some very important needs of the college and should not be delayed.

NEW COURSES OF STUDY.

During the past year the courses of study in Agriculture have been revised, making four distinct four-year courses, each preceded by a year of academic work. These courses correspond to the special lines embraced in the Division of Agriculture, viz., Agronomy, Horticulture, Animal Industry, and Dairying. The work in each afford special technical instruction bearing

directly upon that particular work, at the same time supported by such scientific and general collegiate studies as are best calculated to train strong, well-equipped men. This departure from the usual one-course curriculum in agriculture has already met with general favor, and similar courses are being established in other institutions. This development of courses helps very materially to differentiate and define our expanding work in agriculture, and gives the separation and emphasis needful to each main line of education and research.

The work in soil physics, soil fertility, and farm mechanics, has been established during the past year. These lines of investigation are of great interest and importance and are already attracting considerable attention to our College. In the near future this enlargement and enrichment of our curriculum is sure to attract many more students than we now have to the agricultural courses. The Illinois legisture has recently appropriated annually $25,000.00 for this line of work alone. We have been fortunate in securing for the professorship in soils W. H. Stevenson.

RESEARCH WORK IN AGRICULTURE.

Probably no phase of the work done at the College is more wide-reaching in its beneficial effects than the experiment work of the station. This work is so happily related to the educational and instructive features of the College that both are stimulated by their mutual influences. By the bulletin system the results of the experimental work in the various lines of inquiry are disseminated among the people. Requests come daily and almost hourly for our bulletins upon various subjects. During the year not less than 85,000 copies have been sent from this station. The results of the Experiment Station are so markedly beneficial that the Legislature of 1902 made an annual appropriation of $10,000.00 annually to supplement the government grant of $15,000.00 for this purpose. This fund now amounts, from these two sources, to $25,000.00 annually. This amount is altogether inadequate for the work of investigation that should be carried forward in the interests of the important industries of the state.

In addition to the askings for experimentation in animal husbandry and for good roads, the experiment station needs:

For soil investigations	$5,000
For corn investigations	6,000
For horticultural investigations	5,000
For dairy, cattle and creamery investigations	5,000
For poultry investigations	3,000

A BULLETIN EDITOR.

The work of issuing bulletins, together with preparation of photographic and illustrated material of which there is increasing demand, and also the work of sending out information to various journals of the state is a heavy part of the office work of the station. A competent man, if giving his entire time to this matter for all of the divisions of agriculture could accomplish more satisfactory results with greater economy than by the present method which leads to more or less duplication of equipment. Such an editor could popularize, illustrate and make more useful than if left in its technical form a great deal of the valuable results of our experimentation. In connection with this it is desirable that our agricultural students, and those who have special inclination toward agricultural writing should receive elemental instruction in this line with a view to fitting them for profitable positions and making them stronger and more useful men, whether they care to take up journalism as a profession or not. There are published in Iowa alone 925 journals and weeklies devoted altogether or in part to agricultural interests.

For these two lines of work there should be at least two capable men and the expenses of such department should not, with salaries, be less than $5,000 annually. Professor Curtiss suggests that three-fifths of this would properly come from Experiment Station funds, and two-fifths from the support funds of the college.

THE ANIMAL HUSBANDRY DEPARTMENT.

The animal husbandry department, on account of a largely increased number of students in graduate and under-graduate work will have to be materially strengthened in the very near future. The animal interests of the state of Iowa are of such importance that our State College, already standing honorably among the leading institutions of its kind, should not lag behind in progressive work in this field. Iowa has in her dairy herds

1,500,000 cows. From Professor Kennedy, I have the following outlines of important work that should be taken up:

Recogniz ng the importance of the live stock interests of the state, and the demand from the farmers for in ormation concerning the best and most economical methods of breeding, feeding and marketing the various classes of our domesticated animals, we can readily see the need of utilizing more money for investigation in this line.

BEEF INTERESTS.

The beef interests are very important in this state, and are in a rather critical condition at the present time. There is an urgent call for exhaustive work along this line at once. The question of "baby beef" production is attracting wide attention at present. This is a new field for investigation, and one which our station should develop. The influence of feed on the quality of the carcass is another question which has not been ascertained, and is claiming the attention of many of our feeders due to the introduction of so many new feed stuffs rich in protein, which are claimed to produce lean and better marbled meat. Investigations of this kind are expensive. There is also an urgent need for feeding experiments on a large scale to determine the comparative value of the different feed stuffs, the influence of grinding, and the best methods of feeding grains and roughage, the advisability of grinding grain for cattle on grass and a thorough study of the value of silage in beef production. For this line of work alone our station should have at least the sum of ten thousand dollars ($10,000.00) annually.

DAIRY CATTLE INTERESTS.

The dairy cattle interests in the state are very important. At the present time we have one and a half million cows. This interest has been at a standstill during the past three years due mainly to the unusual development along beef lines. The past six months have marked a decided change, as the dairy interests are reviving in all sections of the state. This naturally makes a heavy demand on us for information concerning the best and most economical methods of producing milk. We should be prepared to aid this class of people which will be increasing in numbers from year to year. For this work we should have at least three thousand dollars ($3,000.00) annually.

SWINE INTERESTS.

There is an urge t need for a vast amount of investigation work to be done in connection with pork production. The work must be on a large scale and should involve the feeding of several hundred head annually. The question of forage crops in relation to pork production, the various animal by-products and the different methods of prepairing grain should be studied more carefully. For this work we should have the sum of at least three thousand dollars ($3,000.00) annually.

SHEEP INTERESTS.

This is a line of work which should be encouraged as the average farmer of Iowa does not keep any sheep. We should conduct feeding experiments at the station and do some co-operative work in different portions of the state. For this work we should have at least the sum of two thousand dollars ($2,000.00) annually.

HORSE INTERESTS.

The horse interests of Iowa are vast, as this state leads every other state in the Union in the production of horses. There is an urgent need for investigations along the line of horse feeding. Over one-half the horses marketed are in a half fat condition. This means an enormous financial loss to our farmers each year. There is also a need for a careful study of the rations best suited to the needs of the farm work horse For this work we should have at least the sum of two thousand dollars ($2,000.00) annually."

The above amounts are actually needed and are less than the appropriations made by the Illinois Legislature for the maintenance of her animal husbandry work for the next two years, during which time they receive the sum of twenty-five thousand ($25,000.00) dollars per year.

In recapitulation I would respectfully ask that the following annual appropriations be asked for:

1.	Beef interests	$10,000.00
2.	Dairy cattle interests	3,000.00
3.	Swine interests	3,000.00
4.	Sheep interests	2,000.00
5.	Horse interests	2,000.00
	Total amount per year	$20,000.00

EXPERIMENTATION IN SOILS AND IN CORN BREEDING.

The soil of each state requires special study to know its peculiar potencies and deficiencies. In the state of Illinois, under a law passed by the Forty-second General Assembly making appropriations for such investigation, it has been discovered, for example, that the soils of southern Illinois are very strongly acid. No amount of manure will correct the acidity of the soil, but a very moderate amount of lime dressing will do so. By correcting this acidity of the soil, the desirable bacteria of root tubercles which gather nitrogen can live. It is possible to gather 400 pounds of nitrogen per acre per year by bacteria alone, and therefore at no expense. This is equivalent to that contained in 40 tons of ordinary barnyard manure, and would cost at commercial rate no less than sixty dollars. This is only a single instance of the direct value of such investigations carried forward by competent men, and with adequate means. Similar

striking results have been obtained in the same state in corn breeding. Two per cent increase in protein having been secured adding not less than three cents per bushel to its feeding value. This would add more than $6,000,000 annually to the value of the corn crop of Illinois. A similar increase in value is possible for Iowa. Two per cent on this would nearly support the Iowa State College for an entire year. Increasing the oil in corn one pound per bushel would add five cents to its value for the manufacturer. About fifty million bushels are consumed annually by the glucose factories of one company. This would mean an advance of $2,500,000 on the portion of the crop thus consumed each year. America has taken the lead of the world in certain lines of manufacturing because her men have mixed more brains with the metal they handled than any other nation. There are immense possibilities yet unrealized when our farmers shall have learned to mix more brains with the soil.

ROAD EXPERIMENTATION.

Together with other states, Iowa is being impressed with the necessity of better country roads. Poor and inferior roads entail a heavy and continual loss and discomfort, particularly upon the farmers of the state. While national aid is hoped for, it is probable that the states will have to depend upon their own resources and take the initiative in systematic effort for good roads. The construction of such roads is not only becoming an economic necessity, but is also essential to the type of progressive civilization for which Iowa stands. In mining and manufacturing enterprises, it is found that economy of energy is the greatest factor of success. The agricultural interests of the country have been slow to recognize the very great economic importance of improved roads. There should be education upon this point. Dean Curtiss has furnished this statement of the situation as he sees it from wide and long acquaintance with the agricultural conditions of our state:

The inferior roads of this state entail a very heavy burden upon all classes and particularly upon the farmers whose produce must be marketed at seasons of the year when roads are almost impassable. The construction of good roads is not only an economic necessity, but is essential to the highest type of our civilization. Our present system of road construction is not in keeping with the material progress and development of this state. There is just now a widespread interest in methods looking to a permanent and more economical and intelligent system of road building. A large part of

the tax collected annually for road building is virtually wasted. It is safe to say that one-half the money now expended for this purpose would be productive of equally as good if not better results if it could be expended under a more intelligent supervision. Many of the fundamental principles of successful road building are wholly ignored. These principles need to be thoroughly impressed upon all who have to do with this important work. Fortunately, the last legislature passed a law making the township instead of the supervisor district the unit in road work. This will concentrate the work in the hands of fewer men and make it possible to reach better methods more rapidly.

State and national road conventions are held from time to time at which methods of road construction are discussed in an abstract and theoretical way. These efforts, however, while they serve to create a sentiment for road improvement fail to furnish concrete illustrations and demonstrations of the practical methods of road improvement. There is a feeling on the part of many people of the state who have given this question careful consideration that there should be some plan devised by which the local road authorities and commissioners could come together for a period of careful study and investigation of the problems underlying successful road building in Iowa. To meet this demand it is suggested that a short course of instruction in road building similar to the short course work which this college has given in stock and grain judging be provided and offered each year in June, commencing the week following our annual commencement exercises.

In offering such a course as this, I am sure that we would have no difficulty in securing the co-operation and help of the Road Division of the U. S. Department of Agriculture and their experts. I feel sure that we would also be able to secure the co-operation and assistance of the manufacturers of improved road building machinery.

This course of instruction should continue about ten days during which demonstrations in all of the various phases of road building should be given and samples of roads of the different kinds constructed. A part of the time should be devoted to lecture work and a part to actual demonstration work. I feel certain that a well arranged course of instruction of this kind will attract large numbers of road commissioners from all over the state and that it will be a means of readily bringing about the desired reforms and improvements in road construction.

From the annual report of Acting President Stanton to the Board of Trustees, July 15, 1903, I quote the recommendation upon this subject:—

I believe the College is in position, with the aid of the Legislature, to render the state eminent service in relation to this important subject. If we had sufficient funds to purchase some necessary road constructing machinery, and provide for the regular instruction of our students in agriculture and engineering, these young men would carry intelligent ideas of road building to all parts of the state, and would at once become leaders in the movement in favor of better roads. Many of them would doubtless be put in charge of the road work in their local communities. And aside from this means of exerting an influence for better and more economical road construction, I believe that we could establish a short course in road work covering a period

of a week or ten days in the month of June, immediately following the close of the College year, with special reference to teaching township and local authorities in charge of road work in practically all parts of the state. I feel certain that a course of this kind will be popular and well patronized and meet with similar approval to the short course work which we have been giving in stock and grain judging during the winter vacation. Another reason in favor of taking up this work is that we are in need of a better class of roads and work of more permanent construction on the college grounds. This was particularly emphasized by Mr. Simonds, the landscape gardner, who was employed by the college last spring. With some funds at our disposal for the purchase of machinery and for conducting investigations and giving demonstrations along this line, we could construct some permanent macademized roads on the college grounds each year. The work in road construction and investigation, however, should include a careful study of all kinds and conditions of roads, and the best means of solving the road problem in all sections of the state. An appropriation of not less than $5,000 annually will be required for carrying on this work in road construction, and investigation. The facilities which will thus be placed at our disposal will also serve the purpose of instruction for our regular students.

Prof. Marston, in behalf of the engineering departments, says:

I would also ask that the legislature be asked for a special appropriation of $5,000 for the purchase of road apparatus and the establishment of a Summer Good Roads School for the benefit of the road supervisors and other county officers of the state. This school could be under the joint auspices of the civil engineering and agricultural departments, and its suggestion is due to Prof. Curtiss. A regular course of instructions in road work could be given, and model roads constructed. I believe such work would be a great success.

AN ENGINEERING EXPERIMENT STATION.

While Iowa is primarily an agricultural state, it must not be overlooked that we have very extensive manufacturing and mining interests. It will doubtless be a matter of surprise to some that the percentage of population in Iowa living in incorporated cities and towns is quite nearly half the population of the state, and that the rate is quite rapidly increasing. There are 681 towns and cities in Iowa with a total population of 971,215 in 1900, or 43.5 per cent of the population of the state. This entire population particularly is interested in the problems concerning pure water supply, sewage disposal, sanitation, lighting, architecture, etc., problems which the civil, mechanical, and electrical engineers are seeking to solve.

Moreover, in mining interests alone, Iowa has an annual output of fifteen million dollars. Her railroads cost approximately $239,584,000 and the value of her manufactured products annually

amounts to the enormous sum of $164,618,000. The valuation of Iowa's manufacturing industries was, in 1900, $440,770,000.

A factor that should not escape our attention is that these interests are largely controlled by men of unusual ability and of great influence, and they are quick to appreciate that which may prove advantageous to their business interests. The Iowa State College of Agriculture and the Mechanic Arts has, or should have, it within their power to serve these interests in a most substantial way, and with our corps of competent engineers, recognized as standing among the leading engineers of the country, the service can easily be rendered to the lasting benefit of the College itself in such research work and its strengthening in the active interests of a very influential body of our citizens, and to the enduring honor of Iowa among her sister states and in the world.

I therefore submit with my most earnest endorsement, backed by every other department of the College—for in this as in all other of these matters, there is perfect understanding and agreement—the prayer of Prof, Marston, who voices the request of the engineering departments, for an appropriation to establish an Engineering Experiment Station:

PRESIDENT STORMS:

In accordance with your request, I present herewith additional explanations regarding the united request preferred by all the engineering departments of the College that the Legislature be asked this winter for an annual appropriation of $15,000 for establishing here an Engineering Experiment Station.

It is planned to do for Iowa cities and for all the mechanical industrial interests of the state, and in the investigation of all other Iowa engineering problems, work corresponding closely to what the Agricultural Experiment Station is doing for the agricultural interests. In the past, perhaps no single feature of the College work has been so valuable to the state or brought the College so closely in touch with the people as this experiment station work. But no state can reach the highest development in these days without keeping up in the mechanical and technical development also, and it is our great opportunity now to undertake this work for Iowa, by establishing an Engineering Experiment Station.

MAGNITUDE OF THE INTERESTS INVOLVED. (In 1900).

MANUFACTURING.

The assessed valuation of Iowa's manufacturing industries was $440,770,000.

The annual value of manufactured products was (as compared with $365,412,000 for farms) $164,618,000.

The capital invested was $102,733,000.

Laborers, 58,553, representing a population of perhaps 250,000.

MINERAL INDUSTRIES.

I have at hand no means of ascertaining the total capital or assessed valuation, which must be very large.

The value of the annual products alone is about $15,000,000 and a large population is engaged in the work.

RAILROADS (Jan. 1903).

There are about 38,000 employes, representing a population of about	190,000
Mileage	9,724.8
Cost	$239,584,000.00
Annual earnings, for 1902	56,466,305.17

CITIES AND TOWNS.

Number	681
Population	971,215
Per cent of population, 1900	43.5
Per cent of population, 1890	36.4

I have no means of ascertaining the wealth of the cities, but it is evidently a very large percentage of the total wealth of the state.

Besides the above interests, our work in roads and bridges, in drainage, in sanitation of dwellings, and in other lines which necessarily must be directed by engineers, is of direct interest to the rural population.

What we propose to do. We propose to investigate in

Manufacturing:
- Undeveloped resources of the state.
- Mechanical equipment, including power, economy, etc.
- Statistics, and general useful information.
- Special problems submitted by manufacturers, etc.

Mineral Industries:
- Quality of Iowa coals, stone, brick, etc.
- Quality of clay, cement, materials, etc.
- Power plants, mechanical equipment, possible economics.
- Special problems, etc.

Railways:
- Cost of transportation, possible savings, state control here and elsewhere, and other questions of interest to all the people of the state, taking up engineering questions not solvable by Railroad Commission.
- Possibilities for inter-urban lines, cost, etc.
- Questions of direct interest to employes.
- Engineering and mechanical problems in railway location.
- Maintenance and operation, etc.

Cities:
- Paving statistics, specifications, plans, etc., with tests.
- Waterworks statistics, specifications, plans, etc., with tests.
- Sewerage statistics, specifications, plans, etc., with tests.
- Sewage disposal, investigations, workings of plants, general conditions, etc.
- Sanitation, regulations, faults, best detail, etc.
- Taxation, amounts raised, amounts used for each purpose
- Municipal government, etc.

Roads and Bridges:
- Cost of travel on different roads.
- Amount of trafic on country roads.
- Money now expended on roads, and possible savings.
- Methods of construction of roads.
- Cost of roads of different types.
- Culverts, size and plans.
- Bridges, cost, specifications, manner of letting, etc.

Drainage:
- We propose to treat this from the purely engineering side, leaving the cultural side to the Agricultural department.
- Cost of drains.
- Methods of construction.
- Sizes required in Iowa, as shown by tests and past practice, etc.
- We further wish to establish

Laboratories:
- To which any manufacturer, miner, quarryman, clay worker, railroad, city, etc , can send material to be tested, water or mineral to be analyzed, and to which they can refer any scientific or technacal question which comes up in their work.

The demand for such work as the above has been growing for several years. Already, though greatly hampered by lack of means, we have made many investigations, and published several bulletins. This work has helped to inspire and employ our students, and is very favorably received outside. We receive frequent requests for bulletins and have recently made tests for Fort Dodge, Cedar Falls, Marshalltown and Callender.

We receive many requests for bulletins, and promises of support. In fact, the college has for several years secured support for its other askings by making what amounts to promises along these lines. I believe we can secure wide and effective support for our request this winter, which, if granted, would enable us to make an effective start in the proposed work. I believe

that a moderate amount expended in inaugurating it will yield larger returns than the same amount expended in any other way, to the state and to the college.

To this I add the joint appeal of the Engineering Departments:

The undersigned heads of the Engineering Departments of the college respectfully call attention to the investigation work of our departments helpful to the state industrial interests and request that the board of trustees ask from the next legislature a continuing appropriation of fifteen thousand ($15,000) per annum for the establishment of an engineering experiment station at this college.

The importance of this investigation work to the state and to the college cannot be overestimated, and it is well illustrated by the single item of clay investigation, only one out of many possible. The work already done by the college in this line, though necessarily imperfect and spasmodic for lack of means, has secured the heartiest appreciation and support of the clay interests of the state, which would cordially and effectively support an appropriation such as is asked.

Similarly the mining and manufacturing interests of the state can be served by the college, and already the interest and support of the cities of Iowa are being secured by our work in sewage disposal, pavement and waterworks investigation. Our good roads investigations are of the utmost importance to the agricultural, and in fact to all the interests of the state. We receive many requests for our bulletins, and many expressions of appreciation for our work in these lines from all over the state, and suggestions are made to us of still other lines of investigation. In fact, this work can be indefinitely extended, and will put us in the closest touch with those industrial interests which the Morrill law intended us to serve.

We therefore repeat our request that the college ask of the next legislature an appropriation of fifteen thousand dollars ($15,000) per annum for an Engineering Experiment Station here, and suggest that in framing this bill the law making the appropriation for the Agricultural Experiment Station can be taken as a model."

The Iowa League of Municipalities in its October meeting, 1903, passed, unanimously, the following resolutions:

WHEREAS, The Iowa League of Municipalities, recognizing the vitally important necessity for the construction of permanent roadways, pavements, and other municipal improvements and utilities in the state of Iowa, and of improved methods in constructing and maintaining such roadways, pavements, and other municipal improvements, deems it advisable and necessary that ample and detailed information regarding all proper municipal activities be secured and made available to the cities and towns of Iowa.

Now, therefore, be it resolved, that the governors and trustees of our state educational institutions be and are hereby respectfully petitioned and requested to secure and publish in bulletin or such other form as may be deemed proper, the information called for herein.

Be it further resolved, that the general assembly of the state of Iowa be and is hereby petitioned to place at the disposal of such state educational institutions such an amount of money as will be necessary to make such investigations of practical value and assistance to the municipalities of Iowa.

FARTHER STATE AID TO THE EXPERIMENT STATION.

The inadequacy of the amount of present appropriations for experimental work is becoming apparent in view of the opportunities for valuable investigations to be carried on in all lines of agricultural and industrial interests. Some of these important interests have already been referred to. To summarize: The present legislature will be asked to make additional appropriations

For soil investigations	$ 6,000	annually
For corn investigations	6,000	"
For horticultural investigations	5,000	"
For investigations with beef cattle	10,000	"
For investigations with swine	3,000	"
For investigations with sheep	2,000	"
For dairy cattle and creamery investigations	5 000	"
For poultry investigations	3,000	"
For agricultural extension work	5,000	"
For good roads experimentation	5,000	"
Total annual appropriation	$50,000	

For the establishment of an Engineering Experiment Station, as per Prof. Marston's recommendation—an annual appropriation of $15,000.

Sixty-five thousand dollars ($65,000) seems like a large amount and it is, but not relatively large when the magnitude of the industrial interests of the state are considered. If spread in taxes on land alone, it would be but two mills per acre. If laid as a tax on the $400,000,000 of Iowa's annual agricultural products the percentage is so small its computation appears an absurdity. If, to the annual values of agricultural products, there were added the manufacturing and mineral products, the percentage of the cost would appear infinitesimal. As stated by a prominent agriculturist of a neighboring state, such a tax would amount to less than a "nubbin of corn per acre." Our Experiment Station has been very meagerly supported compared with what is being done in other states whose agricultural interests are not as great as those of Iowa. The last Illinois

legislature made the following appropriations for the Illinois Experiment Station:

For investigations in beef, mutton, and wool production	$ 5,000	annually.
For corn work	10,000	"
For Horticultural work	10,000	"
For soil work	25,000	"
For dairy work	15,000	"
Making a total for agricultural investigation alone of	$85,000	"

This appropriation had the support of all the various agricutural organizations in Illinois, and there is already an understanding on the part of the agricultural interests of Iowa that liberal appropriations will be asked for conducting the agricultural investigations of our Experiment Station.

There are now twenty-six of the state experiment stations receiving state aid, in addition to the national grant. The total amount appropriated annually for this purpose is $370,000. Some of the larger appropriations are as follows:

New York	$87,000
Illinois	85,000
Minnesota	42,000
Missouri	26,000
Connecticut	17,300
Louisiana	17,000
Ohio	21,000
Wisconsin	15,000
Texas	15,000

AN AUDITORIUM, ARMORY AND GYMNASIUM COMBINED.

An auditorium is among the pressing necessities of the college. The chapel room in Morrill Hall will not seat one-half the present student body. We have no other room for public gatherings, lecture course, entertainments, commencements, etc. We also greatly need a gymnasium and armory building. Military drill is one of the requirements establishing the land grant colleges, yet it must, on many days of the year, be omitted because of inclement weather and for lack of an armory. We have no suitable place moreover for storing and caring for arms with the inevitable result that they are often rusty and illy kept. If the example of other state institutions should be followed and a large armory built it could be also used for a gymnasium, and

also, temporarily, until a more suitable auditorium could be built, for public gatherings, being seated with movable chairs for that purpose, or an auditorium with armory and gymnasium on the ground floor. A gymnasium, is a recognized necessity in all progressive institutions. No class of students more need the systematic and exhilarating physical exercise of the well-equipped gymnasium than the boys who come from the country where they have had, all their lives, abundant freedom and exercise. Too close confinement and application to study very often results in serious impairment of health. No age ever needed to heed the injunction of the Greek motto,—"A sound mind in a sound body", more than this age of science, intellectuality, strenuous enterprise and nervous tension. Iowa owes it to the fifteen hundred of her sons gathered at the Iowa State College to furnish them an adequate gymnasium and armory building. Such a building would probably cost not less than $100,000.

A BUILDING FOR DOMESTIC SCIENCE AND WOMEN'S GYMNASIUM.

The department of home economics now occupies small rooms in the rear of Margaret Hall. The quarters are crowded, dark and difficult of access. Domestic science and domestic art are receiving much attention elsewhere and the interest in this work is growing in our state. The demand already overtaxes our accommodations and the rooms occupied for this purpose are needed for other uses. Margaret Hall is filled to its utmost capacity and more dormitory room is needed for young ladies. The girls' gymnasium in Margaret Hall is altogether too small for the physical culture classes. A women's building to accommodate the classes and laboratories for Domestic Science and for a women's gymnasium is very greatly to be desired.

A VETERINARY BUILDING.

A veterinary building is among the needs of the College. The prospective outlook is very gratifying in this department of our work. Students are coming to us from other states as well as our own. But our present quarters and hospital facilities are altogether inadequate. Cornell University has a veterinary building costing $150,000, and grants for support of this department $25,000 annually. Ohio State University has a veterinary building costing $50,000. The veterinary building of the Minnesota University cost $20,000. Our present veterinary hos-

pital, besides being much too small, is so situated as to make its removal a necessity in the near future. Our College must speedily equip this department or seriously discourage our capable and loyal men engaged in its work and seriously hamper the future development of our College in this important field. No state in the Union has larger animal interests than Iowa, and the demand for competent veterinarians is increasing with the general improvement of the conditions of animal husbandry and the introduction of better methods of breeding and care of stock and of more valuable grades of animals.

THE CREAMERY.

The management of the creamery under existing conditions has grown to be a difficult problem for the reasons set forth in Professor McKay's report. The Creamery Building, as is well known, is a dilapidated structure and entirely inadequate for the present needs, and not at all in keeping with the dairy interests of a state like Iowa. This building was one of the first college creameries erected, and served its purpose in pioneer days, but we have entirely outgrown it and aside from its deficiencies it is an expensive building to maintain and operate and an unsightly structure on the College campus. The need of additional land is equally urgent in order that a good sized dairy herd may be maintained as a means of conducting investigations and giving instruction in dairy herd management and milk production. Investigations and instruction in these lines are almost or quite as important as the process of handling milk after it is produced. Iowa can not afford to do less than is asked for here from the standpoint of her economic interests to say nothing of the interests of such investigations from the scientific point of view. There are two other urgent reasons for securing this land, viz, the establishment of a poultry department in compliance with quite an urgent demand for investigation concerning this important interest which ranks second only to live stock interests of our state, and providing room which is already needed by the Veterinary Department. The veterinary hospital is inadequate and unfavorably situated and it is only a question of comparatively few years until a new hospital will need to be erected with such surroundings as permit of clinic cases being kept in a less conspicuous place on the college campus, and where more room can be provided for this important feature of the veterinary instruction.

Fortunately there are several pieces of land near the College available at the present time, but some of the most desirable of this last is being taken up. The veterinary hospital and the poultry department must be located within easy reach of the College grounds, and the securing of suitable sites ought not to be longer delayed. For the combined needs of the dairy work, the poultry department and the veterinary department we should have at least two hundred and fifty acres more land, which can probably be secured at a cost of $100 per acre. It is not probable that there will ever be a more favorable time than at present and if action is delayed some of the land nearest the College and more desirable may not be obtainable except at a much higher valuation. There has come to be a general recognition on the part of all of the land grant colleges of the importance and absolute necessity of larger holdings of land for the proper equipment of an institution for instruction in agriculture and several institutions are now proposing to purchase land at much higher prices than herein mentioned. In this connection and as a part of this proposition when it is presented to the legislature I concur with Professor McKay's recommendation to ask the legislature for an appropriation of $75,000 for a new Creamery Building. The dairy interests of the state are second to those of no state in the Union, and our state annually manufactures nearly one-fifth of all the creamery butter put upon the markets of our country; $75,000 is probably the least amount that would build a modern, well-equipped and substantial creamery building, suitable to the needs of the College for years to come, and a structure of an enduring and pleasing character and architectural design. A building of this kind should contain a modern ice manufacturing plant and it should be connected with the central heating plant of the College and the power obtained from the electric plant, thus avoiding the necessity of maintaining a separate ice-house and a boiler and engine in connection with the building. This building can then be so constructed and located that it will be brought more prominently into the group of educational buildings on the campus and will present a pleasing view from every approach with no objectionable features.

For furnishing and equipping the creamery, dairy farm and poultry department $25,000.00 will be needed making a total of $125,000.00.

Among the urgent reasons for additional land and the establishing of a dairy farm may be mentioned the constantly increas-

ing price of milk in this locality by reason of the supply taken by the boarding houses in the vicinity of the college and as a result of diminished supply, the increased expense of having milk hauled from the country. It is now costing us as high as forty cents per hundred to have some of the milk delivered at the creamery. This is about one-half the commercial value of the milk and the supply has fallen below the minimum requirements for giving satisfactory instruction to our students.

In the Wisconsin University where the dairy department is conducted under conditions similar to those now surrounding this institution and where it is being necessary to ship milk from outside points, the annual expense of maintaining the creamery department is about $10,000.00. Our creamery has, until recently, been maintained by an annual allowance of $1,000.00, and can be maintained on about that basis if the milk supply can be guaranteed at reasonable prices as would be the case with a dairy farm and herd of about 100 cows, managed by the College. The saving from this source would, within a few years, amount to the price of the farm aside from the greatly improved facilities for the instruction of our classes, both in milk production and in the manufacture of dairy products.

SHORT COURSES IN STOCK AND GRAIN JUDGING.

Our short vacation courses in stock and grain judging have met a felt need and have already become very popular. Three hundred and ninety-four enrolled for the short courses during the last year. Adding these to the enrollment of students in the regular agricultural courses we have, we believe, the largest enrollment of students in both the regular and short courses of any of the state colleges in America. It remains for Iowa to keep the leadership which she now has by generous and wise provision for the future.

DEPARTMENT OF AGRONOMY.

Agronomy is that division of the Agricultural College work which relates to the field and its crops and has to do with investigation and instruction along the lines of (a) Farm management; the application of economic business methods to farm practices. (b) Farm crops; their production, improvement and uses. (c) Soils; their fertility, cultivation and improvement. (d) Farm mechanics; the tools, machinery, buildings, fences and drains of the farm.

The object being to increase the producing power of every acre of land in Iowa through the introduction of better and improved varieties, better methods of handling and using the crops of the farm, better methods of cultivation and soil management, better machinery and better methods of using and caring for it.

There are five principal methods of accomplishing these results.

First—By means of the regular college instruction work.

Second—Through the short courses in corn and grain judging.

Third—Through bulletins, correspondence, and the press of the state.

Fourth—Through attendance at farmers institutes, and other agricultural meetings.

Fifth—Through co-operative work in connection with farmers in different sections of the state.

INSTRUCTIONAL WORK.

The special course of study has been prepared for the agronomy department which went into effect at the begining of the school year. The corn and grain judging work has been taken from the senior year and put into the freshman year. A new course has been added to the agronomy department known as farm mechanics. One term in the study of soil fertility has been added to the junior year. This adds very greatly to the number of classes to be taught and will necessitate additional help.

The agronomy department has assisted in organizing the Iowa Corn Growers Association which meets annually at the Iowa State College at the time of the short courses given in stock and grain judging.

The objects are:

First—To advance the interest of corn growers in securing better methods of selecting and caring for seed corn.

Second—The improvement and development of varieties of seed corn better suited to the different sections of the state.

Third—To encourage better and more thorough methods of cultivation.

Fourth—To hold conventions for instructions in corn judging.

Fifth—To issue certificates of qualification to expert judges of corn.

Sixth—To publish for the benefit of its members all matters of interest pertaining to corn.

Seventh—To aid in the organization of local clubs for the study and improvement of corn.

To this end the agronomy department is also co-operating with the World's Fair Commission and with the Iowa Grain Dealers' Association. The World's Fair Commission for Iowa of which the Hon. W. C. Whiting, of Whiting, Iowa, is chairman, and Geo. S. Forest, of Miles, Iowa, is superintendent, has purchased a hundred bushels of Reid's Yellow Dent corn for distribution among the farmers of the state.

Over 3,000 two-pound packages of the corn have been prepared and sent out under the direction of the department. Mr. A. E. Cook, of Odebolt, Iowa, has offered a trophy to cost not less than four-hundred dollars ($400) to be known as the Cook Challenge Trophy to be given to the person exhibiting the best ear of corn at the Short Courses to be held at the Iowa State College this winter.

Mr. Whiting, in beha.f of the World's Commission, has offered a trophy of like value to be known as the Whiting Challenge Trophy for the best ten ears of corn of any variety.

Wallaces' Farmer, a two-hundred dollar ($200) trophy to be known as the *Wallaces' Farmer* Challenge Trophy for the best ten ears of corn of any variety.

The Farmer's Institute, a two-hundred dollar ($200) trophy for the best corn judging work done by members of the Corn Judging School.

The Iowa *Homestead* offers one-hundred dollars ($100) in gold to be given in such a manner as shall be prescribed by the Iowa Corn Growers' Association.

Members of the Iowa Grain Dealers' Association, the Iowa Seed Company, and many others have contributed to make up the total premium list of over twenty-five hundred dollars ($2500).

These exhibits will furnish an opportunity to make a careful study of corn grown in the different sections of the state both by the short course members and by the members of the agronomy department.

This department desires to express appreciation for the very hearty manner in which the agricultural interests of the state have co-operated in all efforts made to improve agronomy conditions throughout the state and particularly in its experimental work in different localities. The Bulletin No. 68 issued from this department has been eagerly read and widely distributed. The press of the state has shown exceptional interest and has helped very materially in calling attention to the work being done at the College and in disseminating valuable information. The bulk of the correspondence of this department evidences the widespread interest felt in this work—between nineteen and twenty thousand letters having been sent out within the year from this office. Members of the agronomy staff have attended thirty-eight institutes, farmers' clubs and other representative gatherings.

The department of soils is under the competent management of Prof. W. H. Stevenson, of farm crops under Prof. W. H. Olin, and that of farm mechanics under Prof. C. J. Zintheo.

The differentiation of work in the general department of agronomy thus made is already showing marked beneficial results

FARM MECHANICS.

The new department of farm mechanics promises to be immediately recognized as an important feature of our curriculum. Mr. Elwood Mead, irrigation engineer for the United States Department of Agriculture says in a recent letter to Dean Curtiss:

> I have been very much interested in what I have heard about your new building for the study of farm machinery and farm engineering. I believe this will soon be regarded as one of the most useful and promising lines of agricultural education in this country. This belief was strengthened by what I saw in Europe. In Germany where they cut their grain with a cradle and their grass with a scythe they are paying more attention to the proper construction of agricultural machinery than we are, where this has so much to do with our success. There is no such museum of agricultural machinery in this country as in the Agricultural High School at Berlin. While in England, I talked with a number of professors in agricultural colleges and in every case found that they are preparing to do what you have begun.

The new addition to agricultural hall, which is 60x100 feet in size and four stories high, will be occupied by the new department of farm mechanics. The building is of brick and steel, and fireproof throughout.

On the first floor will be a private workshop for the repair of farm machinery for the College farm. There will be also a students' blacksmith shop, and a place for study and operation of farm motors such as gas engines, steam traction engines, etc. On the balcony of this floor will be carpenter shops for students of this department.

On the second floor will be offices for the head of the department, a large lecture room, drafting room, and students' study and reading room. The latter will contain all the periodicals on farm machinery, farm papers, etc. On this same floor will be a large machine operating room for the construction, operation and testing of various kinds of farm machinery. Students are furnished practical training in setting up and adjusting farm implements, such as binders, mowers, corn planters, corn shredders, plows, wagons, etc.

On the third floor machinery not in use will be stored. There will also be on this floor photographic rooms and dark rooms for instructing students in the farm mechanics department in photography. There will also be on the third floor mailing rooms and offices for assistants in the department.

When completed it will be the finest and best equipped building in this country, or any other, erected for the purpose of teaching students farm mechanics.

The department is not only new at Ames, but now in the educational world. The aim of the department will be to make the course thoroughly practical. Students will be trained in the fundamental principles in the line of the construction of farm machinery and enabled to set up, operate and adjust various kinds of farm implements.

Besides farm machinery the department embraces instruction in farm drainage, road construction, irrigation, planning farm buildings, mechanical drawing, carpentering, blacksmithing and horseshoeing.

Considerable experimental work will be conducted by the department. The department is in receipt of a twelve-horse-power engine from the J. I. Case Threshing Machine Co., of Racine, Wisconsin, to be used for instructional purposes. The Winona Wagon Co., Winona, Minnesota, has furnished Prof. Zintheo, head of the department, with a farm wagon that is a complete affair. This wagon with its equipment will be used in experimental work. The wagon contains ten sets of wheels of different heights and different tire widths. These will be used in tests to determine the best kind of wheels to be used on different roads. In the equipment of the wagon there is a steel grain tank having a capacity of 150 bushels. The wagon is also equipped with roller bearings and ball-bearing axles. The purpose of this test is to determine a comparison of draft of roller bearings and the ordinary friction bearings.

The roller bearings were especially manufactured for this test by the Moffet Roller Bearing Co., of Saginaw, Michigan. They are probably the first roller bearings to be used on a farm wagon. The department has been furnished a newly invented Dynomometer which registers maximum and minimum drafts on a sheet of paper and by an ingenious arrangement gives the average draft during the test. The department will also undertake tests of corn planters, seeking to callibrate the plates of various planters to determine their accuracy in planting corn. These tests are all of vital and present interest to Iowa farmers. Each student in farm mechanics is expected to hand in a paper of not less than 1,000 words on one of the following subjects. Not more than two students to write on the same subject. The paper should be accompanied by one or more sets of plans wherever possible.

1. Dairy buildings, best arrangement of; method of construction.
2. Horse barns; best arrangement of.
3. Cattle barns and stall arrangements.
4. Farm machinery storage in Iowa.
5. The farmer's workshop; how should it be arranged?
6. The home building; how should it be arranged?
7. Location of farm buildings.
8. The Silo; various methods of construction.
9. Handy labor saving devices about the farm home.
10. Best arrangement of the farm water supply.
11. Tile drainage; how practiced in Iowa?
12. Various methods of fence and gate construction practiced in Iowa
13. Sheep and hog barns.
14. Poultry houses.
15. The corn planter and its construction.
16. Machinery used in the care of corn crops.
17. The life of the grain harvester and how to extend it.
18. Roads of Iowa; how could they be improved?
19. Irrigation in the United States, past, present, and future.
20. Wells and well machinery.
21. Pumps and their advantages.
22. Windmills and their efficiency.
23. Country bridges and their construction.
24. The advantages of improved machinery on the farm.
25. Drainage legislation needed in Iowa.
26. What is the per cent of land in Iowa not fit for cultivation on account of lack of drainage?

The building referred to is the new fireproof four-story building now being erected for instruction and investigation in farm mechanics and agricultural engineering. This department

promises to be decidedly popular and of great service to the agricultural interests of the state. Iowa's investment in farm machinery is greater than that of any other state in the Union and the Farm Mechanics Department of the College and Experiment Station has already inaugurated some lines of investigation that are sure to result in a great saving as well as greater efficiency and better results in the use of agricultural implements and machinery.

The statistics of the U. S. Department of Agriculture show that in 1830 it required 17¾ cents worth of labor to produce a bushel of wheat. In 1896 this was reduced to 3½ cents. In 1850 the time representing a bushel of corn was 4½ hours. In 1900 it was reduced to 34 minutes. This saving was largely brought about by the introduction and use of improved farm machinery.

ANIMAL HUSBANDRY.

The course in animal husbandry has been so arranged as to mingle the more technical studies with the general science and culture studies through the entire course. The department stands for all lines of work which pertain to the judging, selecting, breeding, feeding, development, care and management of the various breeds and classes of domesticated animals. Realizing the importance of the live stock industry in the state of Iowa everything within our power is being done to equip men for instruction along animal husbandry lines and for the practical management of stock interests. Our herds and flocks have, by careful oversight, become admirably adapted for purposes of instruction, containing almost every recognized market class of animal and good representatives of all the recognized breeds. Some exceedingly interesting and important results are being obtained in the development of new breeds. The advanced students in stock judging, accompanied by their instructor, visited the American Royal Cattle Show held in Kansas City in October 1902, and again in the same month 1903. The obvious advantages of the three days hard work spent at the Cattle Show inspecting and judging stock makes it quite certain that a similar trip will be planned each year as a part of the work of the fall term. The same may also be said of the International Live Stock Exposition held in Chicago. At these expositions some of the best specimens of stock in Europe and America may be seen. In Chicago, also, a visit was made to the Union Stock Yards and a study made of the animals actually passing through the market.

PRIZES AND TROPHIES WON.

Our students who entered the contest at the International Live Stock Exposition brought honor to themselves and to our Iowa State College by winning every first prize offered, also the Spoor Trophy and over half of all the money offered in the contest. Those contesting were Mr. Chas. Gray, of Ames, Iowa, Mr. W. Dinsmore, of Ames, Iowa, Mr. O. B. Newcom, of Odebolt, Iowa, Mr. W. J. Wilson, of Earlham, Iowa, and Mr. W. A. Linklater, of Stratford, Ontario, Canada. Mr. W. Dinsmore also won first place and was awarded the beautiful gold medal called the Zenoleum Medal, offered by the Zenner Disinfectant company, of Detroit, to students preparing the best written report of any specified class of live stock exhibited at the International Exposition.

In attendance at various fairs in the state acting as judges, in making frequent addresses at institutes and conventions and in answering a very extensive correspondence this department is rendering a valued service to the stock interests of the state.

In addition to the instruction heretofore mentioned offered in the animal husbandry course, there have been added certain lines of veterinary work given by Dr. McNeall, and the course has thus been very appreciably broadened and strengthened. Instruction in the elementary principles of veterinary science is much to be desired for agricultural students and it is felt that this is now one of the strongest features of our course, especially for students who specialize in animal husbandry.

DAIRY DEPARTMENT.

The demand for thoroughly competent men for management of the various dairying interests of this and adjoining states of the Middle West has brought into prominence this department. Over one hundred and fifty men have been taking work in the Dairy Courses. Sixty-four of these are regular four year students. The College Creamery is in operation the year round. The work is conducted on a commercial basis, yet primarily for scientific investigation and instruction. The products of our Creamery command a high price on the markets of the United States and England. Butter and cheese are manufactured, util-

izing for these purposes from five to ten thousand pounds of milk daily.

Two short courses are offered, one for butter and one for cheese making, of sixteen weeks each.

HORTICULTURE AND FORESTRY.

The attendance in the horticultural department has increased from 274 in 1891-2 to 365 in 1902-3, or an increase of over 30 per cent.

On the forty acres devoted to horticultural purposes are many varieties of fruit trees and many important experiments are in progress. Approximately one thousand varieties of fruits are being tried. A nursery affords opportunity for studying the various methods of stratification, budding and grafting. About ten acres are devoted to varieties of deciduous trees for the Northwest.

Horticulture, like agronomy and animal husbandry, is a rapidly developing science. There are many important questions seeking answer in this field, particularly in regard to cold storage of apples, plant breeding and in spraying and plant diseases. This department has now on its grounds several hundred seedlings which are being grown with reference to their adaptation to our peculiar soil and climate. It is recognized that the varieties of apples imported from the East and South into this state having proven largely a failure here we must originate our own varieties. The outcome will quite surely be of the greatest benefit to all our people.

According to the census reports of the last decade the orchard interests of Iowa have increased over 200 per cent. The commercial planting is largely confined to the southern half of the state. These orchards are just beginning to bear in quantity and practically for the first time in the history of our state, we have commercial fruit growers who are seriously confronted with the problem of combating insect and fungus enemies. We desire to carry on co-operative experiments at a number of points in this district. This will serve as an excellent laboratory for investigation and at the same time prove a valuable object lesson as to what may be accomplished along this line.

FARM DEPARTMENT.

The College Farm and its equipments of fields, pastures, buildings and live stock constitutes a laboratory plant and

serves the same purpose as laboratory material in other departments, and at the same time affords object lessons and the demonstrations of practices and principles in agriculture that extend beyond the limits of the College. The strength of our farm and its equipments has unquestionably been one of the strong factors in developing agricultural instruction at this institution. The achievements of our students and of the stock exhibited by the College at the last International Live Stock Exposition are now a part of the history of the institution.

The farm in its grain and stock products is largely an agricultural laboratory. Students are brought into direct contact with growing crops and with farm animals. Experiments in Agronomy, Horticulture, Animal Husbandry, etc., are carried on before the students and with their aid. While the farm, as well as the dairy, is carried forward partly on a commercial basis, their primary purpose and use are educational. Our classes in Animal Husbandry have reached a magnitude where it becomes necessary to draw upon the flocks and herds daily throughout the entire college year for educational and illustrative purposes. All this increases the expense of maintaining the farm. Its value for purposes of instruction is thus increased at an increased cost of management.

VETERINARY DEPARTMENT.

The department is making gratifying progress both in numbers of students and in the strengthening of its course. A straight four years course is now required of those desiring the degree of D. V. M. from the college. The requirements for admission have also been raised. Neither the raising of the standard for admission nor the lengthening of the course has, however, served to lessen the number of students. On the contrary the number has increased and we now have, both as to quality and numbers, a much higher and more satisfactory condition than ever before in the department. In spite of cramped and altogether unsatisfactory equipment the department has made marked progress. It is hoped that Iowa will soon care for this important part of its educational work at the Iowa State College in a creditable and worthy manner.

NEW ENGINEERING HALL.

The much needed and desired engineering hall for which Dr. Beardshear prayed and labored, and for which the Board of

Trustees asked not in vain, is now a fact. By the generosity of the legislature and through the farseeing wisdom of those who have planned together for this consummation so devoutly wished, we now have what Dr. Thurston of Cornell declared to be "the finest and best building for the purpose" he had ever seen.

The faculty and students of the engineering departments are conducting, without, as yet, any assistance from the board for that purpose a press bureau for the purpose of disseminating throughout the state information relative to the work being done in engineering at Ames. Each week a short bulletin in the form of a news item has been sent out to every daily and weekly paper in Iowa and most of these have been published. By attendance at the meetings of the Iowa Engineering Society, the Iowa Brick and Tile Association and Good Roads Conventions, also by means of the "Iowa Engineer" published here, the department is seeking close affiliation with the industrial interests of the state.

With the establishment of an Engineering Experiment Station here, for which purpose a modest request is elsewhere made in this report, our College can greatly serve the state and at the same time increase the efficiency in the instructive features of its work.

DEPARTMENT OF MECHANICAL ENGINEERING.

Eleven graduated in Mechanical Engineering in 1903. There are twenty seniors all of whom will probably graduate in 1904. The total enrollment for 1902-3 was 158. Certain courses given in the Mechanical Engineering Department are required or optional in several of the other Departments so that the total number of students receiving instruction in this department for the year is 637.

DEPARTMENT OF CIVIL ENGINEERING.

Within the last six years the attendance in this department has increased more than six fold. In every way the Department is prospering. During the year very valuable results have been reached in brick tests, Iowa waterworks investigations, sewage and sewage disposal, good roads and a magnetic survey of Polk county. The work along the line of good roads has yielded especially valuable results.

DEPARTMENT OF PHYSICS AND ELECTRICAL ENGINEERING.

The total enrollment in the electrical engineering courses in 1902-3 was one hundred and sixty-two. The rapid development of electrical science and the application of electricity to many industrial problems has caused the number of students taking electrical engineering to greatly increase. It is very fortunate and timely that the new hall was completed and partially equipped at this time of increased demand for instruction in electrical science. The equipment and instruction force will both need to be considerably increased in this as in all the engineering departments.

DEPARTMENT OF GEOLOGY AND MINING ENGINEERING.

Geology.—One hundred and thirty students were enrolled in the classes of this department during the last year. The working equipment has been materially bettered by the purchase of three Bausch and Lomb petrographical microscopes, a hundred type minerals, two hundred specimens of iron and copper and bearing rocks from the Lake Superior region, fifty-five thin sections of rocks, the British Association Series of lantern slides, and a considerable number of photographs and miscellaneous specimens.

The department needs additional support for equipment and collections. For instruction and laboratory purposes a reflection goniometer, a pair of calcite rhombs mounted, two hand compasses and two barometers for field purposes and a number of pieces of less expensive apparatus are needed. The collections should be enlarged as fast as funds can be spared for the purpose. All of the collections should be catalogued and relabeled.

Mining Engineering.—Additional equipment and more instructors are needed in this department. Twenty students were classified in mining engineering during the present term. The principal additions to the working equipment of the Department of Mining Engineering are as follows: A Brunton pocket transit, a half interest in a dissolving view stereopticon, apparatus for ceramics and metallurgy, and a complete series of cards and guides for cataloguing correspondence, apparatus and collections.

The department needs additional facilities for the work in ceramics and metallurgy. The gas connections are being in-

stalled. Water, waste, exhaust and compressed air connections should be made at once.

DEPARTMENT OF GENERAL CHEMISTRY.

There has been a great advance in the number of students taking courses in general and applied chemistry. Five hundred and thirty have taken chemistry in the last year. Thirty-five courses in this department are now open to students, of which twenty-five are applied or industrial chemistry. This increase in the work of the department thus indicated is largely due to the transference to the general chemistry section the chemistry of the agricultural courses. No student can now graduate from the College without at least one year's work in chemistry.

DEPARTMENT OF BOTANY.

The fire of August, 1902, which destroyed what was left of the old main building, affected most seriously this department. Nearly all the bacteriological apparatus had to be replaced which has been a serious burden to the Department and still necessitates somewhat larger demands than would otherwise have to be made. Such specimens and material as were saved have to be straightened out and rearranged. Much valuable research work, however, has been carried forward. Papers have been prepared upon weeds and bacteria. The bulletin on grasses has met with general approval by American and European Botanists, high commendation coming from such men as Hackel, of St. Polten, Australia, the greatest living authority on grasses, and Dr. Maynus and Dr. Urban of the University of Berlin.

The herbarium has been augmented by the following gifts: The Andrews collection of 2,500 specimens made in California in 1847, Louisiana, Tennessee, Europe, Brazil and the Samoan Islands; a collection of 800 specimens from the New York Botanical Garden; a collection of some 800 specimens collected by Dr. Pammel and Mr. Blackwood, and many specimens collected in Iowa by members of the botanical staff. These plants are of use in studying problems of geographical distribution, especially as relating to grasses and weeds. The collection is therefore of use not only in studying important agricultural problems, but is of the greatest value to students.

DEPARTMENT OF HISTORY AND PHILOSOPHY.

Three hundred and twenty students took history in the fall term, three hundred and seventeen in the spring term and four hundred and fifty this fall term. The courses offered in history and philosophy have special reference to the needs of the students taking technical courses in the College and are intended to make them intelligent as to fundamental principles in philosophy and the laws of thought, and in history to make them acquainted with the sources and evolution of civilization. Changes in some of the courses of study will add 200 or 250 more students to the history classes. In addition to the work in history proper there should be added one or more courses in civics. It is our purpose to add this to our present required studies in all courses as soon as the instructor can be provided.

DEPARTMENT OF ZOOLOGY.

In addition to the courses previously offered a year in elementary physiology has been added in the last year. The rapid and large increase of students in the department has already been referred to. It is the ambition of the head of this department to establish somewhat closer relation with the high schools of the state by suggestions and directions and correspondence in nature studies to be carried on by high school pupils and their work and collections forwarded here for examination, This, if encouraged, will, we believe, prove of great value to the high schools as well as to the College.

DEPARTMENT OF DOMESTIC ECONOMY.

In spite of somewhat cramped rooms and limited equipment this extremely interesting work of our College has been developing finely. Professor Mary A. Sabin, on account of ill health, found it necessary to resign in August. This has meant a serious loss to us, particularly, as Professor Sabin was presenting the possibilities and needs of this department of our College to the women of Iowa in a way not only to strengthen interest in domestic science, but in the College. In domestic science, or rather group of applied sciences, there is scope for the technical education of women akin to the technical features of our curriculum for men. The department is doing excellent work under the care of Miss Alice Merritt and assistants. During the school

year of 1902-3 there were enrolled in the classes of domestic economy 157 in the fall term and 122 in the spring term. Through Professor Sabin the National Sewing Machine Company, of Belvidere, Ills., has given us a $75 sewing machine and Marshall-Field Company, of Chicago, a very valuable collection of fabrics, laces and embroidery samples. Also from Barbour Brothers, of New York City, an exhibit showing the various products from the flax straw to the linen thread.

The new course in general and domestic science has been carried through for the first time the past year. This course is much stronger than ever before in its history, is very satisfactory in its working and compares most favorably with similar courses in other institutions. The two years short course in domestic science for teachers has also been carried through successfully and is satisfactory in results.

DEPARTMENT OF LITERATURE AND RHETORIC.

The work in English is fundamental in all courses offered. 819 students were classified in English in the fall term and the same number in the spring term of 1902-3. The work is extremely heavy, particularly as the mass of essays and compositions is in the aggregate enormous and requires careful inspection. In accordance with the recommendation of Professor Noble and Acting President President Stanton the Board of Trustees made Miss Larrabee and Miss Maclean assistant professors in English. In the fall our debating team to the credit of the department of English and the department of public speaking and to the great credit of the College won the unanimous decision over the team from the State Normal School. This is the third victory in four years.

DEPARTMENT OF PUBLIC SPEAKING.

Acting upon the recommendation of Professor Newens and acting President Stanton the name of the Department of Elocution and Oratory was changed to that of Public Speaking, more accurately corresponding to the purpose and work of this department.

The relation of the department to the literary societies of the College is most vital and helpful. There has been most cordial co-operation with these societies in arrangement of programs and in personally coaching debaters. A very large number

contested for positions in the debating teams and a great interest in public speaking has been aroused. Under direction of this department the Junior Class Play has become an established feature of commencement week.

It is an evidence of wholesome development in the College that along with vigorous evolution in technical lines there exists a corresponding growth in literary interests as well.

DEPARTMENT OF MILITARY SCIENCE AND TACTICS.

In accordance with the requirements of law military drill is regularly maintained under a competent officer, General James Rush Lincoln. Drill is required of all regular students for two years of their course. This, in some measure, supplies the lack of gymnasium practice and serves to give to our students a dignified and manly bearing and a valuable acquaintance with military tactics. The nation expects her sons who enjoy the benefits of her land grant colleges to be prepared for her defense in time of national danger, and as a matter of fact our college was most honorably represented in the last war by worthy alumni who joined the ranks of our soldiery.

DEPARTMENT OF MUSIC.

The department of music has but a semi-official relation to the college. It is supported almost entirely by tuition fees from students taking private lessons. Yet our college life would seem sadly barren without the cultural influence and the very substantial help in Divine Worship and on public occasions which our musical department offers. Students here, as elsewhere, have increased in a most gratifying way and the Glee Club is doing most excellent work, if not better than ever before.

DEPARTMENT OF FRENCH AND GERMAN.

By vote of the faculty, agriculture, engineering, scientific and domestic science students will be required hereafter to study either French or German. Thus nearly all the students in the college will, at some time in their course, be taking work in this department.

STATION BULLETINS.

In the biennial period, the Station has issued bulletins 59-69, inclusive. No. 59 contains a bacteriological study of the College Creamery milk supply. Reference is made to the facts stated in Bulletin 40 of the Iowa Station and that the market value of butter is determined by its flavor. It is shown that the chief difference between winter and summer butter is not due to the character of the feed given the cows, but to a difference in fermentations occuring in the milk. A series of experiments were made, beginning February, 1900.

On each Wednesday, for a period of a year, beginning at that time, pint samples were taken from the mixed milk of each patron bringing milk to the College creamery that day. After taking a sample, as mentioned, a small measured amount was taken and placed in another jar which was kept in ice and salt. An equal sample from each patron's milk was added to this jar which represented, when complete, a composite or average sample of the milk brought to the factory that day. The College creamery is supplied with milk by farmers of the neighborhood who furnish milk of a quality which is about typical of the milk used at the creameries of the state. Tables are given showing the results of fermentation tests at the end of each week in the year. This bulletin also contains notes on a "Case of Putrid Butter." Investigations are made and the following conclusions reached: The putrid condition of the butter was brought about by contamination of the milk, and not from the feed the cows were receiving. Contamination probably took place before the milk was received at the factory, and could have been checked by the factory operators by using proper methods. The principal difference between the spoiled butter and good creamery butter in regard to the bacteria contained was an abnormal number of gelatine liquifiers in the form which included some forms found to have a very injurious effect on butter. Purification of Milk by Centrifugal Separation is also treated. No. 60 is a summary of references to known facts about the North American Species Aphididæ. Bulletin No. 61 which takes up the subject of "Miscellaneous Notes on Fungus Diseases of Plants, the Canada Thistle and Dandelion," by L. H. Pammel, and "A Few of the Common Fleshy Fungi of Ames," by Alice Ward Hess. The first paper discusses cow pea rust, a new disease that made its appearance in Iowa and the United States in the fall of 1901.

The appearance and disappearance of the clover rust, which a few years ago was a very troublesome fungus disease in Iowa, is also discussed. The common asparagus rust reported in an earlier bulletin has spread to a considerable extent in the state of Iowa, and has become a great menace to asparagus culture. Attention is also called to the dandelion as a pest, and a method of extermination with chemicals is reported, also a method of extermination of Canada Thistle. Miss Hess, in her paper on fleshy fungi, discusses the more common species in Iowa, and their use as a food.

Bulletin 62 is a study of the germination and growth of Leguminosæ, especially with reference to small and large seed, by F. G. Miller and L. H. Pammel. This bulletin makes a record of a large number of tests with light and heavy seed. It was found from experiments that the root systems as well as the leaf and stem development are superior in plants from heavy seeds. It is found, for instance, with reference to clover, that there is very little difference between the germination of small and large seed when we take average results, although in some cases it was found that the large seed germinated much more rapidly than the small and the percentage was greater. It was also shown that the plants from the large seed were uniformly larger and stronger, with few exceptions. No. 63 treats of sheep feeding experiments. Finishing western wethers on grass and grain for early summer market. Farmers throughout the central states annually feed and finish for market thousands of sheep. During the past decade, a great many farmers have adopted the policy of purchasing western lambs and yearlings during the months of September, October, November, and December, with the intention of feeding them from sixty to 120 days, depending upon the condition of lambs, markets, etc., and then selling them at an advance in price sufficient to return a nice profit on the investment. Desiring to obtain reliable data in regard to the economy of finishing lambs for the early summer market, the advisability of purchasing lambs in the spring of the year, and carrying them over on grass to be finished in the fall on grain and hay for the early market and to make a comparison of the relative economy of summer feeding on grass, and grass and grain, versus fall feeding on grain and hay. A bunch of 261 Idaho lambs (yearlings) were purchased on May 1, 1901, from Clay, Robinson, and Co., commission merchants, Omaha, Nebraska, at four cents a pound. The freight from Omaha to Ames added

an additional one-fourth of a cent, making the lambs cost us four and one-fourth cents delivered here. These lambs had been on light feed in Jansen, Nebraska, during the winter months. They were dipped before shipping to eliminate any possibility of scab or other contagious disease. After their arrival they were divided into six bunches, five of which were used in the summer feeding experiment. The remaining bunch, which contained 100, was carried over on blue grass pasture for fall feeding purposes. Tables are given, showing number of sheep, days fed, food eaten, average weight at beginning, total gain for lot, average daily gain, feed per 100 pounds gained, and cost per 100 pounds gained. The data obtained indicates:

1. That sheep will make practically as large gain on grass alone as on grain and grass.

2. That in economy of grain, grass alone gives the best results.

3. That corn at thirty-three cents per bushel is a more economical grain to feed sheep on grass than oats at twenty-two cents or barley at forty cents.

4. That mutton can be produced much more economically during the summer months on grass alone or on grain and grass than it can be produced by feeding grain and hay during the fall and winter months.

5. That the feeder can oftentimes purchase half-fat lambs during the latter part of April or the first part of May and by grazing them for from forty to sixty days realize a good profit due to advance of market prices during the latter part of June and the first part of July over those ruling in April and the first part of May.

In experiments on finishing western wethers for early winter market, the following results were obtained:

1. That when corn is worth forty cents per bushel, emmer is worth twenty-six and one-half cents per bushel of thirty-five pounds for sheep feeding purposes.

2. That when corn is worth forty cents per bushel, soy beans, when they compose the sole grain ration are worth but forty-five cents per bushel for sheep feeding purposes.

3. That corn alone, when fed in conjunction with clover hay produced larger and more economical gains than the ration of corn, two parts, gluten feed one part, and clover hay.

4. That sheep can be fattened more economically on grass and corn or on grass alone than on emmer and clover hay, soy beans and clover hay, corn two parts, gluten feed one part, and clover hay, or corn and clover hay.

5. That soy beans, on account of their high protein content should not form the sole grain ration in conjunction with clover hay for sheep feeding purposes.

6. That, pound for pound, corn is more valuable than emmer for sheep feeding purposes.

7. That mutton can be produced economically on grass alone during the summer months.

No. 64 contains notes on strawberries and gives the results of a variety test of strawberries begun in the spring of 1899. At this time, seventy-five varieties were set in plats ten feet long, and each plat contained two rows four feet apart and the plants twelve inches apart in a row, so that each plat contained twenty plants. The matted row system of culture was used, and the plants were allowed to spread until they formed a row about two feet wide.

Tables are given showing yields of varieties, and also the opinions of strawberry growers of the state.

No. 65 treats of the value of different stock foods and their value when fed in conjunction with corn for the economical production of pork. Tables are given showing the weight at beginning, average value, cost of feed, average weight on Chicago market, selling price in Chicago market, proceeds per hog on Chicago market, average marketing expenses per hog, average net profit per hog. Table is given showing the price per bushel returned by each of the various lots of hogs for the corn consumed; also table giving the analysis of the various feeds used.

No. 66 treats of condimental foods (stock foods) the by-products of corn, flaxseed and cottonseed and dried blood; their value when fed in conjunction with corn for the economical production of beef. The bulletin is designed to be of service to the cattle feeders of the Middle West. For several years past the Station has been in receipt of many inquiries concerning the feeding value and advisability of using the by-products and fundamental foods included in this test. This experiment, conducted on the Brookmont farms, owned by Mr. A. E. Cook, of Odebolt, Iowa, grew out of a visit of Mr. Cook to the Experiment Station last year in quest of information pertaining to this subject. The Experiment Station and the feeders of Iowa have been fortunate in securing the facilities furnished by the Brookmont farms for conducting this investigation. These results are

not deemed final or conclusive, but are presented as data bearing on a most important subject, of vital interest to many feeders who have desired information without waiting for the completion of further tests. No. 67 gives the chemical composition of some food preservatives. There are many substances which are placed on the market, at the present time, intended for preserving food products under various brands and names. The claims made for these substances by the manufacturers would lead one to believe that the brand of substance for which the claim is made possessed wonderful power for preserving food products. When these mixtures are examined it is found that they are composed of common substances and such that anyone could readily prepare for a small part of the price charged for them. No. 68 treats of the selection and preparation of seed corn and has been prepared in answer to the many letters which are being received daily asking for information regarding the purchasing and testing of seed corn and its preparation for planting. No. 69 deals with the chicken mite, as it affects chickens. It gives the bad effects of mite infestation, a description of the mites, means by which mites are introduced into a flock, methods of extermination. The following conclusions are reached:

The chicken mite is one of the worst enemies of chickens in Iowa.

The mites live and breed in fissures about buildings and feed upon the fowls when they go upon the nest or perch. Mites may be introduced into a flock by a fowl or other bearer brought from infected premises.

Mites may be exterminated by thoroughly spraying the building and its contents with kerosene emulsion. Kerosene emulsion kills not only the mites, but also their eggs when it comes in contact with them.

The popular edition of Bulletin 70, published in July, 1903, treats of "Some Weeds of Iowa." During the year, the department of botany receives a great many requests for information on the subject of weeds. These requests come from all parts of the state. Many different kinds of plants are sent in. Some, of course, more frequently than others. Professor Pammel at different times has given accounts of weeds in bulletins of the Experiment Station. Most of these bulletins are now out of print. It seems advisable, therefore, to issue a larger edition to supply the demand for information on this topic, and a popular

edition to contain the methods of extermination with brief descriptive characters is issued. We have likewise included an account of some poisonous plants, inasmuch as several cases of poisoning from cowbane have occurred during the past spring. This bulletin is published to meet the demand for information on this subject. The full edition of bulletin 70 not only contains an account of the more common weeds found in the state, and accounts of cowbane which during the past season poisoned several children in the state, but such other weeds as are frequently found to poison live stock. In addition the subject of dissemination of plants is discussed. It is not only important to become familiar with our common weeds, but the farmer should become better acquainted with the manner in which these weeds are disseminated and scattered. This matter will be of interest, not only to the farmers, but of importance to the school children of the state, who should not only be made familiar with our most common plants but the manner in which the seed is scattered.

We have completed during the year material for the second bulletin on the grasses of Iowa. This work is logically station work, although the material will be published by the Iowa Geological Survey, and will constitute Bulletin II of the Survey. Bulletin II of the Geological Survey will contain descriptions and the distribution of our grasses.

Bulletins 54 and 56 of the Station contain the same matter as found in Bulletin I of the Iowa Geological Survey and are practically exhausted. Requests for this bulletin have come from many of the libraries of the state, and working botanists in all parts of the world.

In addition to these publications, Professor Pammel has contributed to the following journals: Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten on Bacteriological Investigations of the Ames Sewage Plant; the results of our investigations of the bacteria found in the effluent, tank, and manhole of our sewage disposal plant.

In addition, the following contributions of the botanical department have been issued: Contribution No. 19, "The Thistles of Iowa." with notes on a few other species, giving an account of the more common species found in the state, with notes on some of the western types and a discussion of the biological relations of the plants. Contribution No. 20, "The Vascular Cryptogams of Iowa and Adjoining Parts of Southeastern

Minnesota and Western Wisconsin," by L. H. Pammel and Charlotte M. King. This contribution discusses the distribution of ferns. This paper, like the thistle paper, discusses the distribution of an interesting group of plants. Contribution No. 21, "Preliminary Notes on the Flora of Western Iowa, Especially from the Physiological Ecological Standpoint," by L. H. Pammel. The writer discusses the chief ecological factors in distribution of the Iowa flora that is quite peculiar to the western part of Iowa. The paper is illustrated by numerous half tone cuts, showing the features of the flora. Contribution No. 22 takes up the subject of "Some Ecological Notes on the Vegetation of the Utah Mountains in Northwestern Utah." Three seasons' material has been collected for a flora out of that portion of Utah. This flora would naturally be preceded by the physiographical conditions of the region, hence the paper on "Ecological Notes," etc. A subsequent paper will treat of the flora of the Uintah mountains.

Prof. L. H. Pammel and Charlotte M. King have also completed during the year a text-book on the subject of Ecology of some 400 pages.

Many requests come for the identification of plants, and various agricultural papers desire information on botanical topics. Some of these require considerable time in looking up. As these are frequently of general interest, they are answered through the columns of the *Weekly Register*. This puts us in touch with a large number of the citizens of Iowa. The assistants in botany during the past two years have published the following papers: "The Germination of Weed Seeds," by L. H. Pammel and G. M. Lummis; "Phenological Notes for 1901," Charlotte M. King in Horticultural Report for 1901; "Winter Aspect of the Woods," Charlotte M. King, Proceedings Iowa Park and Forestry Association, 1901; "Phenological Notes for 1902," Charlotte M. King, Trans. Iowa Horticultural Society, 1902; "Forest Preservation," Charlotte M. King in Iowa Park and Forestry Proceedings, 1902; and "A Summer Outing," Charlotte M. King in *Plant World*. In all, this amounts to 1,500 pages of printed matter.

GENERAL CONDITIONS.

Considerable substantial improvements have been made within the College buildings and on the College grounds. Notably the chemical laboratory, which has been overhauled and

fitted for general chemistry classes. Acting under instructions from the board of trustees, Mr. Cavell has utilized the debris from the ruins of the old main hall, and cinders from our furnaces, in constructing and improving roadways and footpaths. About sixty rods of brick gutters have been constructed, and a stone road and stone curbing laid in front of Agricultural Hall. The campus and park have thus been very materially improved, and the receipts from sale of material taken from the ruins have met all expenses incurred in the improvements made.

The general health of our large body of students, and of the faculty and their assistants has been excellent. The wholesome condition of the College and environs is attested by this fact.

The moral tone of the student body and of the instructional force is extremely satisfactory. It would be difficult to find so large a number of students with so little that is undesirable in moral character and conduct. Chapel services are regularly attended at noon. On Sundays, representative clergymen of all denominations are invited to address the students, and the uplifting influences from their services are felt to a marked degree. The Young Men's Christian Association and the Young Women's Christian Association are both well organized and well sustained. Voluntary Bible classes meet on Sunday morning, pursuing the four years' course of study outlined by the National Young Men's Christian Association. These classes enroll a very large percentage of the entire student body.

A new association building, to cost $50,000, is assured, and will be erected immediately. Private subscriptions sufficient to put up such a building have been received, fifteen thousand dollars of which is subscribed by the Alumni Association of the College, for the purpose of adding an upper story to the building to be utilized for dormitory purposes during the school year, and by visiting alumni at commencement time. The completion of this building, for which a site has been granted by the trustees, will greatly encourage and facilitate the splendid work being done by the Christian associations. Aside from its more distinctively religious purposes, the association building will contain a swimming pool and baths, a large cafe, and rest rooms for both men and women.

TREASURER'S REPORT.

TREASURER'S REPORT.

The following is a complete statement of the transactions of the accounts for the fiscal year ending June 30, 1902.

Account.	Balance July 1, 1901.		Fiscal Year.		Totals.		Support Funds.		Balances June 30, 1902.	
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Interest on lands belonging to Congressional grant		$11,007.98		$ 633.93		$ 11,641.89		$ 11,641.89		
Interest on accumulated interest				1,227.96		1,227.96		1,227.96		
Interest on investment of endowment fund				36,264.54		36,264.54		36,264.54		
Interest on lands obtained by foreclosure				127.50		127.50		127.50		
State additional support fund				25,000.00		25,000.00		25,000.00		
Contingent principal fund		12,400.00	11,500.00		$ 11,500.00	12,400.00				$ 900.00
Mortgages receivable	$12,400.00			11,500.00	12,400.00	11,500.00			$ 900.00	
Agricultural fellowship		200.00	200.00		200.00	200.00				
Donation fund		128.03		28.80		156.83				156.83
Diploma fund		133.80	272.38	335.00	272.38	468.80				196.42
Room rent		52.43	2,114.29	2,488.50	2,114.29	2,540.93				426.64
Railroad damages		88.00				88.60				88.00
Morrill support fund			25,000.00	25,000.00	25,000.00	25,000.00	$ 25,000.00	25,000.00		
Salaries			20,248.43		20,248.43		20,248.43			
Farm department			17,578.52	13,795.90	17,578.52	13,795.90	3,782.62			
Creamery department			6,292.07	5,298.50	6,292.07	5,298.50	993.57			
Dairy department			1,978.92	1,420.33	1,978.92	1,420.33	558.59			
Horticulture			3,444.53	650.37	3,444.53	650.37	2,794.16			
Chemistry			3,316.24	1,995.07	3,316.24	1,995.07	1,321.17			
Civil engineering			2,982.68	241.86	2,982.68	241.86	2,740.82			
Zoology			1,374.24	679.15	1,374.24	679.15	695.09			
Mechanical engineering			9,617.60	5,290.90	9,617.60	5,290.90	4,326.70			
Phy-ics and electrical engineering			2,050.49	600.60	2,050.49	600.60	1,449.89			
Veterinary			2,050.06	1,191.85	2,050.06	1,191.85	858.21			
Botany			1,677.82	803.19	1,677.82	803.19	874.63			
Musical department			701.54		701.54		701.74			
Contingent expense			9,448.39		9,448.39		9,448.39			
French and German			600.00		600.00		600.00			
Library			3,200.06	2.10	3,200.06	2.10	3,197.96			
English department			2,905.91	21.60	2,905.91	21.60	2,884.31			
Domestic economy			1,712.58	516.25	1,712.58	516.25	1,196.31			
Political economy			4.90		4.90		4.90			
Mathematics			2,524.78		2,524.78		2,524.78			

TREASURER'S REPORT—CONTINUED.

Account.	Balance July 1, 1901.		Fiscal Year.		Totals.		Support Funds.		Balance June 30, 1902.	
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Geology			$303.03	$ 3.00	$ 303.03	$ 3.00	$ 299.43			
Agricultural chemistry			1,558.95	662.96	1,558.95	662.96	895.99			
Public grounds			1,529.65	135.93	1,529.65	135.93	1,393.72			
Sabbath services			451.94		451.94		451.94			
Mining engineering			2,106.70	9.00	2,106.70	9.00	2,097.70			
Public rooms			1,389.69		1,389.69		1,389.69			
Military			99.80		99.80		99.80			
*State appropriations	$ 3.85		112,754.37	113,062.62	112,754.37	113,062.62				$ 308.25
Total	$12,400.00	$24,014.07	$252,900.54	$249,018.56	$265,300.54	$278,027.63	$ 92,890.94	$ 99,261.89	$ 900.00	$ 2,106.14
Balance interest fund							$ 6,430.95			$ 6,430.95
Cash to balance as follows:										
Support funds	$11,007.96			$ 4,577.01	$ 6,430.95				$6,430.95	
State appropriations	3.85		334.40		338.25				338.25	
Miscellaneous accounts	602.26		295.63		897.89				897.89	
Total	$24,014.07	$24,014.07	$253,530.57	$253,530.57	$273,027.63	$273,027.63	$ 99,321.89	$ 99,261.89	$8,597.09	$ 8,597.09

STATE APPROPRIATIONS.

Account.	Balance July 1, 1901.	Drawn from state treasurer.	Expended during year.	Balance June 30, 1902.
Improvements and current expenses, year ending June 30, 1901	$ 3.60	$ 73.41	$ 77.01	
Improvements and current expenses, year ending June 30, 1902		18,294.85	17,956.60	$ 338.25
State providential fund		2,998.51	2,998.51	
General engineering hall	.25	42,757.11	42,757.36	
Special building tax		48,038.63	48,038.63	
Pure-bred stock		909.20	909.20	
Experiment station barn		17.01	17.00	
Total	$ 3.85	$118,088.77	$112,754.37	$ 338.25

TREASURER'S REPORT—STEWARD'S DIVISION.

	Balances July 1, 1901.		Fiscal Year.		Totals.		Balance June 30, 1902.	
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Boarding departm't		$ 2.04	$12,118.43	$12,125.97	$12,118.43	$12,128.01		$ 9.58
Damages		403.34	25.00	114.00	25.00	517.34		492.34
Hospital		450.54	3,043.12	2,961.60	3,043.12	3,412.14		369.02
Fires, lights and incidentals			19,455.33	19,455.33	19,455.33	19,455.33		
Piano rent		1.00	174.50	174.50	174.50	174.50		
A. M. Newens		6.00				6.00		6.00
	$ 862.92		14.02		876.94		$ 876.94	
Total	$ 862.92	$ 862.92	$34,830.40	$34,830.40	$35,693.32	$35,693.32	$ 876.94	$ 876.94

TREASURER'S REPORT—EXPERIMENT STATION.

Expenditures on account of the government appropriation for the fiscal year ending June 30, 1902.

	Government Appropriation.	
	Debit.	Credit.
Government appropriation		$ 15 000.00
Salaries	$ 4,075.00	
Stenographer	353 00	
Artist	375.00	
Bulletins	940.41	
General expenses	448.23	
Agricultural section	4,000 28	
Botanical section	579.84	
Chemical section	1,000.00	
Dairy section	445.87	
Entomological section	657.37	
Horticultural section	1,625.00	
Veterinary section	500.00	
Total	$ 15,000.00	$ 15,000.00

EXPERIMENT STATION—CREDITS.

(Sales by Departments.)

	Balances July 1, 1901.		Fiscal Year.		Totals.		Balances June 30, 1902.	
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Experiment station		$ 53.59	$3,545.68	$4,284.58	$3,545.68	$4,338.12		$792.44
Cash balance	$ 53.59		738.85		792.44		792.44	
Total	$ 53.59	$ 53.59	$4,284.58	$4,284.58	$4,338.12	$4,338.12	$792.44	$792.44

TREASURER'S REPORT.

The following is a complete statement of the transactions of the accounts for the fiscal year ending June 30, 1903.

Account.	Balance July 1, 1902.		Fiscal Year.		Totals.		Support Funds.		Balance June 30, 1903.	
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Support funds, balance June 30, 1902		$6,430 95				$ 6,430 95		$ 6,430 95		
Interest on lands belonging to Cong'l grant				$ 430 95		430 95		430 95		
Interest on accumulated interest				119 33		119 33		119 33		
Interest on investment of endowment fund				36,093 25		36,093 25		36,093 25		
Interest on lands obtained by foreclosure				85 00		85 00		85 00		
State additional support fund				60,000 00		60,000 00		60,000 00		
Contingent principal fund		900 00	$ 900 00		$ 900 00	900 00				
Mortgages receivable	$ 900 00			900 00	900 00	900 00				
Agricultural fellowship			300 00	530 00	300 00	530 00				$ 230 00
Donation fund		156 83		35 00		191 83				191 83
Diploma fund		106 42	314 45	420 00	314 45	616 42				301 97
Room rent		426 64	2,342 34	1,916 48	2,342 34	2,343 12				78
Railroad damages		88 00				88 00				88 00
Tuition			12 00	912 00	12 00	912 00				900 00
Morrill support fund			25,000 00	25,000 00	25,000 00	25,000 00	$25,000 00	25,000 00		
Salaries			26,397 48	200 00	26,397 48	200 00	26,197 48			
Farm department			17,752 64	13,413 60	17,752 64	13,413 60	4,339 04			
Creamery department			7,844 50	6,357 50	7,844 50	6,357 50	1,487 00			
Animal husbandry department			2,039 03	853 00	2,039 03	853 00	1,186 03			
Dairy department			1,733 19	1,151 25	1,733 19	1,151 25	581 94			
Horticulture			3,669 28	943 69	3,669 28	943 69	2,725 59			
Chemistry			5,379 80	2,808 96	5,379 80	2,808 96	2,570 84			
Civil engineering			3,292 08	92 05	3,292 03	92 05	3,199 98			
Zoology			2,888 02	839 92	2,888 02	839 92	2,048 10			
Mechanical engineering			11,830 12	5,371 49	11,830 12	5,371 49	6,458 63			
Agronomy			719 16	333 15	719 16	333 15	386 01			
Physics and electrical engineering			3,812 52	912 55	3,812 52	912 55	2,899 97			
Veterinary			2,603 47	1,350 43	2,603 47	1,350 43	1,253 04			
Botany			2,141 65	719 50	2,141 65	719 50	1,422 15			
Music department			1,010 39		1,010 39		1,010 39			
Public rooms			8,345 49		8,345 49		8,345 49			
Contingent expense			9,004 69		9,004 69		9,004 69			
French and German			772 55		772 55		772 55			
Library			4,897 46	5 16	4,897 46	5 16	4,892 30			
English department			4,352 37	8 70	4,352 37	8 70	4,343 67			
Domestic economy			2,641 85	491 92	2,641 85	491 92	2,149 93			
Political economy			1,024 00		1,024 00		1,024 00			
Mathematics			3,957 01		3,957 01		3,957 01			
Elocution and oratory			461 73		461 73		461 73			
History and physiology			1,281 69	1 69	1,281 69	1 69	1,280 00			
Military			101 82	2 00	101 82	2 00	99 82			
Geology			524 85	35 80	524 85	35 80	489 05			
Mining engineering			1,897 17	59 50	1,897 17	59 50	1,777 67			
Agricultural chemistry			1,622 13	634 71	1,622 13	634 71	987 42			
Public grounds			3,136 25	1,638 91	3,136 25	1,638 91	1,497 34			
Sabbath services			452 75		452 75		452 75			
Repairs and improvements			1,499 25		1,499 25		1,499 25			
*State appropriations		338 25	140,512 39	140,924 06	140,512 39	141,262 31				749 92
Total	$ 900 00	$ 8,537 09	$309,847 52	$305,591 58	$309,247 52	$314,128 62	$125,740 86	$128,159 46		$ 2,462 50
Balance support funds							$ 2,418 60			2,418 60
Cash to balance as follows:										
Support funds	$ 6,430 95			$ 4,012 85	$ 2,418 60				$2,418 60	
State appropriations	338 25		411 67		749 92				749 92	
Miscellaneous accounts	807 89		844 69		1,712 58				1,712 58	
Total	$ 8,537 09	$ 8,537 09	$309,603 88	$309,603 88	$314,128 62	$314,128 62	$128,159 46	$128,159 46	$4,881 10	$ 4,881 10

*STATE APPROPRIATIONS.

	Balance July 1, 1902.	Drawn from state treasurer.	Expended during year.	Balance June 30, 1903.
Improvements and current expenses, year ending June 30, 1902	$ 338 25	$ 205 15	$ 543 40	
Improvements and current expenses, year ending June 30, 1903		18,500 00	18,500 00	
State providential fund		3,000 00	3,000 00	
General engineering hall		7,258 51	7,258 51	
Experiment barn		4,982 94	4,982 94	
Pure bred stock		30 00	30 00	
Pure bred stock		3,317 86	3,317 86	
Special building tax		103,629 60	102,879 68	749 92
Total	$ 338 25	$140,924 06	$ 140,512 39	$ 749 92

TREASURER'S REPORT—STEWARD'S DIVISION.

Account.	Balance July 1, 1902.		Fiscal Year.		Totals.		Balance June 30, 1903.	
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Boarding department	$ 9.58	$ 759.09	$ 749.51		$ 759.09	$ 759.09		$ 1.81
Damages	492.34	553.58	63.00		553.58	555.84		186.21
Hospital	389.02	2,933.44	2,750.63		2,933.44	3,119.05		
Fires, lights and incidentals		25,463.91	23,463.91		23,463.91	23,463.91		
Piano rent		100.50	100.50		100.50	100.50		
A. M. Newens		6.00				6.00		6.00
Balance	876.64						$194.02	
Total	$876.64	$27,810.47	$27,127.55		$27,810.47	$28,004.49	$194.02	$194.02

TREASURER'S REPORT—EXPERIMENT STATION.

Account.	Balance July 1, 1902.		Fiscal Year.		Total.		Support Funds.		Balance June 30, 1903.	
	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.	Debit.	Credit.
Government appropriation				$ 15,000.00		$ 15,000.00		$ 15,000.00		
State support funds				10,000.00		10,000.00		10,000.00		
Salaries			$ 4,858.29	200.00	$ 4,858.29	200.00	$ 4,658.29			
Director's fund and artist		$792.44	1,390.67	2.00	1,390.67	794.44	596.23			
General expenses			608.37		608.37		608.37			
Bulletins			2,442.42	9.00	2,442.42	9.00	2,433.42			
Animal husbandry section			7,365.80	3,633.17	7,365.80	3,633.17	3,732.63			
Agronomy section			3,263.56	877.45	3,263.56	877.45	2,386.11			
Agricultural and soil physics section			748.28		748.28		748.28			
Botanical section			1,057.52		1,057.52		1,057.52			
Chemical section			1,613.66	16.10	1,613.66	16.10	1,597.56			
Dairy section			699.19	89.98	699.19	89.98	609.21			
Entomological section			425.69		425.69		425.69			
Horticultural section			2,735.51	135.51	2,735.51	135.51	2,600.00			
Veterinary section			725.27	72.50	725.27	72.50	652.77			
Building section			750.00		750.00		750.00			
Total		$792.44	$ 28,684.23	$ 30,035.71	$ 28,684.23	$ 30,828.15	$ 22,856.08	$ 25,000.00		
Balance	$792.44		1,351.48		2,143.92		2,143.92			$ 2,143.92
Cash on hand									$2,143.92	
Total	$792.44	$792.44	$ 30,035.71	$ 30,035.71	$ 30,828.15	$ 30,828.15	$ 25,000.00	$ 25,000.00	$2,143.92	$ 2,143.92

SECRETARY'S REPORT.

IOWA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

REPORT OF THE SECRETARY.

INCLUDING A SUMMARY OF COLLEGE FINANCES FOR THE BIENNIAL PERIOD.

MEMBERS OF THE BOARD OF TRUSTEES.

Ex officio—HON. ALBERT B. CUMMINS, *Governor of Iowa.*
Ex officio—HON. R. C. BARRETT, *Superintendent of Public Instruction.*

	TERM EXPIRES
First District—Hon. S. H. Watkins, Libertyville	1904
Second District—Hon. C. S. Barclay, West Liberty	1904
Third District—Hon. E. A. Alexander, Clarion	1908
Fourth District—Hon. C. L. Gabrilsen, New Hampton	1904
Fifth District—Hon. W. R. Moninger, Marshalltown	1906
Sixth District—Hon. W. O. McElroy, Newton	1908
Seventh District—Hon. W. K. Boardman, Nevada	1906
Eighth District—Hon. W. B. Penick, Chariton	1904
Ninth District—Hon. James H. Wilson, Adair	1908
Tenth District—Hon. J. B. Hungerford, Carroll	1906
Eleventh District—Hon. W. J. Dixon, Sac City	1906

OFFICERS OF THE BOARD.

Hon. J. B. Hungerford, Carroll	Chairman
E. W. Stanton, Ames	Secretary
Herman Knapp, Ames	Treasurer
W. A. Heisell, Odebolt	Financial Agent
John Franklin Cavell, Ames	Custodian

STANDING COMMITTEES.

GROUP I.

Finance Committee.—Governor Cummins, Trustees McElroy, Barclay, Penick, Alexander and Hungerford.

Building Committee.—Trustees Dixon, Hungerford, Boardman; additional members, Watkins and Gabrilsen.

GROUP II.

Committee on Agriculture, Horticulture, Experiment Station and Veterinary Science.—Trustees Barclay, Boardman, Moninger, Wilson and Governor Cummins.

Committee on College Hospital and Sanitary Arrangements.—Trustees Watkins, Moninger and Penick.

GROUP III

Committee on Faculty and Courses of Study.—Trustees McElroy, Barrett, Hungerford, Gabrilsen, Alexander and Dixon.

Committee on College Lands and Investments.—Trustees Penick, Moninger and Governor Cummins.

Committee on Rules.—Trustees Wilson, Boardman and Alexander.

GROUP IV.

Committee on Scientific Departments.—Trustees Alexander, Gabrilsen, Barrett McElroy and Watkins.

Committee on Literary Departments and Library.—Trustees Wilson, Boardman, Barrett, Alexander and Penick.

Committee on Public Grounds and Assignment of Rooms.—Trustees Hungerford, Alexander and Barclay.

Committee on Bonds.—Trustees Moninger and Wilson.

It is designed in this report to give, in condensed form, a history of the finances of the College during the past two years, and in connection therewith to present a general view of the present financial condition of the institution. This will necessarily include a discussion of its endowment, buildings and equipment, income and cost of maintenance.

THE COLLEGE ENDOWMENT.

The original source of the College endowment was the grant of land by congress in 1862. The college realized from this grant 203,993.66 acres. Being unable at the time to sell the land except at a ruinously low price, the legislature of the state originated and put into effect a plan for leasing it on ten-year leases, which granted to the lessee the right of purchase at the valuation fixed upon at the beginning of the lease. The lessee paid 8 per cent interest in advance upon the appraised value, which in those early days was necessarily low. As time went by many of these leases were forfeited for non-payment of interest. In all such cases the land was reappraised and again leased. As the leases expired payment of principal was made and patents issued by the governor, or else the leases were renewed for another term of years. Through the reappraisement of forfeited leases the principal of the congressional endowment was increased by about $125,000.00.

The rental collected on these leased lands, in those early days, more than met the expenses of the College. The surplus was invested in land, state and municipal bonds and farm mortgages. The lands thus purchased were handled in the same way as those belonging to the congressional grant, with the result of a considerable increase in the fund as forfeited leases were reappraised. All of this land has now been patented, and the other investments realized upon. As payments have been made the proceeds have been remitted to the state treasurer and, under the law, credited to the endowment fund. The congressional endowment has been increased in this way by some $93,954.51, making the total present fund $683,708.52.

During the years when the fund was mostly in the shape of land an agent was employed who had charge of leasing the land and collecting the rental. He also loaned the surplus interest fund not invested in land. As the lands of the congressional grant were gradually patented the proceeds were, for a time, invested by the state treasurer in state and municipal bonds. In 1884 Congress by a special act, authorized Iowa to invest this fund in farm mortgages and the state legislature, to carry out

his purpose, established the College Financial Agency. It has been the idea of the trustees in these later years to consolidate the management of the entire fund under the Financial Agent. This plan is now nearly accomplished. The unpatented land of the congressional grant, amounted, at the beginning of the last biennial period, to only 2336.02 acres appraised at $10,054.08. During the two years 1320 acres appraised at $5,320 have been patented, leaving 1016.02 acres appraised at $4,734.08 as the inconsiderable fraction of the original grant still held in the name of the College and managed under the old system. At the beginning of the period there was under the charge of the land agent loans of the surplus interest fund amounting to $12,400. These have all been collected, as they came due, and the proceeds remitted to the state treasurer. A tract of forty acres of land in Polk county, acquired under foreclosure of mortgage and costing the College $2,418.55, is under temporary lease, made directly by the Board of Trustees. This tract and the 1016.02 acres of unpatented land belonging to the congressional grant already mentioned, constitute the only portion of the entire fund not included in the financial agency. Dividing the fund in relation to its management we have then the following:

Managed by Agent Knapp	$ 4,734.08
Managed by the Board of Trustees direct	2,418.55
Managed by the Financial Agent	676,555.89
Total	$683,708.52

The land in the Knapp agency is leased upon the 8 per cent basis; the Polk county tract under a short time lease at $85 per annum; the portion of the fund managed by the financial agent, W. A. Helsell, is invested in farm mortgages bearing from 5 to 7 per cent annual interest.

The following shows in brief the operations of the financial agency for the last biennial period:

THE FINANCIAL AGENCY.

At the beginning of the period the uninvested balance to the credit of the agency was	$ 7,235.89	
Loans of the agency paid during the two years amounted to	170,750.00	
Land patented and proceeds credited to agency	5,320.00	
Loans of Knapp agency collected and proceeds added to agency funds	$ 12,400.00	
Making total to be loaned by the agency		$ 195,705.89
The agent has loaned on 6 per cent mortgages	$12,000.00	
The agent has loaned on 5 per cent mortgages	183,600.00	
	$ 195,600.00	
Cash in hands of state treasurer	$ 5 89	
Cash in hands of Agent Helsell	100.00	
	105.89	
		$ 195,705.89

The following shows the present condition of the endowment fund as a whole:

Land under lease at 8 per cent, 1,016.02 acres	$ 4,734.08
Farm mortgages bearing 7 per cent interest	31,300.00
Farm mortgages bearing 6 per cent interest	123,850.00
Farm mortgages bearing 5 per cent interest	521,300.00
Polk county tract land at $85.00	2,418.55
Total yielding income	$683,602.63
Uninves ed cash balance	105,89
Total	$683,708.52

A comparison of this exhibit with that made two years ago will show a large decrease in the 6 and 7 per cent loans, and a corresponding increase in the 5 per cent mortgages. This refunding process has not gone on as rapidly as was anticipated at the time of the last report. It will no doubt, however, continue until the income of the college from this source is reduced to about $34,000.

The method of handling the endowment fund through the financial agency has been found to be eminently satisfactory. Under the law establishing the agency the amount loaned upon a farm cannot exceed 50 per cent of its value exclusive of buildings; the forms of notes, mortgages, coupons, etc., used are prepared by the attorney general under the direction of the executive council; the loans are made by the financial agent who gives a bond of $50,000, conditioned upon the exercise of care and diligence upon the part of himself and his sub-agents in

making such loans and in all ways performing faithfully the duties of the agency; the funds are drawn by the agent from the state treasury as needed to complete loans; the state treasurer is made the custodian of all papers connected with such loans, and collects both principal and interest; the secretary of the board of trustees approves the agent's drafts upon the treasurer, receipts to the agent for the loan papers when the loan is completed, and after entering a full abstract of such papers in his loan register, forwards them to the state treasurer. He keeps an account with each loan, the treasurer making monthly reports to his office of interest and principal collected. In connection with the chairman of the board of trustees he executes all releases of mortgages. He is thus enabled, from the accounts kept in his office, to give the board of trustees, at any time, full information regarding the condition of the endowment fund, while his books constitute a check upon the accuracy of the accounts of the different officers dealing with the fund. A comparison of books shows that these officers have faithfully accounted for all funds entrusted to their care during the biennial period.

During the nineteen years since the agency was established loans amounting to $1,602,075.80 have been made, of which $676,450 are now in force. Only two loans have been foreclosed, each one resulting in financial benefit to the college.

GROUNDS, BUILDING AND EQUIPMENT.

The land upon which the college is situated was purchased by the state in June, 1859. The original tract contained 647½ acres and cost $5,380. Small additions have been made at various times since then, until now the college domain—including the farm proper, the experimental fields, the horticulture grounds and the college campus—aggregates 841.38 acres.

The national law establishing the land grant colleges provided that each state should furnish all necessary buildings and keep them in repair. In carrying out this agreement the state has erected the buildings upon the college campus and equipped them for department use. Much of the department apparatus, however, has been purchased from the national support fund. The following summary gives a fairly correct idea of the extent and value of the college property at Ames:

Land:		
Farm proper, 581.38 acres at $100	$ 58,138.00	
Experiment station grounds, 60 acres at $100	6,000.00	
Plots for horticultural experiments, 13 acres at $85	1,105.00	
Orchard and arboretum, 25 acres at $100	2,500.00	
College campus, 125 acres at $100	12,500.00	
College park, 37 acres at $60	2,220.00	
Total for 841.38 acres		$ 82 463.00
Buildings:		
Margaret hall	$ 60,000 00	
Morrill hall	40,000.00	
Chemical and physical building	30,000.00	
Music hall	5,000.00	
Chime and clock tower	7,000.00	
College hospital	5,500.00	
Office building	7,000.00	
Book department building	1,800.00	
Boarding cottages	10,000.00	
Engineering hall (not including furnishings)	193,162.50	
Carpenter shop	5,000.00	
Forge shop	5,000.00	
Power station	7,000.00	
Old pumping station plant	250.00	
Fire department building	400.00	
Foundry store house	100.00	

Greenhouses		$ 19,000.00
Veterinary hospital		8,000.00
Agricultural hall		110,000 00
Creamery—		
Creamery proper	$ 8,000.00	
Dormitory portion	4,000.00—	12,000.00
Ice house		1,000.00
Cattle barn		15,000.00
Feeding sheds		2,500.00
Experiment station barn		18,000.00
Horse barn and stock judging pavilion		15,000.00
Corn and stock judging pavilion		13,000.00
Hog house		1,500.00
Movable hog houses (fifteen)		500.00
Sheep barn		1,500.00
North hall		2,500.00
Residences Occupied by:		
President Storms		13,000.00
Professor Curtiss		5,000.00
Professor Weems		2,500.00
Professor McKay		1,500.00
Professor Bissell		2,500.00
Professor Summers		2,500.00
Professor Noble		3,000.00
Professor Stanton		4,000.00
Professor Marston		3,000.00
Professor Holden		1,500.00
Horticultural Foreman		1,000.00
Experiment station foreman		1,000.00
Farm laborer		800.00
Boarding club		800.00
Total buildings		$ 638,812.50
General Equipment:		
Waterworks, including water tower, deep well, pumping machinery and piping system	$ 36,000.00	
Power plant, including three boilers, four high-speed engines, piping, boiler and engine room, appliances, etc	15,000.00	
Electric light, including four dynamos, switch board appliances, pole line and transformers	7,000.00	
Sewage system	5,500.00	
Sewage disposal system	3,000.00	
Office building furniture	2,000.00	
Furniture of public rooms	4,925.00	
College hospital furniture	1,500.00	
Boarding department	454.21	
Fire department	1,525.00	
Total general equipment		$ 76,904.21

Department Equipment:		
Experiment Station—		
Agronomy section	$ 1,079.40	
Animal husbandry section	7,360.05	
Horticultural section	356.50	
Chemical section	3,065.18	
Botanical section	1,000.00	
Dairy section	100.00	
Entomological section	1,226.10	
Veterinary section	926.75	
Total department equipment		$ 15,113.98
Farm Department	$ 27,932.70	
Agronomy	239.62	
Animal husbandry	300.00	
Dairy	970.00	
Creamery	3,721.64	
Horticultural department	1,510.75	
Veterinary department	2,757.30	
Agricultural chemistry	1,330.06	
General chemistry	9,675.00	
Zoology	15,332.43	
Botany	15,414.85	
Geology	3,253.00	
Physics and electrical engineering, including equipment and furniture	25,130.70	
Civil engineering, including equipment and furniture	14,100.00	
Mechanical engineering, including equipment and furniture	41,052.72	
Mining engineering, including equipment and furniture	7,179.45	
Domestic economy	1,601.89	
Military department	215.00	
English literature and rhetoric	189.50	
Public grounds	135.00	
Library	50,000.00	
Music department	2,038.00	
Pipe organ and piano	1,750.00	
Chimes and clock	9,000.00	
Total department equipment		$249,043.59
Total value of college property exclusive of endowment fund		$1,048,123.30

BUILDINGS AND IMPROVEMENTS ADDED DURING THE LAST BIENNIAL PERIOD.

The state aid granted the college for buildings and improvements can be classed to advantage under the following heads:

1. Direct appropriations.
2. Special building tax.
3. Annual appropriations.

Direct appropriations have been made, in some instances, for the beginning of an improvement with the understanding that the proceeds of the building tax would be used to complete it. The history of such an improvement must necessarily deal with both funds.

GENERAL ENGINEERING HALL.

The Twenty-eighth General Assembly appropriated $85,000 toward the erection of a general engineering hall. The building tax fund was used, under the authority of the legislature, to complete and equip it. A full statement of the action of the board in adopting plans, letting contracts, etc., in connection with this building, can be found in the last biennial report, pages 39 to 43. The amount expended in its construction up to the date of that report was $34,984.13, leaving an unexpended balance of the direct appropriation of $50,015.87. The amount added to this balance from the special building tax was $129,681.75.

The following exhibit shows the receipts and disbursements on account of the joint fund during the biennial period:

RECEIPTS.

Balance of state appropriation of $85,000	$ 50,015.87	
Building tax appropriated to this building	129,681.75	
Total		$ 179,697.62

DISBURSEMENTS.

Paid on H. W. Schlueter's contract	$138,066.40	
Inspection of work at building	602.50	
Inspection of steel at mill and shop	193.76	
Extras on Dunham interior heating system	310.56	
Extension of heating system to janitor rooms	103.28	
Additional plastering	126.26	
Connecting hall with power house by tunnel, and piping same	1,704.19	
Feed pump extra	137.00	
Electric lighting, including conduits, wire, fixtures and installation	3,199.40	
Special electric wiring and fixtures for electrical engineering department	1,162.99	
A. N. Harding, painting building and decorating walls	2,540.04	
Extras on plumbing, including lavatory fixtures	181.58	
Equipment and furniture, including laboratory, museum and office furniture and fixtures, and cases, desks, tables, chairs, lockers, window shades and blackboards for recitation rooms	27,668.20	
Drawing tables for department drawing rooms	2,344.08	
Miscellaneous items for carpenter work and material used in completing building	236.03	
Architect's fee	964.05	
Superintendent's stenographer	63.58	
Advertising, express, telegrams, stationery and other minor items	93.72	
Total		$ 179,697.62

Adding to the above the amount expended on account of the building during the previous biennial period we have as the cost of the Engineering Hall to date, $214,681.75. This expenditure has been charged, as already stated, to the following accounts:

State appropriation for commencing the building	$ 85 000.00
Special building tax fund	129,681.75
Total	$ 214,681.75

The elevator for the building is under contract, but has not been installed. It is estimated that this and a few minor items necessary to the completion of the building will bring its total cost to about $218,500. It should be noted that this includes the heating, lighting and plumbing systems, and all the fixtures, fittings and furnishings necessary to the equipment of the build-

ing for its contemplated use. The hall was first occupied by the engineering departments in January, 1903. It was formally dedicated in the June following. The lamented Dr. Thurston, of Cornell University, who delivered the dedicatory address, said of the building, "It is the finest for its purpose that I have ever seen."

EXPERIMENT STATION BARN.

The Twenty-ninth General Assembly appropriated the sum of $5,000 for commencing this building. The trustees at their meeting in May, 1902, set aside for its completion the additional sum of $10,000 from the special building tax. The building committee was authorized to secure plans, advertise for bids, and let the contract to the lowest bidder. The committee employed Liebbe, Nourse & Rasmussen of Des Moines as architects to prepare plans and specifications, agreeing to pay them 2 per cent of the price at which the contract was let. The first two sets of bids opened by the committee being in excess of the amount set aside by the board for the erection of the building, the plans were modified and new bids asked for to be opened by the board at a meeting called for that purpose. The following were the bids submitted:

Waltmire & Connell, Ames, Iowa	$21,847.00
John R. Grier, Conrad, Iowa	17,837.00
Capital City Brick & Tile Co., Des Moines, Iowa	17,804.91
W. J. Zitterell, Webster City, Iowa	17,584.00
H. W. Schlueter, Chicago, Illinois	17,280.00

The bid of Mr. Schlueter was accepted and contract entered into in accordance therewith. Provision was made for the wiring of the barn by the mechanical engineering department of the college. The cost of construction in excess of the amount set aside by the board was ordered charged to the building tax fund. The following exhibit shows the total cost of the building and the funds used:

RECEIPTS.

Special appropriation for commencing the building	$ 5,000.00	
Building tax fund devoted to its completion	12,858.59	
Total		$17,858.59

DISBURSEMENTS.

H. W. Schlueter's contract	$ 17,280.00	
Extras on contract	85.35	
Architects, Liebbe, Nourse & Rasmussen, 2 per cent	345.60	
Electric lighting	129.96	
Advertising for bids	13.51	
Express and telephone	4.17	
Total		$ 17,858.59

THE CENTRAL BUILDING.

The College asked of the last general assembly an appropriation of $290,000 for a central building to replace the "Old Main" destroyed by fire in December, 1900. The 1-10 mill building tax, voted by the previous legislature, had been granted the institution that it might erect much needed new buildings. It had proven insufficient for this purpose let alone furnishing the means to replace old buildings destroyed by fire. Notwithstanding the admitted urgency of the College needs, the legislature was unable to appropriate the sum asked for from the general revenue. It did, however, increase the building tax levy from one-tenth to one-fifth of a mill. The College authorities, realizing that such increase would not provide the new buildings needed and at the same time take care of this large emergency item, urged most strenuously that at least $150,000 be granted the College as direct aid toward the erection of the central building. The legislature could not see its way clear at that time to appropriate more than $35,000 for this purpose. This amount was therefore voted "for the commencement of a central building."

The tax fund for 1902 having been appropriated to other uses and no other funds being available the Board decided not to begin active operations upon this building until the spring of 1903. Proudfoot and Bird of Des Moines were employed as architects to prepare plans and specifications and supervise the work of construction, receiving as their total compensation a sum equivalent to 3 per cent of the cost of the building. Plans were prepared by the architects under the direction of the building committee and bids secured which were opened at the meeting of the Board in March, 1903. The lowest bid being far in excess of the amount available, all bids were rejected and the architect

and building committee were directed to modify the plans and present them to the Board for approval. Upon the basis of these modified plans new bids were secured. These bids which were opened by the Board at its meeting May 6, 1903, were as follows:

Geo. J. Grant, St. Paul, Minn.	$364,892.00
W. J. McAlpine, Dixon, Illinois	355,100.00
James Rawson & Son, Iowa City, Iowa	346,418.00
Capital City Brick & Tile Co., Des Moines, Iowa	365,000.00
H. W. Schlueter, Chicago, Illinois	325,267.00

In addition to taking bids upon the building complete, the work was divided into eleven sections and bids received on each section. The aggregate, however, of the lowest bids on the different sections exceeded the lowest bid on the building as a whole. Mr. Schlueter, the lowest bidder, offered to make deductions from his bid as follows:

Complete bid on first plans		$ 325,267.00
Deductions:		
Substituting Bedford stone for granite	$ 15,000.00	
Substituting National system of fire-proofing for Columbian	6,000.00	
Substituting common for hard plastering	4,267.00	
Total		$ 25,267.00
Bid on basis of reductions		$300,000.00

The bid being considered by the trustees as still beyond the means available, the architect and building committee were directed to further modify the plans looking to a reduction in cost. Mr. Schlueter, after consultation with the committee, presented to the Board at its meeting May 16th, a proposition to erect the building for $262,000 upon the basis of the following changes in the original plans and specifications in addition to those made in his bid of $300,000.

Bid of May 6th, including deductions		$ 300,000.00
Further reductions:		
Omission of dome	$ 21,000.00	
Change in stone	5,000.00	
Imitation marble changed to Keen concrete	4,000.00	
Ornamental plastering omitted	3,000.00	
Change in roofing	2,000.00	
Ornamental iron	1,500.00	
Cement floors changed to planed floors	500.00	
Tile floors in basement changed to cement	1,000.00	
Total deductions		$ 38,000.00
Bid after making deductions		$ 262,000.00

After mature deliberation the board decided to accept the proposition of Mr. Schlueter, and directed that a contract be drawn with him upon the basis of his modified bid. Mr. Schlueter furnished an approved bond of $75,000.00, signed by the Union Surety and Guaranty Company. Professor Marston was appointed local superintendent. The actual expenditures on account of this building, during the biennial period, are small and were charged to the tax fund. They may be summarized as follows:

Architect's fee, part payment	$ 1,500.00	
Advertising for bids	70.00	
Moving old boilers	129.69	
Expenses of chairman of building committee visiting other institutions with architect to inspect college buildings, looking to preparing plans for new building	90.73	
Surveying site, messages and other minor items	13.13	
Total		$ 1,803.55

The following items of expense ordered by the board of trustees will need to be paid from the fund in the near future:

Architect's fee	$ 4,800.00	
Superintendent's office expenses	250.00	
Inspection and testing	450.00	
Moving heating plant	2,500.00	
Drain for basement	1,000.00	
Total		$ 9,000.00

The contract with Mr. Schlueter looks to the completion of the foundation during the present year, 1903, using the direct appropriation of $35,000.00 for this purpose. It provides for the completion of the building by September 1, 1905. The contract price does not include the interior heating, lighting and plumbing systems, nor the fixtures and furnishings for the offices, laboratories and recitation rooms. The architect estimates the cost of these at $73,000.00. To insure the permanency of the structure it is exceedingly desirable that the base shall be of granite instead of Bedford stone. As the center piece of the College buildings of the future, it should bear the distinctive markings which the dome and portico contemplated in the original plans of the architects will give it. To restore these items in the contract will cost $37,000.00, making a total appropriation of $110,-

000.00 necessary to fully complete and furnish the building. The payments promised under the Schlueter contract will absorb the entire proceeds of the building tax for 1904 and 1905, after the completion of the agricultural buildings now under way is provided for. The building itself will be completed in time for the opening of the College year of 1905-6, but it cannot be used and thus the large expenditure it represents realized upon, except it be heated, lighted and furnished. The urgency of the need for the early occupancy of this building by the departments now temporarily located in Emergency Hall is strongly set forth by President Storms in his portion of this report. The trustees most emphatically endorse his presentation and earnestly urge that the appropriation necessary to complete the building by the fall of 1905 be granted.

NEW AGRICULTURAL BUILDINGS.

The board of trustees at its meeting in November, 1902, made provision for the erection of a fireproof addition to agricultural hall, a two-story stock-judging pavilion, additional feeding sheds for the farm, and greenhouses for the departments of horticulture, agronomy and soils. Arrangements were made, at a later meeting, to add to this list an insectary for the entomological section of the experiment station. To cover the cost of these buildings the following sums were set aside by the board:

From the special building tax		$ 55,799.00
From the annual fund for repairs and improvements		300.00
From the $750 of the national experiment station fund for 1902-3 which can be legally used for building purposes	$ 750.00	
From the station fund for 1903-4	450.00	1,200.00
Total		$ 57,299.00

It was understood that the sum thus set aside should not include the heating, lighting, plumbing and furnishings for these buildings, but that the amount necessary for these purposes would be appropriated from the special building tax.

Proudfoot and Bird, of Des Moines, were employed as architects under an agreement to furnish plans and specifications and supervise the work for 3 per cent of the cost of the improvements. Plans were prepared under the direction of the building committee, and bids secured for submission to the board. These bids, which were opened at a meeting of the trustees held March 26th, 1903, were as follows:

Addition to Agricultural Hall:	
James Rawson & Son, Iowa City, Iowa	$47,747.00
John R. Geir, Conrad, Iowa	40,920.00
Capital City Brick & Tile Co., Des Moines, Iowa.	40,450.00
Henry W. Schlueter, Chicago, Illinois	39 601.00
C. E. Atkinson, Webster City, Iowa	37,974.00
Judging Pavilion:	
James Rawson & Son	$16,950.00
John R. Gier	12,513.00
Capital City Brick & Tile Co	12,116.40
Henry W. Schlueter	12,966.00
C. E. Atkinson	12,380.00
Greenhouses:	
James Rawson & Son	$10,172.00
John R. Gier	8,954.00
Capital City Brick & Tile Co	8,320.00
Henry W. Schlueter	9,575.00
C E. Atkinson	8,390.00
Feeding Sheds:	
Capital City Brick & Tile Co	$ 1,766 00
M. Hullibarger, Ames, Iowa	1,248 00

The lowest combined bid on the first three items of the list—that of Mr. Atkinson which aggregated $58,744—being in excess of the funds set aside for these improvements, the board directed the building committee, Architect Proudfoot and Professor Curtiss to consult with Mr. Atkinson concerning changes in the plans and specifications for these buildings, and authorized the building committee to enter into contract with Mr. Atkinson upon the basis of such changed plans and specifications, provided a satisfactory agreement could be reached at a cost within the limit of the amount set aside by the board. The committee was able to make contract with Mr. Atkinson upon this basis.

A misunderstanding having arisen regarding the correct interpretation of the plans and specifications for the feeding sheds, new bids were asked upon this improvement, with the following results:

Mr. Hullibarger, Ames, Iowa	$ 1,623.00
C. E. Atkinson, Webster City, Iowa	1,565.00

The contract for the erection of the building was awarded to Mr. Atkinson. His proposition to build the insectary complete

for $1,982 was also accepted. This gave to Mr. Atkinson the erection of all the buildings included in this list of agricultural improvements upon contracts, as follows:

Addition to agricultural hall, judging pavilion and greenhouses	$ 53,752.00	
Feeding sheds	1,565.00	
Insectary	1,982.00	
Total		$ 57,299.00

The payments on the Atkinson contract amounted, at the close of the biennial period, to $5,895. The other expenditures connected with these improvements, paid from the tax fund, were as follows:

Advertising for bids	$ 32.15	
Architect, part payment	500.00	
Expenses of Prof. Curtiss investigating agricultural buildings at Madison, Guelph, Toronto, Champaign and St. Louis	82.45	
Inspection on building	42.60	
Surveying sites, express on plans, messages and other minor items	22.22	
Total		$ 679.42

Provision has been made by the trustees for the heating, lighting and plumbing of these buildings, and in large part for the interior fixtures, equipment and furnishings. It has also been found necessary to restore certain items which were omitted from the original contract in the endeavor to lessen the cost. In addition to the general supervision of the construction by the architect, arrangements have been made for local inspection as the work progresses. The following statement shows approximately the amounts set aside by the Board for these various purposes. In all cases, where practicable, contracts have been entered into, and in the others, careful estimates of cost have been made.

Heating and plumbing for agricultural hall and greenhouses	$ 15,000.00
Hot air furnaces for stock pavilion	535 00
Electric light wiring and fixtures	1,400.00
Elevator	785.00
Fixtures and furnishings for laboratories, recitation rooms and offices	9,554.95
Farm mechanics equipment	7,550.50
Soil and grain laboratory equipment	1,600.00
Additional work on buildings	3,107.80
Architects' fee, balance	2,200.00
Inspection and other contingent items	400 00
Total	$ 42,133.25

Adding to this total the amount of the Atkinson contracts and the expense items paid in the last biennial period, we have as the probable cost of these improvements, $100,111.67, of which $98,611.67 will be chargeable to the special building tax.

The fixtures and furnishings for the judging pavilion and greenhouses, which will cost about $4,500, are not included in the foregoing estimates. It is hoped that these can be purchased from the annual repair and improvement fund if it shall be increased by the legislature as the needs of the college demand.

These agricultural buildings will be ready for occupancy by the beginning of the second semester in January, 1904. They are admirably fitted for the purposes for which they are designed, and will add greatly to the facilities for instruction in the agricultural courses.

SPECIAL BUILDING TAX.

The Twenty-eighth General Assembly voted the college a building tax of one-tenth of a mill on the taxable property of the state. This was increased by the Twenty-ninth General Assembly to one-fifth of a mill. The following is the statute granting the increased levy:

Levy of Special Tax For State College of Agriculture and Mechanic Arts.

Be it enacted by the General Assembly of the State of Iowa:

Section 1. *Repealed.*—That chapter 99 of the acts of the Twenty-eighth General Assembly of the state of Iowa, is hereby repealed.

Sec. 2. *Levy of Special Tax—Purposes—How Drawn.*—For the purpose of providing for the erection, repair and improvement and equipment of such necessary buildings as shall be determined upon by the board of trustees of the Iowa state College of agriculture and mechanic arts, there shall be levied annually for five years a special tax of one-fifth of a mill on the dollar upon the assessed valuation of the taxable property of the state, and the proceeds thereof shall be carried into the treasury to the credit of the said college. Said levy shall be first made with the levy made for state purposes in the year nineteen hundred and two (1902) and the same levy shall be made

annually for the four successive years thereafter. The money realized from such levy for said college shall be held by the treasurer of the state for the purpose hereinbefore provided and drawn upon requisition of the board of trustees. The funds to be realized from the tax levies herein provided for shall not be anticipated by issuing and discounting warrants or other obligations of the state.

SEC. 3. *Repeal Not to Affect Collection or Expenditure of Taxes.*—The repeal of said chapter 99, acts of the Twenty-eighth General Assembly shall in no manner affect the collection and expenditure of the taxes heretofore levied thereunder but the same shall be collected and expended as though said act remained in full force.

SEC. 4.—*In Effect.*—This act, being deemed of immediate importance, shall take effect and be in force from and after its publication in the Iowa State Register and the Des Moines Leader, newspapers published in Des Moines, Iowa.

Approved April 7, 1902.

The College began to realize an income under the law of the Twenty-eighth General Assembly in 1901. The collections for the first half of that year amounted to $30,498.91. No portion of this amount, however, was drawn from the state treasury by the College prior to July 1, 1901, so that the expenditures on account of this fund begin with the last biennial period.

The amount available during the biennial period and the disbursements on account of the fund are shown in the following statement:

RECEIPTS.

Total amount collected prior to July 1, 1903.....		$ 174,463.52

DISBURSEMENTS.

Paid on engineering hall.....	$ 129,681.75	
Paid on experiment station barn	12,858.59	
Paid on new agricultural buildings	6,574.42	
Paid on new central building.....	1,803.55	
Total disbursed.....		$ 150,918.31
Cash in state treasury.....	$22,795.29	
Cash in College treasury.....	749.92	
Total cash.....		$ 23,545.21
Total.....		$ 174,463.52

Looking to the future of this fund no payments on the Schlueter contract for the erection of the central building will be due before May 1, 1904, and some of the contracts on the agricultural buildings are not payable until that time. The estimated receipts up to and including that date are as follows:

Balance on hand July 1, 1903.....	$ 23,545.21	
Estimated collections for last half of 1903	48,837.52	
One-half of estimated proceeds for 1904	63,000.00	
Total.....		$ 135,382.73

The following are the probable charges against the fund for the same period:

Engineering hall elevator and minor items.	$ 3,818.25	
Agricultural buildings.....	92,037.25	
Central building:		
Items already listed.....$ 8,000		
Payment on Schlueter contract ..... 32,000—	40,000.00	
Total		$ 135,855.50

Since the tax collections for the first half of the year are always in excess of those for the second half, the College will no doubt have the money to meet all obligations.

The following exhibit shows the probable proceeds of the tax levy under both the old and the new tax bills, and the lines of expenditures marked out by the trustees:

RECEIPTS.

Proceeds of tax for 1901, one-tenth mill.....	$ 54,301.04	
Proceeds of tax for 1902, one-tenth mill.....	55,000.00	
Proceeds of tax for 1903, one-fifth mill (estimated)	114,000.00	
Proceeds of tax for 1904, 1905, 1906 and 1907, one-fifth mill (estimated)	504,000.00	
Total.....		$ 727,301.04

EXPENDITURES.

Engineering hall.....$	133,500.00	
Agricultural Buildings:		
Experiment station barn..... $12,858.59		
Addition to Agricultural hall, stock judging pavilion, feeding sheds and greenhouses..... 98,611.67—	111,470.26	
Central building.....	237,000.00	
Remaining for Agricultural hall.....	245,330.78	
Total.....		$ 727,301.04

The carrying out of the last part of this schedule of expenditures is dependent upon the state coming to the aid of the College by a direct appropriation for the completion of the central building and the installation of a central heating plant. If these appropriations are granted the central building can be ready for use by the opening of College in the fall of 1905, thus relieving the congested condition in several of the important departments of the College, and at the same time releasing sufficient of the tax fund to permit the erection of a new Agricultural hall in the last two years of the tax period.

ANNUAL APPROPRIATION FOR REPAIRS AND IMPROVEMENTS.

The annual appropriation granted the College by section 2574, of the Code of 1897, is the consolidation of three annual appropriations voted by as many different general assemblies for the repair and improvement of college buildings. While the wording of the later support appropriations would permit their use for this purpose, it has been the desire and intent of the trustees to confine expenditures of this character to the limits of this original appropriation. The necessities of the last biennial period have, however, compelled them to make an exception to this general rule and to transfer $1,499.25 from the state support fund to the repair fund. The following exhibit shows the receipts and disbursements on account of this fund during the biennial period:

RECEIPTS.

Balance in state treasury July 1, 1901	$ 77.01	
Appropriation for year ending June 30, 1902	18,500.00	
Appropriation for year ending June 30, 1903	18,500.00	
Amount transferred from support fund	1,499.25	
Total		$ 38,576.26

DISBURSEMENTS.

Chemical and Physical Building:		
Installation of gas plant	$ 358.65	
General repairs	105.29	
Shades for chemical laboratory	18.85	
		$ 482.79
Morrill Hall:		
Repairing chapel seats	$ 44.70	
Pipe organ	43.76	
Shelves in library	28.82	
Repairs in zoological laboratory	$ 15.60	
Library tables	14.00	
General repairs	43.51	
		$ 190.39
Fires, Lights and Incidentals:		
Emergency water supply	$ 348.62	
Repairing deep well, including pump	379.75	
Electric light extension	97.35	
Repairing boilers	31.73	
Repairing old pumping station	53.64	
General repairs	1,631.21	
Ladder for Margaret hall	10.77	
Fire extinguishers	98.85	
Fire department expenses	55.30	
		$ 2,707.22
President's Residence:		
Cistern	$ 184.68	
Lights on first floor	103.06	
Painting	75.50	
Screens	68.79	
Basement floor	43.75	
Shades and general repairs	47.19	
		$ 522.97
Professors' Houses:		
Repairs on farm house	$ 217.86	
Repairs on house occupied by Professor Marston and installation of electric lights	133.85	
House occupied by Professor Holden, repairs and purchase of furnace	217.31	
House occupied by Professor Holden, drain and sewer	140.36	
Repairs on other professors' houses	120.46	
		$ 829.84
Margaret Hall:		
Remodeling annex for student dining-room for women	$ 360.77	
Remodeling North hall for student dining-room for women	116.21	
Repairing crematories	88.67	
Tinting walls	330.00	
General repairs, including tin roof and gutters	492.04	
		$ 1,387.69
Emergency Hall:		
Schlueters's contract for addition	1,750.00	
Extras for offices	218.79	
Blackboards	308.80	

Heating plant	$ 675.84	
Plumbing	12.75	
Partition, window shades, furniture and general repairs	188.26	
		$ 3,154.44
Horticultural Laboratory and Greenhouse:		
Contract for erection of horticultural laboratory	$5,900 00	
Extras on horticultural laboratory	211.70	
Architects for horticultural laboratory	198.60	
Wiring horticultural laboratory	16 70	
Plans, advertising, telephone, stamps, etc.	28 84	
Heating, plumbing, installation, also repairing pipes, etc	772.57	
Equipment for horticultural laboratory and museum.	529.86	
Painting greenhouse	320.00	
General repairs and improvements	494.74	
		$ 8,473.01
Agricultural Hall:		
Plastering and repairing	$ 793.95	
Fitting up animal husbandry office	213.30	
Fitting up rooms for Soil Physics	484.00	
Museum cases	182.19	
General repairs, including plastering and extension of heating plant	461.49	
Storm windows for horticultural room	98.88	
Partition and radiator in director's office	62.32	
Partition in horticultural office	10.15	
Lattice	10.62	
Agricultural chemistry laboratory repairs	18.04	
Horticultural office curtains	8.15	
		$ 2,343.09
Farm Buildings and Improvements:		
Installation of electric power in station barn, including connections	$ 916.96	
Enlarging sheep barn and general repairs	334.20	
Fencing	589.15	
Repairs on horse barn	151.45	
Repairs on cattle barn	118.59	
Repairs on farm cottage	56.42	
Repairs on station buildings, including station cottage	32.20	
Tanks for public grounds and north barn	42.95	
Paint for barns	25.35	
Bridge on north farm	185.29	
Gravel pit	100.00	
Shade trees	82.17	
Grinders and stock chute	13.50	

Repairs on hog houses	$ 26.26	
Repairs on judging pavilion	10.75	
Miscellaneous repairs	19.46	
		$ 2,704.70
Creamery:		
Boiler and setting same	$ 906.62	
General repairs on building	310.37	
Repairs on boiler room	35.00	
Repairs on pipes	34.73	
Plastering	33.72	
Separator	15.01	
		$ 1,335.45
Domestic Economy:		
Gas machines and equipment	$ 583.56	
Telephone	26.14	
General repairs	47.91	
		$ 657.61
Veterinary Department:		
Feed boxes	$ 10.50	
Bulletin board and bone rack	9.75	
General repairs	18.47	
		$ 38.72
East Cottage:		
Fitting up bath rooms	$ 171.08	
General repairs	422.13	
		$ 593.21
Engineering Building:		
Installing gas plant in new engineering hall	$ 82.02	
General repairs	59.78	
		$ 141.80
Furniture:		
Recitation room chairs for horticultural department.	$ 320.20	
Typewriter, desk and chairs for station and agricultural department	120 90	
Filing cases for mathematical department	120.30	
Filing cases for president's office	78 06	
Typewriter for secretary's office	65.50	
Botany cases	165.30	
Agronomy department—Tables, cases and shelving.	128.46	
Office desk and chairs	102.60	
Agricultural chemistry department, tables and shelving	31.03	
Cabinet keys for department of zoology	18.15	
Book case for department of English	10.35	
		$ 1,160.85

Sewage disposal maintenance	$ 440.20	
Special experiments in disposal of creamery sewage	100.25	
Repairing sewer	5.25	
Power station improvement	7,012.50	
Custodian's salary, $100 per month	625.00	
Main building—repairs, wreckage and repairs of boiler house	398.17	
Extension of water mains to Experiment station barns and repair of water system	1,037.70	
Painting water tower	310.00	
Repairs on College hospital	429.89	
Music hall—Installation of electric light and general repairs	254.76	
Physics department—Edison generator	450.00	
College carpenter	274.99	
Repair and extension of telephone system	170.00	
Acknowledging releases and building committee expenses	49.92	
Repairs in botany laboratory	38.21	
Repairs on horticultural cottage and barn	48.22	
Repairs on office building	19.25	
Repairs on club houses	23.25	
Repairing flag pole	20.00	
Survey of north farm	21.30	
Campus map	14.90	
Survey of cemetery	8.10	
Public grounds barn	17.00	
Record work	9.90	
Miscellaneous items	66.50	
		$11,845.26
Total		$38,569.26

A certain portion of this annual fund of $18,500 must necessarily be set aside to meet what may be regarded as fixed charges. Experience has determined approximately the amounts required for these purposes. The balance of the fund is used to meet the most urgent of the other needs demanding attention. The following are the amounts already appropriated by the Board from this fund for the fiscal year ending June 30, 1904:

Fixed Charges:		
Part of custodian's salary	$ 300.00	
Part of carpenter's salary	400.00	
Ordinary repairs on heating, lighting, plumbing and water supply plants	1,200.00	
Maintenance of sewage disposal system	250.00	
Sewer maintenance	50.00	
Ordinary small emergency repairs on buildings	500.00	
		$ 2,700.00
Other Repairs and Improvements:		
Remodeling chemical laboratory	$ 8,500.00	
Fitting up additional library room	500.00	
Part payment of cost of providing insectary for entomological department	300.00	
Soil department motor	50.00	
Repairing residence occupied by Prof. Summers, including purchasing of furnace and wiring house	300.00	
Repairing College farm house	300.00	
Repairing residence occupied by Prof. McKay	75.00	
Sewer and water supply for residence occupied by Prof. Noble	180.00	
Gas plant for engineer's department	450.00	
Cases for department of zoology	88.00	
Cases for department of botany	125.00	
Agricultural hall plumbing	130.00	
Fixtures and furnishings for president's house	1,500.00	
Boiler insurance	144.00	
Judging pavilion scales	100.00	
Extension of agronomy offices	50.00	
Storm windows for domestic economy rooms	75.00	
Storm windows for veterinary rooms in agricultural hall	50.00	
Hot water boiler for greenhouse	300.00	
Margaret hall fire escapes	200.00	
Power station improvements	550.00	
Repairs on horticultural buildings	110.00	
		$ 14,077.00
Total		$ 16,777.00

Other items amounting to $11,000 were referred to the building committee. The committee was empowered to order those most urgent, provided they came within the limit of the appropriation.

The amount of this repair and improvement appropriation was fixed some ten years ago, when the college was less than one-half its present size. The increase in the number of buildings and the multiplication and enlargement of departments have added materially to the demands upon this fund. The value of the college plant exceeds $1,000,000. An annual fund equivalent to 3 per cent of this sum would be none too large to keep the plant in order and provide the minor improvements necessary to successful work. The additional amount needed is included in the College askings:

PROVIDENTIAL FUND.

The College feeding sheds and experimental barn were destroyed by fire October 25, 1901. The remaining wing of the old main building was burned August 12, 1902. These fires brought serious financial embarrassment to the institution. The work of the experiment station required the immediate erection of new feeding sheds and the purchase of feed stuffs of the kind destroyed by the fire. The need of recitation rooms to take the place of those in the main building made necessary the erection of an addition to emergency hall within the three weeks intervening between the fire and the opening of the College year. The available means of the institution had been appropriated to other purposes and thus it was impossible to meet these emergency demands entirely from College funds. Appeals were therefore made to the Executive Council, with the result that after investigation appropriations were made from the Providential or Contingent Fund, amounting in all to $6,009.42, to meet these two emergencies. Of these appropriations the sum of $5,998.51 was drawn by the College and expended as follows:

Cost of feeding sheds	$ 1,750.00
Material and labor in building fences to replace those destroyed by fire	184.80
Feed stuffs and supplies	1,063.71
Part payment of contract price for erection of addition to emergency hall	3,000.00
Total	$ 5,998.51

PURE BRED STOCK APPROPRIATION.

This is the only remaining state appropriation, outside of the support funds, to be considered. The following exhibit of receipts and disbursements shows the funds available and the purposes for which they have been expended:

RECEIPTS.

Appropriation of Twenty-eighth General Assembly unexpended	$ 939.20	
Appropriation of Twenty-ninth General Assembly	5,000.00	
Total		$ 5,939.20

DISBURSEMENTS.

Horses:	
1 standard bred filly	$ 400.00
1 Clydesdale mare	300.00
1 saddle mare	400.00
Cattle:	
1 shorthorn cow and calf	510.00
1 Hereford cow and calf	500.00
1 imported Angus heifer	405.00
1 Angus calf	30.00
1 Jersey bull	200.00
Sheep:	
1 Shropshire ram	75.00
4 Shropshire ewes	150.00
1 imported Shropshire ram and Southdown ewe	200.00
2 Southdown ewes	40.00
3 Oxford ewes	79.10
2 Leicester ewes	80.00
Hogs:	
2 Berkshire boars	82.50
1 Berkshire sow	22.57
8 Berkshire pigs	40.00
2 Poland China boars	70.00
2 Duroc Jersey boars	80.00
2 Poland China sows	77.00
2 Duroc Jersey sows	50.00
1 Chester White boar	50.00
2 Tamworth boars	50.00

1 pure bred sow	$ 50.00	
Freight and express	191.94	
Telegrams	1.46	
C. F. Curtiss, expenses to Odeboldt, Kansas City, Monticello, Chicago and Springfield, Ill., to purchase stock	90.18	
Expenses of workmen caring for stock purchased	32.31	$ 4,257.06
Balance in hands of state treasurer		$ 1,682.14
Total		$ 5,939 20

EDUCATIONAL SUPPORT FUNDS.

The educational departments derive their support from the following sources:

1. Interest on national endowment fund.
2. Annual appropriation by national government.
3. Annual appropriations by the state.

INCOME.

The income for the last two years is as follows:

For 1901-1902:		
Interest on endowment fund	$ 38,253.93	
Morrill fund	25,000.00	
State appropriation	25,000.00	
Total		$ 88,253.93
For 1902-1903:		
Interest on endowment fund		36,728.51
Morrill fund		25,000.00
State appropriations	$ 60,000.00	
Less amount transferred to the repair and improvement fund	1,499.25	58,500.75
Total		$ 120,229.26

EXPENDITURES.

These expenditures, which represent the net cost to the state and nation of the maintenance of the educational departments, may be classified under the heads:

1. Instruction and administration.
2. Department expenses and equipment.
3. General expenses.

EXPENDITURES FOR 1901-1902.

1. Instruction and Administration:		
Salaries charged on salary roll	$ 45,248.43	
Salaries of assistants charged to departments	19,706.44	
		$ 64,954.87

2. Department Expenses and Equipments:			
Agricultural department	$	2,682 62	
Creamery		993.57	
Dairy		158.59	
Horticulture		1,394.16	
Veterinary science		498.21	
Mechanical department		1,171.70	
Civil engineering		1,790.82	
Physics and electrical engineering		1,149 89	
Mining engineering		531.04	
Military tactics		99.80	
General chemistry		271.17	
Agricultural chemistry		496.59	
Zoology		395.09	
Geology		299.43	
Botany		524.63	
Political economy		4.90	
English literature and rhetoric		334.31	
Domestic economy		296.31	
Music		101.54	
Library		1,997.96	
			$ 15,192.33
3. General Expenses:			
Public grounds	$	1,393.72	
Public rooms, heating, lighting and janitor service		1,389.69	
Sabbath services		451.94	
Contingent expenses		9,448.39	$ 12,683.74
Total			$ 92,830.94

The expenditures for the year exceeded the income by $4,577.01, thus reducing the cash balance to the credit of these support funds from $11,007.96 to $6,430.95.

EXPENDITURES FOR 1902-1903.

1. Instruction and Administration:			
Salaries charged on salary roll	$	51,137.48	
Salaries of assistants charged to departments		30,200.80	
			$ 81,338.28
2. Department Expenses and Equipment:			
Agriculture	$	2,731.24	
Agronomy		386.01	
Animal husbandry		1,102.70	
Creamery		1,487.00	
Horticulture		1,992.27	

Veterinary science	$	5 9.77	
Mechanical engineering		1,698.63	
Civil engineering		2,599.98	
Physics and electrical engineering		1,900.00	
Mining engineering		653.28	
Military tactics		99.82	
General chemistry		633 69	
Agricultural chemi-try		487.42	
Zoology and physiology		1 148 10	
Geology		489.05	
Botany		673.44	
Mathematics and secretary's office		214.74	
Political economy		24 00	
English literature and rhetoric		543.67	
Elocution and oratory		61.73	
French and German		72 55	
Domestic economy		349.93	
History and philosophy		100.00	
Music		410.39	
Library		3,241.67	
Total	$	23,621.08	
Less dairy credit		18.02	
			$ 23,603.06
3. General Expenses:			
Public grounds	$	1,497.34	
Public rooms, heating, lighting, janitor service and furniture		8,345.49	
Sabbath services		452.75	
Contingent expenses		9,004.69	$ 19,300.27
Total			$ 124,241,61

The expenses this year exceeding the income by $4,012.35 the cash balance was still further reduced from $6,430.95 to $2,418.-60.

In this statement of income and expenditures no account is taken of the income from department sales and from fees charged students. The amounts received from these sources are credited to the different departments and expended by them. Their omission from each side of the account does not affect the net expenditure, while in many cases it prevents misunderstanding as to the cost to the state and nation of maintaining a particular department. It does not follow because the debtor side of a department account, taken as a whole, is large that the cost of maintaining the department is a serious burden on the College income. It may be that the receipts are equally heavy. It

is the balance which counts. All departments of the institution are educational. It is not the purpose of the College authorities to make them self-sustaining. It is their aim, however, by good business management, to reduce the net cost of maintenance to a minimum. Wherever the commercial and educational idea can be combined this is done and the receipts from sales used to lessen the net expenses. It is with this same end in view, of reducing net expenses,that students are charged the cost of material used in the laboratories together with the expense of its preparation. The following table shows the receipts from sales and fees by the different departments during the last fiscal year:

Departments.	Sales.	Laboratory and shop fees.
Agriculture	$ 18,413 60	
Agronomy	68.15	$ 265.00
Animal husbandry	156.00	697.00
Creamery	6,537.50	
Dairy	4.25	1,094.85
Horticulture	861.94	81.00
Veterinary science	1,068.43	253.25
Mechanical engineering	1,910 18	2,712.05
Civil engineering	84.05	8.00
Physics and electrical engineering	10.65	876.90
Mining engineering	59.50	
Geology	35.80	
Military tactics	2.00	
Agricultural chemistry	257.47	363.84
English literature and rhetoric	8.70	
General chemistry	102.67	2,397.34
Zoology	26.02	408.67
Botany		709.35
Domestic economy	34.49	454.50
History and philosophy	1.69	
Library	5.16	
Total	$ 24,648.25	$ 10,321.75

In making up this table, laboratory and shop fees returned to the student for any reason have been deducted, which will cause the totals to differ from those in the treasurer's balance sheet. In addition to laboratory and shop fees students are charged a janitor's fee of $5.00 per term which is credited to the fires and lights account and helps to meet the expense of heating and lighting the college buildings. The revenue from this source last year amounted to $10,191.50. Adding this to the laboratory and shop charges, we have $20,513.25 as the total amount paid by students in the form of fees. As the laboratory fees have been materially increased during the present year this annual total will now probably approximate $30,000.00. These figures should have a bearing upon any proposition to increase, by legislative action, the charges against students.

The College support fund—after the salaries are deducted—is apportioned, at the beginning of each year, among the different departments. The expenditure of the amount appropriated is directed, in each case, largely by the head of the department. It is considered that he knows best the needs of the work under his charge. It is part of his duty to plan and direct the upbuilding of his department, and in the modern industrial institution especially, with its extensive material equipment, no man can do this to advantage unless he is permitted to determine the expenditure of the necessarily small sum allowed him for department purposes. The scientific specialist has special knowledge of apparatus, as well as books; whether in laboratory, shop or stock yard he can best decide as to the equipment he needs. He has every incentive to secure the most possible with his annual allowance. In many cases he is able to obtain prices which would not be quoted to the ordinary commercial dealer. In some instances valuable pieces of apparatus are furnished without cost to the College. Such gifts during the past year have amounted in value to several thousands of dollars.

In the purchase of standard supplies an endeavor is made to secure the lowest wholesale rate. Probably two-thirds or three-fourths of the purchases have in the past been upon this basis. In some instances, where the quantities purchased were small, the danger of waste and deterioration considerable, and the expense of distribution and delivery to the departments an item of importance, it was found that true economy favored the ordinary method of buying of the retail dealer.

In order to secure whenever practicable the benefits of joint purchase the trustees have established a purchasing committee which consists at present of the Secretary of the Board, the Treasurer of the College and Trustee McElroy. It is not the purpose of this committee to interfere with the judgment of the professors as to the lines of department expenditures. It aims to retain for the College, in making purchases, the benefit of his special knowledge of articles and dealers and to add thereto the advantages of buying in large quantities and under competitive bids. It awards contracts for stationery, printing, laboratory supplies, coal, lumber, tools, hardware, electrical supplies, oil, gasoline, pipe and fittings, and all other articles in which by consolidated purchases lower prices can be secured. The books and accounts of the College are kept in such itemized form as to fully exhibit the results attained. All bills are passed upon by

the Board of Audit before payment, and a committee of the trustees examine and report upon them at the close of each fiscal year.

SUPPORT FUND BUDGET FOR 1903–4.

The following are the appropriations from the support fund for the coming fiscal year:

1.	Instruction and Administration:		
	Salaries charged on salary roll	$ 59,491.66	
	Salaries charged department account	28,715.00	
			$ 88,206.66
2.	Department Expenses and Equipment:		
	Agriculture	$ 1,700.00	
	Animal husbandry	800.00	
	Agronomy	600.00	
	Farm mechanics	300.00	
	Soils	300.00	
	Creamery	2,000.00	
	Dairy	100.00	
	Horticulture	1,303.02	
	Veterinary science	520.00	
	Mechanical engineering	1,400.00	
	Civil engineering	1,700.00	
	Physics and electrical engineering	1,300.00	
	Mining engineering	550.00	
	Geology	300.00	
	Military tactics (including band)	230.00	
	English and rhetoric	450.00	
	Agricultural chemistry	180.00	
	Chemistry	650.00	
	Zoology and physiology	800.00	
	Botany	450.00	
	Mathematics	100.00	
	Political economy	50.00	
	Public speaking	70.00	
	History, psychology and ethics	100.00	
	French and German	150.00	
	Domestic economy	300.00	
	Music	100.00	
	Library	1,800.00	
			$ 18,303.02

3.	General Expenses:		
	Public grounds		$ 1,400.00
	Public rooms, heating, lighting and janitor service		10,000.00
	Sabbath services		450.00
	Contingent Expenses:		
	Secretary and stenographer for president's office	$ 1,560.00	
	Extra clerk hire for president's office	100.00	
	Clerk hire for dean and secretary's offices	1,530.00	
	Catalogues, printing, stationery and advertising	3,000 00	
	Telephone service	255.00	
	Ringing chimes	100.00	
	Proctors	250.00	
	Preceptress fund	150.00	
	Clerks in treasurer's office ($1,540 less $600 paid from fires and lights account)	940.00	
	Manual for chapel use	60.00	
	President's emergency fund	150.00	
	Advertising in Student	50.00	
	Advertising in Junior Annual	50.00	
	Advertising in Engineer	50.00	
	Advertising in Agriculturist	50.00	
	Address before college trustees	100.00	
	Annual fee of agricultural college association	15.00	
	Fund for attending teachers' and farmers' association	70.00	
	Insuring treasurer's balances	9.00	
	Harvest home excursion	150.00	
			$ 8,639.00
	Total appropriated		$ 126,998.68

The salary roll as fixed for the school year beginning September 1, 1903, is as follows:

A. B. Storms, president	$ 5,000.00
E. W. Stanton, mathematics and economic science, dean of junior college and secretary of the board of trustees	3,000.00
C. F. Curtiss, dean of agriculture and director of experiment station	3,000.00
J. R. Lincoln, military science	1,000.00
A. A. Bennett, chemistry	2,000.00
L. H. Pammel, botany, station botanist	2,000.00
G. W. Bissell, mechanical engineering	1,900.00
A. Marston, civil engineering, college engineer	2,000.00

J. B. Weems, agricultural chemistry, station chemist	$ 1,800.00
Miss Lizzie May Allis, French and German	1,300.00
L. B. Spinney, physics and electrical engineering	1,700.00
W. J. Kennedy, animal husbandry and vice director	2,250.00
S. W. Beyer, geology and mining engineering	1,800.00
A. B. Noble, rhetoric and English literature	1,800.00
H. E. Summers, zoology, station entomologist	1,800.00
A. M Newens, public speaking	1,500.00
G. L. McKay, dairying	1,800.00
O. H. Cessna, history and ethics, college chaplain	2.300.00
J. H. McNeall, anatomy and principles and practice of surgery	1,500.00
C. W. Gay, veterinary science, station chemist	800.00
W. H. Meeker, mechanical engineering	1,800.00
L. E. Ashbaugh, civil engineering	1,500.00
Frank French, civil engineering	1,100.00
B. S. Lanphear, physics and electrical engineering	1,400.00
Mrs. M. H. Kilbourne, preceptress	900.00
Dr. W. E. Harriman, college physician	1,100.00
Receives in addition $300 from college hospital fund.	
Maria M. Roberts, mathematics	1,100.00
P. G. Holden, agronomy and vice dean of agriculture	2,000.00
H. W. Dow, mechanical engineering	1,400.00
H. Knapp, college treasurer and recorder and station treasurer	1,450.00
Receives in addition $250 from college book department and $100 from fires and lights fund.	
A. T. Irwin, horticulture	1,200.00
W. J. Rutherford, animal husbandry	1,200.00
C. J. Zintheo, farm mechanics	2,000.00
W. H. Olin, farm mechanics	1,200.00
W. H. Stevenson, soils	1,400.00
M. Jacobs, veterinary science	1,200.00
Walter Stuhr, veterinary science	1,200.00
E. M. Bugbee, mining engineering	1,400.00
B. H. Hibbard, economic science	1,000.00
Lola A. Placeway, chemistry	1,000.00
Bessie B. Larrabee, English	900.00
Elizabeth McLean, English	900.00
Total salaries listed on salary roll	$ 68,600.00

Houses on the college grounds are occupied by President Storms, and Professors Curtiss, Holden, Noble, Summers, Stanton, Weems, Marston, Bissell and McKay. Their annual rental value is fixed by the board at $200.

The total salaries on the salary roll are divided between the support funds and the Experiment station fund as follows:

Support funds	$ 60,137.50	
Experiment station fund	8,462.50	
Total		$ 68,600.00

The following are the amounts charged against the station:

C. J. Zintheo	$ 800.00	
W. H. Olin	600.00	
W. H. Stevenson	700.00	
C. W. Gay	400.00	
W. J. Rutherford	600.00	
L. H. Pammel	300.00	
C. F. Curtiss	800.00	
P. G. Holden	1,000 00	
W. J. Kennedy	1,150 00	
Herman Knapp	250.00	
J. B. Weems	900.00	
H. E. Summers	300.00	
A. T. Erwin	662.50	
Total		$ 8,462.50

The Agricultural department at Washington, because of its interests in some of the animal husbandry experiments, contributes $1,200 annually toward the salary of the head of the animal husbandry section.

It will be noticed that the salary totals for both the support fund and the station, as here given, differ slightly from the totals which appear in the expense budget of these funds. This is due to the fact that the fiscal year begins July 1st, while the school or salary year begins September 1st. The full effect of changes in salaries is therefore not shown in the fiscal year in which the change is made.

The following is the list of the instructors and assistants for the school year beginning September 1, 1903, with the salary of each and the fund from which it is paid:

Instructors and Assistants.	Experiment station.	Support funds.	Total.
David M. Fyffe, farm foreman		$ 1,000.00	$ 1,000.00
Wayne Dinsmore, animal husbandry (receives $100 additional from Fellowship fund)	$ 100.00	400.00	500.00
G. I. Christie, soils	300.00	300.00	600.00
T. S. Hunt, agronomy, paid by U. S. government	....	....	....
E. E. Little, horticulture	700.00	100.00	800.00
E. J. Erdmann, gardener		600.00	600.00
W. W. Otto, horticulture		300.00	300.00
M. L. Merritt, horticulture		800.00	800.00
C. Larson, dairy	500.00	500.00	1,000.00
F. W. Bouska, dairy, one-half year (receives $400 additional from receipts of dairy department)		200.00	200.00
R. R. Watkins, J. A. Holder, } Agricultural chemistry		500.00	500.00
C. E. Ellis, J. H. Frandson, } Agricultural chemistry	600.00		600.00
M. P. Cleghorn, mechanical engineering		800.00	800.00
R. H. Hadfield, mechanical engineering		600.00	600.00
E. C. Potter, mechanical engineering		800.00	800.00
J. G. Hummel, mechanical engineering		850.00	850.00
J. H. Lawton, mechanical engineering		480.00	480.00
J. A. Knesche, mechanical engineering		800.00	800.00
H. Otis, mechanical engineering		480.00	480.00
J. E. Stewart, civil engineering		600.00	600.00
E. B. Tuttle, physics and electrical engineering		800.00	800.00
F. Wenner, physics and electrical engineering		800.00	800.00
G. N. Mereness, physics and electrical engineering		300.00	300.00
H. M. Parks, mining engineering		600.00	600.00
Other assistants, mining engineering		300.00	300.00
Julia Colpitts, mathematics		900.00	900.00
E. A. Pattengill, mathematics		900.00	900.00
Annie Fleming, mathematics		600.00	600.00
W. M. Jones, mathematics		600.00	600.00
Other mathematic assistants		580.00	580.00
F. O. Elgott, chemistry		600.00	600.00
R. C. McKinney, chemistry		350.00	350.00
J. S. Coye, chemistry		500.00	500.00
R. E. Buchanan and others, botany	180.00	550.00	730.00
Harriet Kellogg, botany	300.00	810.00	810.00
Grace I. Norton, German		700.00	700.00
Florence Lucas, French and German		600.00	600.00
Helen Read, English		700.00	700.00
Beryl Hoyt, English		600.00	600.00
Effie J. White, English		600.00	600.00
Rose Abel, English (receives $50 additional from current expense fund of department)		100.00	100.00
J. E. Guthrie, zoology		900.00	900.00
entomology section	600.00	....	600.00
Sadie Hook, public speaking (receives not to exceed $300 from current expenses of department)		400.00	400.00
C. M. Perrin, history		800.00	800.00
Mae Miller, history		600.00	600.00
Alice Merritt, domestic economy		800.00	800.00
Frances F. Williams, domestic economy		800.00	800.00
Ruth Morrison, domestic economy		600.00	600.00
Mary Van Zyle, domestic economy		100.00	100.00
F. J. Resler, music		400.00	400.00
Elizabeth Resler, music		100.00	100.00
Vina E. Clark, library		850.00	850.00
Olive E. Stevens, library		600.00	600.00
Other assistants, library		225.00	225.00
Charlotte M. King, artist	720.00		720.00
Totals	$4,000.00	$28,715.00	$32,715.00

EXPERIMENT STATION FUND.

The Experiment station is supported in part by the national government and in part by the State. It was established by an act of Congress approved by the President March 2, 1887. An annual appropriation of $15,000 was made for its support. The scope of its work was clearly defined by law. No portion of its income can be used by the educational departments of the College, but it must all be devoted to experimentation bearing directly upon agricultural interests. The law has been strictly obeyed by the trustees. The question has never been one of a surplus in the station treasury, but rather how to obtain for the station the additional amount needed to carry forward its legitimate work. It has been compelled to forego many experiments and seriously limit others because of want of funds. With the exception of a few meagre appropriations from the College support funds it has had no other source of income than the congressional appropriation until during the last fiscal year. The legislature of 1902 voted it an annual fund of $10,000. This gives it an income of $25,000. It uses also the receipts of the department from sales and other sources. The following statement shows the receipts and disbursements on account of the fund during the biennial period:

RECEIPTS.

Cash on hand July 1, 1901		$ 53.59
United States appropriation for the two years		30,000.00
State appropriation for 1902-1903		10,000.00
Sales for 1901-1902	$ 4,284.53	
Sales for 1902-1903	4,835 71	
Contribution from *Wallaces' Farmer*	200.00—	9,320.24
Total		$49,373.83

EXPENDITURES.

Expenses for 1901-1902 as per schedule	$18,545.68
Expenses for 1902-1903 as per schedule	28,684.23
Cash on hand June 30, 1903	2,143.92
Total	$49,373.83

The following is the schedule of expenses for the two years:

EXPENDITURES.

For What Purpose.	For fiscal year 1901-1902.	For fiscal year 1902-1903.
Salaries	$ 6,432.99	$ 8,473.94
Labor	4,126.69	5,827.36
Publications	843.92	1,914.53
Postage and stationery	620.50	1,084.34
Freight and express	418.50	589.82
Heat, light, water and power	225.50	461.45
Chemical supplies	77.28	493.80
Seeds, plants and sundry supplies	666.68	1,817.34
Fertilizers	19.54	15.00
Feed stuffs	2,002.42	2,907.33
Library	10.00	14.60
Tools, implements and machinery	490.83	816.80
Furniture and fixtures	3.50	217.35
Scientific apparatus	562.26	729.81
Live stock	1,614.01	2,012.95
Traveling expenses	372.09	538.31
Contingent expenses	15.00	19.50
Building and repairs	43.97	750.00
Total	$18,545.68	$28,684.22

The cash balance on hand has been placed to the credit of the director's fund and will be used largely to pay old bills. The income for the next year has been divided as follows:

Salaries as already specified	$12,394.98	
Less amount paid by United States Agricultural Department	1,200.00	
		$11,194.98
Animal husbandry	$2,500.00	
Agronomy	2,000.00	
Botany	516.25	
Entomology	527.50	
Horticulture	1,777.50	
Veterinary	488.75	
Dairy	500.00	
Soils	550.00	
Farm Mechanics	500.00	
Chemistry	900.00	
Bulletins	1,995.02	
General expense	750.00	
Director's office, including stenographer	800.00	
		$13,805.02
Total		$25,000.00

The station stands in urgent need of additional funds. The field of experimentation in which it can be useful to the agricultural interests of the state is rapidly widening. There is much work to be done and the money spent in the doing of it will be repaid many times to the state. The College asks that the annual support fund of the station be increased in the sum of $50,000. It also asks that an annual appropriation of $15,000 be granted the engineering departments for experimental purposes. The urgency of both these needs is fully set forth in the report of President Storms.

MINOR SOURCES OF INCOME.

Aside from the funds furnished by the state and national governments the College has few sources of income. They may be summarized as follows:

1. Rental of Rooms: The College owns a couple of young men's boarding cottages containing in all about forty rooms; a number of rooms in the second story of the creamery building are occupied by students; and in Margaret hall there are rooming accommodations for about one hundred young women. Rental is charged upon these rooms at $3.00 per term for each student. The fund is largely used to keep these student rooms in repair.

2. Students graduating from any of the College courses are charged a diploma fee of $5.00. The amount received pays for the diplomas and helps to meet the expense of keeping the students' records.

3. Two small tracts of land donated to the College at the time of its organization are still owned by the institution. A small income is derived from their rental. This income is used to meet small emergency items of expense.

4. Agricultural Fellowship Fund: Certain cash prizes are offered by Clay, Robinson & Company in connection with the Annual International Live Stock Exposition in Chicago. It is specified that agricultural colleges winning any of these prizes shall use the money received in establishing fellowships to be awarded graduate students in animal husbandry. The College received from this source during 1901 and 1902 the sum of $590.00.

5. Tuition charged students living outside of the state: Under a law adopted by the trustees on December 20, 1901, stu-

dents living in other states than Iowa are charged $12 per term tuition. The money collected is used for general purposes. The following shows the receipts and disbursements on these miscellaneous accounts during the biennial period:

RECEIPTS.

Rental of rooms	$ 4,404.98
Diploma fees	755.00
Rental on donated lands	63.80
Agricultural fellowship fund	530.00
Tuition paid by outside students	912.00
Total	$ 6,665.78

DISBURSEMENTS.

Room Rent:		
Repairs on Margaret hall	$ 519.33	
Repairs on cottages	289.25	
Repairs on office building	425.08	
Repairs on other buildings	973.30	
Part of salary of custodian of buildings	550.00	
College carpenter	437.50	
Expenses in student hospital during typhoid fever epidemic in 1900	1,267.57	
		$ 4,456.63
Diplomas:		
Expense of diplomas, including lettering	$ 225.50	
Students record and classification cards and expense of recording student standings	361.33	
		$ 586.83
Agricultural Fellowship:		
Amount allowed N. C. Rew as graduate assistant		300.00
Tuition refunded		12.00
Total		$ 5,355.46

The excess of receipts of $1,310.32, added to the balance of $514.26 to the credit of these funds at the beginning of the biennial period, makes the present balance $1,824.58.

TREASURER'S BALANCE SHEET.

The following is a summary of the treasurer's cash account for the two years covered by this report:

CASH ACCOUNT 1901-1902.

GENERAL FUNDS.

Receipts.

Cash balance on hand July 1, 1901		$ 11,614.07
National support fund	$63,253.93	
State support fund	25,000.00	
State fund for improvement and repair	18,368.26—	106,622.19
State Funds for New Buildings and Equipment:		
Special appropriations	$45,772.68	
Building tax	48,038.63—	93,811.31
State appropriation for pure bred stock		909.20
Sales of departments and students' fees		33,318.56
Miscellaneous items, room rent, diploma fees and rent on donated land		2,852.30
Total		$ 249,127.63

Disbursements.

Maintenance of college departments	$ 92,830.94	
Buildings, repairs and improvements	111,845.17	
Pure bred stock appropriation	909.20	
Miscellaneous accounts, room rent, diplomas and agricultural fellowship	2,586.67	
Department sales and students' fees expended	33,318.56	
Total		$ 241,490.54
Cash on hand		7,637.09
Total		$ 249,127.63

CASH ACCOUNT 1902-1903.

GENERAL FUNDS.

Receipts.

Cash balance July 1, 1902		$ 7,637.09
National support fund	$61,728.51	
State support fund	60,000.00	
State fund for repairs and improvements	18,705.15—	140,433.66

State Funds for New Buildings and Equipment:		
Special appropriations	$ 15,241.45	
Building tax	103,629.60—	118,871.05
State appropriation for pure bred stock		3,347.86
Department sales and student fees		38,225.48
Miscellaneous items, room rent, diploma fees, rent on donated land, Agricultural fellowship and tuition from students outside of the s.ate		3,813.48
Total		$ 312,328.62

Disbursements.

Maintenance of College departments	$ 124,241 61	
Buildings, repairs and improvements		138,663.78
Pure bred stock appropriation		3,347.86
Miscellaneous items, room rent, diploma fees and agricultural fellowship accounts		2,968.79
Department sales and students fees expended		38,225.48
Total		$ 307,447.52
Cash on hand belonging to the general funds	$	4,881 10
		$ 312,328.62

The cash balance belongs to the following funds:

Interest fund	$	2,418.60
State appropriation		749.92
Donation fund		191.83
Diploma fund		301.97
Room rent		.78
Agricultural fellowship		230.00
Tuition		900.00
Railroad damages		88.00
Total	$	4,881.10

The foregoing does not include the Experiment station receipts and disbursement which for convenience of government inspection are kept in a separate ledger. They have been reported upon under the head of Experiment station.

The correctness of the treasurer's books is carefully verified. An account is kept with him by the secretary of the board who debits him with all moneys received from whatever source and credits him with the amounts paid upon the order of the Board of Audit. This account is compared with the treasurer's books at the end of each month and the balance checked. At the close of the year a committee of the trustees makes settlement with the treasurer and counts the cash on hand. In this connection an examination is made of the books and vouchers, and report

rendered to the trustees. An examination of the accounts is also made by the expert accountant of the Board of Control. The bond of the treasurer is fixed at $50,000.00. It is filed with the secretary of state.

PRESENT CONDITION OF COLLEGE FINANCES.

The income of the College and Experiment station for maintenance of departments, grounds and buildings is approximately $163,500.00. It is divided according to its uses, as follows:

For maintenance of Collegiate departments	$ 120,000.00
For maintenance of Experiment station	25,000.00
For maintenance of buildings	18,500.00
Total	$ 163,500.00

It is credited to the state and national governments as follows:

State:			
Educational support fund	$ 60,000.00		
Station support fund	10,000.00		
Repair and improvement fund	18,500.00	-$	88,500.00
Nation:			
Educational support fund	$ 60,000.00		
Station support fund	15,000.00	—$	75,000.00
Total			$ 163,500.00

It should be noticed that the income of the College, aside from the support fund of the Experiment station and the annual appropriation for the maintenance of buildings, is $120,000. The expenditures last year amounted to $124,241.61. The excess of expenditures over income resulted in a reduction in the cash balance of $4,012.35. In making up the expense budget of the present year, account had to be taken of the salary of the newly elected president, the cost of maintenance of the new departments of agronomy, soils and farm mechanics, the expense of heating, lighting and janitor service for the new buildings, and the absolutely necessary additions to the teaching force in several of the College departments. In order to provide for these demands the current expense appropriations of the departments were cut to the lowest possible figure, and all purchases of apparatus and equipment which could be postponed were set over into the next year. Despite these reductions, the expense budget amounts to $126,498.68. To meet this excess in expenditures it will be necessary, after exhausting the cash balance, to use some $4,000

of the support fund due July 1, 1904, in payment of the bills of the preceding quarter. This will reduce the amount available for the fiscal year beginning with that date and will, of course, unless relief is granted, bring serious disaster to the institution. The fact is, the College has outgrown its income. In 1891, when the attendance was 425 its income was $66,000. The enrollment in the long courses for the present year will exceed 1,500, while the attendance upon the short courses will probably reach 500, making a total enrollment of about 2,000. If the increase in income had kept pace with the increase in attendance. it would now amount to more than $250,000. Nor does experience show good reason for any marked decrease in relative expense as College attendance increases. With the developments in science and the marvelous progress made in its application to industry, the equipment and appliances that go with industrial education have become more varied and costly, while the instructing force in these schools of technology is largely composed of men who can command high salaries in industrial affairs. The College has had a remarkable growth in the last few years, and there is every reason to believe that its future development will be equally rapid. Its present necessities require a large increase of the support fund. The enlarged work of the immediate future makes this demand imperative.

The need of additional buildings and the necessity for an increase in the fund for repairs and improvements is of equal urgency with the demand for an increase in the support fund. The present condition of these different funds has been already presented. The whole question of College needs is discussed in detail by the President in his part of this report.

GRADUATES AND DEGREES.

The following table shows the number of students graduating in the different college courses during the past two years:

College Course.	First year June 1902.	Second year June 1903.
In the course in agriculture	9	16
In the course in the sciences relating to the industries	8	4
In the course in mechanical engineering	6	12
In the course in civil engineering	6	14
In the course in electrical engineering	6	17
In the course for women	11	13
In the course in veterinary science	18	4
In the course in mining engineering	1	2
Total	65	82

Appropriate degrees were conferred upon these graduates. At the commencement in June, 1902, the degree of Master of Science (M. Sc.) was conferred upon Ira A. Williams and Alice Ward Hess, and the degree of Master of Scientific Agriculture (M. S. A.) upon Arthur T. Erwin. In June, 1903, the degree of Scientific Agriculture was conferred on Chas. E. Ellis and Edgar C. Myers. Honorary degrees were conferred as follows: The degree of Master of Philosophy upon Robert B. Armstrong and W. T. Hornaday; the degree of Mechanical Engineer (M. E.) upon W. Clyde Jones and the degree of Civil Engineer (C. E.) upon M. J. Riggs.

THE COLLEGE PRESIDENCY.

Dr. W. M. Beardshear who entered upon his duties as President of the College on February 17, 1891, died August 5, 1902. Under his leadership the College was greatly prospered and his death brought sincere sorrow to the friends of the institution. The following resolutions were adopted by the board and ordered spread upon the records:

"Death in its busy rounds has removed from among us W. M. Beardshear, the beloved President of the Iowa State College, and in his demise we recognize the great loss this institution has sustained.

His eleven years as President of the College have been a period of growth and development unprecedented in its history. Under his wise administration it has kept pace with the rapid unfolding of scholastic and industrial education. His progressive spirit has been in the forefront of every movement for the education of the head and hand, while his practical common sense has stood for the conservation of all that has borne the test and proved efficatious in his field of usefulness.

He gave to the College his best and most conscientious efforts, and its upbuilding was his chiefest ambition. His every aim centered in its success, and he was ever ready to sacrifice his time, his energy and health itself to promote its welfare. His sympathies were large. He entered the lives of the students of the College and inspired a love of a higher and broader education, and imparted ambition and enthusiasm to the young people coming within the scope of his influence, preparing them for better manhood and womanhood.

Appreciating the valuable services he rendered this College during the years of his presidency,

Be it resolved, By the Board of Trustees of the Iowa State College of Agriculture and Mechanic Arts that in the death of Pres. W. M. Beardshear this institution has suffered an irreparable loss; that the cause of education loses one of its most distinguished and useful citizens, and the bereaved family a kind and devoted husband and father.

Resolved, Further, that we extend to the grief-stricken family our sympathy and condolence, and that these resolutions be spread upon the records of this board."

The following tribute was adopted by the faculty and entered in their minutes:

THE FACULTY TRIBUTE.

We, the faculty of the Iowa State College, moved by feelings of profound sorrow and deepest sympathy in the great loss of our lamented President, hereby unite in expression of the following appreciation:

The loss of an eminent leader in any rank of life is a misfortune of far reaching consequence, but the loss of a great leader of educational and moral forces is especially to be deplored. It rarely falls to the lot of any man to possess in such large measure the general esteem and confidence, and to impress so deeply for good, the lives of so many people of all classes, as were reached and influenced by Dr. Beardshear. No one could know him but to be better for his acquaintance. His genial personality, gentleness and strength, were ever a source of renewed energy and high endeavor. His labors as President of the Iowa State College were the crowning work of a fruitful life. Coming to the institution at a critical period, he rendered an eminent service which was the product of a master hand and genius. His personal achievements were of the highest order, but in addition he possessed that rare and essential quality of every great leader—the faculty of developing and stimulating the best that is in every one else.

The leadership of President Beardshear was in every way typical of a great life, such a life as Lowell characterized in the following lines:

All thoughts that mould the age begin
Deep down within the primitive soul,
And from the many slowly upward win
To one who grasps the whole.

The deep, silent forces and the earnest, exalted purposes that were the source of power in President Beardsher's life, were manifest in all his work. His plans, born of a large heart, a keen perception and intuitive mind, were always broad and progressive and typical of his inspiring faith, and his generous and magnanimous nature. His work was peculiarly original; striking in conception, and masterful in execution. Though entering a new field on assuming the duties of an executive of an agricultural and mechanical college, his broad sympathies with humanity, and his active interest in the industrial professions, enabled him at once to grasp the needs and understand the functions and purposes of the land-grant colleges so comprehensively and intelligently that he became the acknowledged leader in the ranks

of all similar institutions in America, and he was unanimously accorded the distinguished honor of the presidency of the National Educational Association, an honor never before conferred upon a citizen of Iowa or an officer of a land-grant college. It was his work more than that of any other man in his time that served to place industrial and practical education in its true light, and to command the respect and admiration of the educational forces of the world.

His prophetic vision, his keen perception and accurate analysis, and above all his sublime faith, were inspiring to all who came under the influence of his magic power, and his qualities of leadership were inherent and without effort.

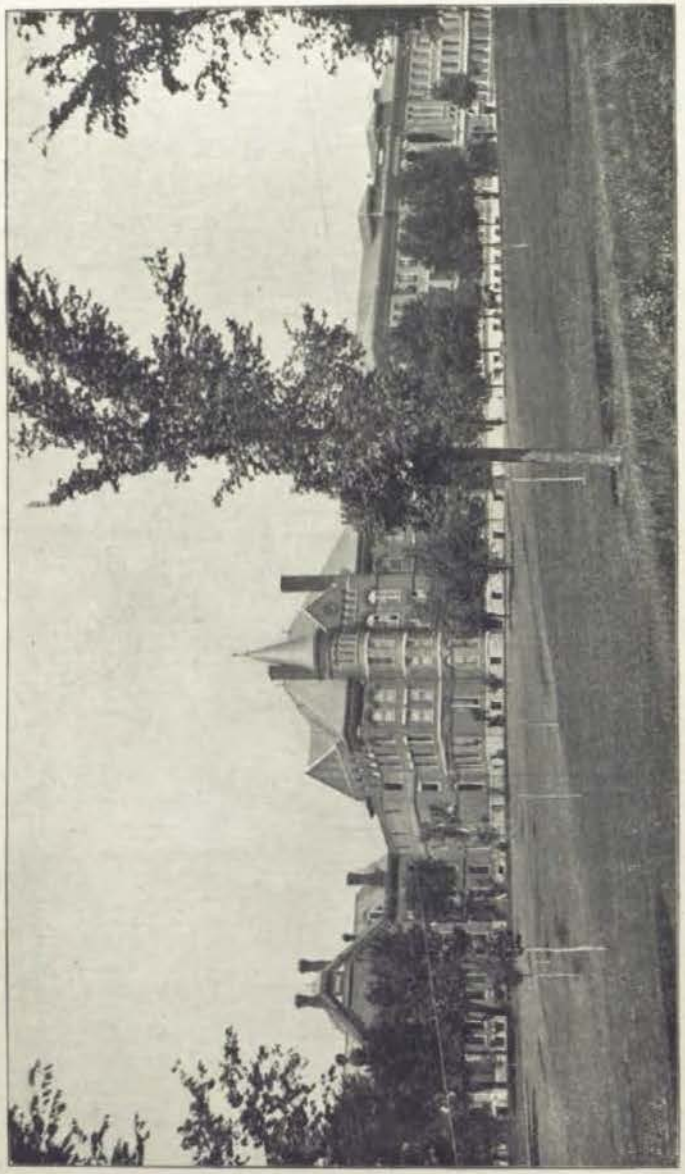
President Beardshear was an ideal leader and director of the efforts and work of his assistants, the faculty and instructors of this College. As a leader he foresaw the needs, secured the material means, and selected those who could best assist him in carrying out his plans. As a director of our efforts and work, he had the happy way of placing and inspiring confidence so that effort was united, and work was done without friction and with results fruitful along the lines he had laid down for the guidance of the institution to the permanent success which he desired.

To his associates he manifested the purest friendship and the noblest manhood; and more than leader and director, President Beardshear was a friend to each and all of us and his friendship was the reward most sought by his co-workers of the faculty, and furnished sufficient inspiration for untiring energy on our part during his life, and now strengthens and inspires us to carry on the task so well begun under his wise, energetic and friendly direction.

At the meeting of the Board of Trustees, held July 2, 1903, Dr. A. B. Storms was elected President. He comes to the head of the institution in the full vigor of his physical and intellectual manhood, cultured in the schools, and with a well-earned reputation as a public speaker. His heart is in the work, and under his administration the College looks forward to a prosperous future.

Respectfully submitted,

E. W. STANTON,
Secretary.



FOURTEENTH BIENNIAL REPORT

OF THE

IOWA STATE NORMAL SCHOOL

AT

CEDAR FALLS, IOWA.

SCHOOL YEARS 1900-1901 AND 1902-1903.

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