

14
DEPARTMENT OF THE INTERIOR
U. S. BUREAU OF EDUCATION

BULLETIN, 1916, NO. 19

STATE
HIGHER EDUCATIONAL INSTITUTIONS
OF IOWA

A REPORT TO THE IOWA STATE BOARD OF EDUCATION
OF A SURVEY MADE UNDER THE DIRECTION OF
THE COMMISSIONER OF EDUCATION



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BUREAU OF REVENUE

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OF IOWA

A REPORT TO THE IOWA STATE BOARD OF EDUCATION

BY THE COMMISSIONER OF REVENUE

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LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, August 21, 1916.

SIR: I am transmitting herewith for publication as a bulletin of the Bureau of Education the report of the survey of State higher educational institutions of Iowa, made under my direction for the Iowa State Board of Education by the following committee appointed by me for that purpose:

Dr. James R. Angell, dean of the faculties of liberal arts, literature, and science of the University of Chicago.

Dr. Kendric C. Babcock, dean of the college of arts and sciences of the University of Illinois.

Dr. Liberty H. Bailey, formerly director of the New York State College of Agriculture.

Dr. Hollis Godfrey, president of Drexel Institute, Philadelphia.

Dr. Raymond M. Hughes, president of Miami University.

Mrs. Henrietta W. Calvin, specialist in home economics, Bureau of Education.

Dr. Samuel P. Capen, specialist in higher education, Bureau of Education (chairman).

This report and the conclusions in the form of constructive recommendations were unanimously agreed upon by the members of the survey committee and approved by me.

The publication of this and reports of somewhat similar surveys made by this bureau should tend toward the establishment of more definite standards in the various fields of education and the formation of certain national policies which may gradually be adopted, always of course with necessary local modifications, throughout the country.

Respectfully submitted.

P. P. CLAXTON,
Commissioner.

The SECRETARY OF THE INTERIOR.

STATE HIGHER EDUCATIONAL INSTITUTIONS OF IOWA.

INTRODUCTION.

In the latter part of February, 1915, the Iowa State Board of Education requested the assistance of the United States Bureau of Education in the preparation of a budget for the three State higher institutions under the board's control. The invitation to the Commissioner of Education, in addition to rehearsing the recent history of the Iowa State institutions and suggesting the matters on which advice was desired, stated specifically:

That the State board of education has no desire to reopen the coordination question in the sense of combining the colleges of engineering and home economics as organized at the State University of Iowa and the Iowa State College of Agriculture and Mechanic Arts, or the abandonment of the college courses at the Iowa State Teachers College; but the Iowa State Board of Education would like to know whether it would be possible, without resorting to such radical action as mentioned above, to reduce duplications.

It was the board's expectation that the necessary examination of the institutions and study of their needs might be made during the academic year 1914-15.

The importance of the task, together with other engagements of the Commissioner of Education and his subordinates, made it seem unwise to undertake the enterprise within the period contemplated by the board. The Commissioner of Education was convinced that such an investigation should be made with due deliberation. He accordingly informed the board of his inability to assume the direction of it until the following autumn.

On May 15, 1915, a meeting of the board was held at Des Moines, which was attended by the Commissioner of Education and Dean K. C. Babcock, of the University of Illinois, special collaborator of the Bureau of Education. At this meeting formal sanction for the survey of the three State institutions was voted by the board and a memorandum furnished of the questions upon which information and counsel were especially desired. The following resolutions were passed:

Be it resolved, That the Iowa State Board of Education hereby requests Hon. P. P. Claxton, Commissioner of Education, to make a survey of the institutions of higher learning under this board, said survey to be made according to the plans suggested by the commissioner, who is hereby authorized to

employ such assistance as he deems necessary, the amount of compensation for such assistants to be agreed upon by the commissioner and the board; and

Be it further resolved, That the president of the Iowa State Board of Education and the finance committee be authorized to represent the board in all matters relating to the survey; and that the commissioner be requested to make a report of said survey, to the State board of education, not later than March 1st, 1916.

In its memorandum to the commissioner, the board requested that inquiry be made into the following matters:

1. The duplication in courses in education and psychology between the State university and the college of agriculture and mechanic arts.

2. The extent to which courses in liberal arts are offered at the Iowa State College of Agriculture and Mechanic Arts.

3. The advisability of giving courses in journalism at the State college of agriculture and mechanic arts and the desirability of establishing a school of journalism, with a recommendation as to its location.

4. The status of graduate work at each of the three State institutions, with the expression of an opinion by the investigators as to the possibilities of preventing duplication in this department.

5. The feasibility of consolidating the extension work of the three State-supported institutions.

6. The adequacy of the buildings, and the economy exercised in their use, at the State university, the State college of agriculture and mechanic arts, and the State teachers college. Specifically the opinion of the investigators was requested as to whether a general library and auditorium, or a botany and geology building, should be provided at the State university within the next biennium.

7. The best avenues of expansion of the State university and the State college of agriculture and mechanic arts, with special reference to the advisability of adding new colleges or departments to meet present or future educational needs of the State. The investigators were asked especially for a recommendation concerning the establishment of a college of commerce.

The Commissioner of Education believed that such an inquiry could best be undertaken by a group of persons whose training and experience would fit them to deal with general administrative problems in higher education in a constructive way, and who as individuals might respectively bring special knowledge to bear upon the definite questions raised in the board's memorandum. He therefore appointed, with the approval of the State board of education, the following persons to act as a survey commission:

Dr. James R. Angell, dean of the faculties of liberal arts, literature, and science of the University of Chicago.

Dr. Kendrick C. Babcock, dean of the college of arts and sciences of the University of Illinois.

Dr. Liberty H. Bailey, formerly director of the New York State College of Agriculture.

Mrs. Henrietta W. Calvin, specialist in home economics, Bureau of Education.

Dr. Hollis Godfrey, president of Drexel Institute, Philadelphia (consulting member).

Dr. Raymond M. Hughes, president of Miami University.

Dr. Samuel P. Capen, specialist in higher education, Bureau of Education (chairman).

The commission was organized in July. During the latter part of the summer certain of its members devoted themselves to the study of the printed material bearing upon the Iowa situation. The Bureau of Education furnished summaries of various documents and statistical compilations, which were circulated among the members of the commission.

The commission met on the 6th of October in the office of the Commissioner of Education at Washington and outlined the plan of the survey. In addition to the questions raised by the board of education in the memorandum already mentioned, it was determined to study with some care certain phases of administrative efficiency, especially those relating to the amount of teaching carried by members of the faculty, the size of classes, the standards of admission and promotion in the three institutions and their enforcement, and the machinery of general administration. Sanction for this extension of the field of the inquiry was found in the statement presented by the board to the Commissioner of Education in connection with its original invitation to him (mentioned in the first paragraph of this introduction) to undertake the survey. As essential to a proper estimate of the present status and future development of the State-supported institutions, the commission decided to consider the whole field of higher education in Iowa. The several topics to be studied were apportioned to subcommittees of the commission, the appointments to these subcommittees being based upon what was felt to be the peculiar aptitude of each member of the commission developed through previous administrative or teaching experience.

Before proceeding to study the institutions on the ground, the commission issued through the Bureau of Education detailed inquiries to the presidents, registrars, deans, and directors of the departments having to do with the questions under investigation. The material thus collected was summarized in part at the Bureau of Education and in part at the offices of the members of the commission who are not connected with the bureau.

The Bureau of Education also prepared a letter of inquiry concerning the educational needs of the State, which, through the cooperation of the State board of education, was sent to presidents

of chambers of commerce, heads of granges, newspaper editors, superintendents of schools, and certain other citizens of distinction. One hundred and forty-one replies were received. The text of the letter follows:

DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, October 18, 1915.

MY DEAR SIR: At the request of the Iowa State Board of Education the United States Commissioner of Education has appointed a survey commission to make a report upon the conditions and needs of the three State-supported institutions of higher education in the State of Iowa.

It would be of great assistance to the commission to learn from representative citizens and from influential organizations the opinion of the State regarding the efficiency of organization and management of these institutions, the wisdom of their educational policies, the possible avenues of waste through unnecessary duplication, and the most profitable lines for their future development. I therefore take the liberty of asking you to address to me, for the benefit of the commission, a brief statement which will cover the following points:

1. In your judgment is each of the three higher institutions occupying fully and exclusively the sphere which properly belongs to it?
2. Are there general defects in policy or management of any one of the institutions which have prevented its proper development or disturbed the balance which would prevail between three State schools founded for three distinct purposes?
3. Do you think it desirable to maintain the State institutions of higher education on a sound and generous basis, providing from time to time for their physical expansion to keep pace with the increasing complexity of higher education and with the possible growth of the State?
4. Would you suggest any new activities, directly or indirectly, for the benefit of the people of the State which any one of the institutions should take up?
5. In your opinion what occupations and industries promise to be most important to Iowa in the near future? Is there already ample provision for training in these lines; or should the State-supported higher institutions give special attention to the development of training in some of them?

The commission desires the frankest expression of opinion on these subjects and on any others that you may care to discuss. Your communication will be regarded as strictly confidential.

May I urge you to reply in the inclosed penalty envelope not later than November 1st.

Sincerely, yours,

P. P. CLAXTON, *Commissioner.*

In issuing the letter the commission had two ends in view. First, it desired to ascertain the attitude of leading citizens of the State toward the State's higher institutions, to construct for itself the atmospheric setting of these institutions. Second, it wished to secure the opinion of those citizens of Iowa best informed and best qualified to speak concerning the probable future development of the State and the new or enlarged educational facilities which this development might demand. Both of these purposes were achieved. Most of the replies were conscientiously prepared. Taken together, they

have not only cast much light on the whole higher educational situation, but they have revealed in a striking way the spirit of the State. A few of the replies are truly notable documents.

The period from November 8th to November 19th was devoted by the commission to visiting the institutions. President Godfrey was represented in this part of the work by Mr. H. T. Murray, of Drexel Institute. The commission spent four days at Iowa City, two at Cedar Falls, and five at Ames. The procedure during these visits was in brief as follows:

After a preliminary view of the grounds and buildings the members of the commission separated and individually or in groups of two interviewed the principal officers of each institution, including as many heads of departments as possible. Certain of the members examined with care the educational and financial records and all documents relating to the use of buildings. At the State university and the State college of agriculture and mechanic arts it held hearings attended by the presidents, deans, and certain heads of departments in these institutions. At the State teachers college it held a hearing attended by the president and the head of the department of education, who is also the director of study-center work. A stenographic report of each of these hearings was made and a copy given to the president of the institution concerned.

On the 17th of November the commission had an audience with Gov. Clarke, discussing with him the more important features of the educational situation. Subsequently the members called upon Supt. Deyoe and obtained from him a statement of the relations between the department of public instruction and the administration of the higher institutions of the State.

On the 18th of November the commission met with the State board of education in Des Moines and discussed certain of its observations and the scope of its report. The members pointed out to the board that, in their opinion, the commission should be allowed to exceed the definite limits originally laid down and to take up in its report other matters than those mentioned in the memorandum presented to the Commissioner of Education in May. While this memorandum had served thus far as a guide for the commission's inquiries and deliberations, nevertheless other issues had constantly obtruded themselves upon the attention of the commission—issues which the members had come to believe were fundamental to the situation, and which should be taken into account, if the report were to have any value. The board was convinced by the discussion that, to render the best service, the commission should be free to treat any parts of the educational situation in Iowa that might be necessary.

In accordance with this understanding, the commission has ventured upon a general consideration of the question of duplication. It was felt that recommendations could not consistently be made regarding the prevention of duplication in certain specified lines, particularly in the field of graduate work, without account being taken, at the same time, of the whole extensive area of duplication. The effort has been to show that almost all cases of duplication are symptoms of the same organic defect, and that these symptoms can not be permanently remedied by a series of small, palliative measures, but only by action designed to remove the defect itself. Certain principles are proposed which it is believed will, if applied, achieve the desired result. The commission is desirous of having the fact distinctly understood, however, that this wider discussion is undertaken wholly on the commission's own initiative, and that the consent of the board to the embodiment of it in the report was obtained only after the commission's investigations were practically finished. This statement is made in order that the position of the board in the matter may not be misconstrued.

The commission has not attempted to go into past institutional difficulties or to investigate questions of legality. The members have considered it their duty to judge educational conditions as they found them, to determine the status of each institution as now developed, and to recommend policies and administrative readjustments which they believe to be right in principle, which have the sanction of practice in other progressive States, and which the commission thinks will solve Iowa's most vexed educational difficulties.

To restore and preserve peace between the State higher schools, to facilitate a harmonious evolution of the State's higher educational system and of each of its parts—these are the ends which the State itself seeks. They are the ends which the commission has held constantly in view. If the commission's advice seems to the board and to the people of Iowa worth adopting, and if it is found that existing laws interfere with such adoption, the remedy is to change the laws; but the commission offers no definite recommendations as to legislation.

On the 19th of November the commission disbanded in Des Moines, two of its members visiting before their return certain of the officials of privately supported higher institutions in the State and three high schools of different types. The composition of the report, to which each member contributed one or more sections, occupied the following eight weeks. A brief of the findings of fact upon which each of the sections of the report was based was sent to the officers of each of the institutions with the request that any inaccuracies of statement be corrected. The facts, therefore, upon which the final

report of the commission rests have been attested by the persons best qualified to speak concerning them. For the interpretation of these facts, which is its chief business, the commission takes entire responsibility.

The commission met in Washington January 3, 4, and 5, 1916, discussed the final form of the report, and decided upon certain minor revisions.¹ The separate contributions were then edited and combined in a single document by the Bureau of Education.

It will, of course, be apparent to any student of education that the survey does not cover all matters of interest and importance relating to the management of the State higher institutions. Departmental organization, for instance, receives very limited treatment. The only phase of student life touched upon is the housing of women students. No attempt was made to estimate the quality of classroom instruction or the professional equipment and standing of members of the three faculties. Indeed, there are a score of topics which would doubtless offer profitable fields for investigation which the commission did not consider. Some of these are mentioned later (see pp. 112, 124). Several others upon which the commission gathered extensive data are not included in this report. The contents of the report, and in a general way the commission's investigations, were determined by two considerations. The first of these was Iowa's complex administrative problem, the problem of organizing the component parts of its higher educational system so that they will work cooperatively, harmoniously, without mutual interference, and with the minimum of waste for the common welfare of the State. The second was the board's memorandum, which raised certain definite questions upon which advice was desired. The commission now reports on each of these questions, although it has thought best to discuss them in a different order from that suggested by the board.

The commission takes this opportunity to record its grateful recognition of the courtesy and cordiality with which it has everywhere been met. Not only the members of the board of education and the finance committee, but also all the officials with whom it came in contact at each of the three institutions have manifested an eagerness to cooperate and a keen desire to spare it trouble or delay. The burden imposed by some of the commission's inquiries has been heavier than would probably be guessed by those not familiar with educational investigations. The principal weight of it has fallen on the recording and reporting officers, yet these officers have in every case gathered the information requested promptly and cheerfully. The frank and friendly spirit in which all three faculties have re-

¹ It is worth recording that the commission has never had a divided vote. Every recommendation in the report has been carried unanimously.

ceived the commission has transformed what might have been an arduous though interesting task into a delightful experience upon which every member of the commission will look back with satisfaction.

On February 15 and 16 the chairman and two other members of the commission met the State board of education in Des Moines and submitted a preliminary draft of the report. The purpose of this conference was to determine whether there appeared in the report any errors in statement of fact concerning those matters of which the board has special knowledge. A few minor changes in the phrasing of portions of the report were made as the result of the meeting, but no changes in the substance of the recommendations. No recommendations were added and none were eliminated.

On February 23 the report was submitted to the Commissioner of Education. As the result of a conference between him and two members of the commission on February 26 one recommendation was slightly modified.

On February 28 the chairman and two members of the commission met with the presidents of the three institutions in Chicago and put before them the same preliminary draft of the report which had been presented to the State board of education. The purpose of this conference was similar to that of the meeting in Des Moines on the 15th and 16th of the month. The commission wished to be sure that no misstatements of fact remained through inadvertence in the document. During the course of the conference the presidents were informed of the changes in phraseology adopted as the result of the earlier conference. In all cases these changes met with their approval. The presidents in turn suggested certain other modifications not affecting the structure of the report, which the commission was ready to adopt. In addition, it appeared that certain minor recommendations relating to the provisions for physical training for women at the State teachers college were based upon an erroneous conception of the actual conditions. These, together with the discussion relating to them in the body of the report, were eliminated.

On March 17, after the changes mentioned had been reported to the other members of the commission and had received their approval, the manuscript of the report was turned over to the Bureau of Education for publication as a bulletin of the bureau. A synopsis of the report was also prepared and, simultaneously with the appearance in print of the full document, was sent to the Iowa State Board of Education for publication in the daily press.

Chapter I.

HIGHER EDUCATION IN IOWA, WITH INCIDENTAL REFERENCE TO PUBLIC SECONDARY EDUCATION.

BOARDS AND STATE AUTHORITIES.

Control of public higher and secondary education in Iowa is vested in several boards and officials, whose functions are prescribed by act of legislature. These are the State board of education, created in 1909, the finance committee of the State board of education, the State superintendent of public instruction, and the State board of educational examiners. The State superintendent of public instruction is authorized by law to appoint a State inspector of normal training in high schools and private and denominational schools and State inspectors of graded and high schools. The State board of education appoints the State inspector of secondary schools, and cooperates with the institutions under its control in the appointment of a board on secondary school relations.

THE STATE BOARD OF EDUCATION.

The State board of education consists of nine members appointed by the governor for terms of six years and serving without compensation, save for a small per diem to cover the expenses of travel. It is charged with the government of the State university, the college of agriculture and mechanic arts, the teachers college, and the school for the blind, and its powers extend to the appointment of all officers and employees of these institutions and the fixing of their salaries. It directs the expenditure of all State money appropriated to the institutions, and submits biennially to the legislature estimates of appropriations needed for their future support.

FINANCE COMMITTEE OF THE STATE BOARD OF EDUCATION.

The board is assisted in its management of the State higher institutions by a finance committee of three, appointed by the board itself from outside its membership, which performs the functions of an executive committee of the board. The powers and duties of the finance committee are only vaguely defined in the act authorizing its appointment. Its members receive a salary of \$3,500 a year each, and are expected to devote all their time to duties assigned them in connection with the higher institutions. They are required to visit each institution each month and familiarize themselves with its work. The secretary of the committee acts as secretary of the board.

THE INSPECTOR OF SECONDARY SCHOOLS.

Shortly after its creation in 1909, the State board of education established the office of inspector of secondary schools. This official continues under the direction of the board the practice carried on for some years previously by the university. He is charged with the duty of visiting such high schools in the State as desire to be accredited¹ by the State higher institutions, and passes upon their equipment and standards.

THE BOARD OF SECONDARY SCHOOL RELATIONS.

The inspector of secondary schools is chairman of the board on secondary-school relations, consisting, besides himself and his assistants, of a member of the faculty of each of the three State higher institutions appointed by the president of the institution and approved by the State board of education. The board on secondary-school relations considers and submits to the faculties of the three institutions recommendations on all matters respecting the standards to govern the accrediting of schools. These recommendations become operative when approved by the three faculty bodies.²

STATE SUPERINTENDENT OF PUBLIC INSTRUCTION.

The State superintendent of public instruction, who presides over the department of public instruction, is appointed by the governor for a term of four years and receives a salary of \$4,000. This official has general supervision and control over the rural, graded, and high schools of the State and over all other State and public schools, except those under the direction of the State board of education or the State board of control.³ Among his legally prescribed duties are the classification of the various public schools and the formulation of suitable courses of study for them. As it relates to the high schools, this classification is especially important, for on it depends the right of three types of schools to claim State or district subsidies. Children of rural sections which do not maintain high schools may attend high schools in neighboring districts, the home district paying their tuition at the rate of \$3.50 per month. To collect this tuition

¹ An accredited school is one whose standards and equipment have been approved by the agents of a higher institution (generally the State university) and whose graduates are accepted for entrance by that institution without examination.

² In 1909 the State board of education appointed a committee of 15, representing the faculties of the three State higher institutions, to agree upon a common basis for the relationship between the public high schools and the State institutions. Upon recommendation of this committee, uniform entrance requirements were adopted for similar courses at all three institutions, and it was agreed that no one of the institutions should change its entrance requirements without notice to the others.

³ This body has charge of the institutions for the defective, delinquent, and invalided.

for outside pupils, a high school must be approved by the State department of public instruction. State aid to the amount of \$750 per annum is granted to high schools which maintain courses for the training of rural teachers satisfactory to the State superintendent of public instruction. The same amount is also granted to consolidated schools offering courses in agriculture, domestic science, and manual training which are approved by the State superintendent of public instruction.

INSPECTORS OF THE STATE DEPARTMENT OF PUBLIC INSTRUCTION.

To assist him in determining the eligibility of these three classes of schools for approval and to aid in the general work of supervision, the State superintendent of public instruction appoints, under the law, an inspector of normal training in high schools and private and denominational schools, also one and not to exceed three inspectors of graded and high schools.

STATE BOARD OF EDUCATIONAL EXAMINERS.

The State board of educational examiners controls the certification of teachers. It is composed of the State superintendent of public instruction, who acts as chairman, the president of the university, the president of the State teachers' college, and two other persons appointed by the governor for terms of four years. The acts defining the powers and functions of this board specify in some detail the procedure to be followed in the issuance of different classes of teachers' certificates. The board is authorized to accept graduation from regular collegiate courses in the State higher institutions and other institutions within and without the State judged of equal rank, as evidence that a teacher possesses the scholarship and professional fitness for a State certificate. For a first-class certificate, however, collegiate courses amounting to 14 hours in education and 6 hours in psychology are required.

SECONDARY EDUCATION IN IOWA.

The population of Iowa was 2,231,853 in 1900, and 2,221,755 in 1914. In the interval it has risen slightly and dropped again. Reports made to the Bureau of Education showed that there were 51,828 pupils enrolled in public and private high schools and in the preparatory departments connected with higher institutions in 1914. This represents a gain of approximately 18,000 in 14 years, without any gain—indeed in the face of a slight loss—in the population.

The rate of increase in secondary-school enrollment has also been substantially constant throughout the period. These facts are ex-

hibited graphically in the accompanying diagram (diagram 1), which shows the curve of secondary-school enrollment from 1895 to 1914 applied to the curve of population. All but a small portion of this

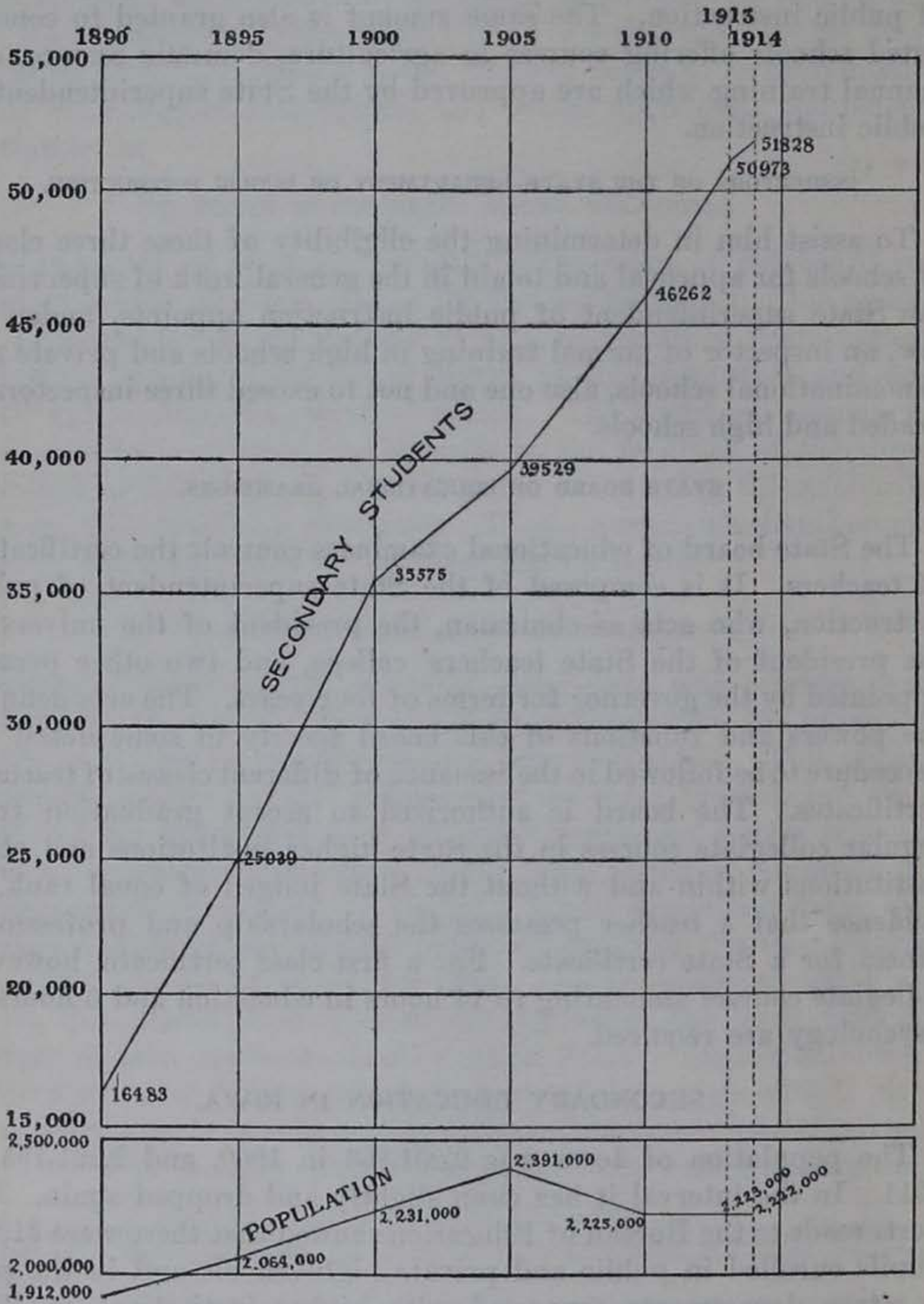


DIAGRAM 1.—Secondary students and population.

increased enrollment has occurred in the public high schools. In 1900, for instance, 13 per cent of the secondary-school pupils were in private secondary schools or the preparatory departments of

colleges; in 1914 only 11.5 per cent were in other than public secondary schools, the gain in enrollment during the 14 years being but 996.

It is also interesting to note that during the period from 1900 to 1914 there was a slight gain in the relative number of students in the graduating classes of secondary schools. In 1900, 12.9 per cent of

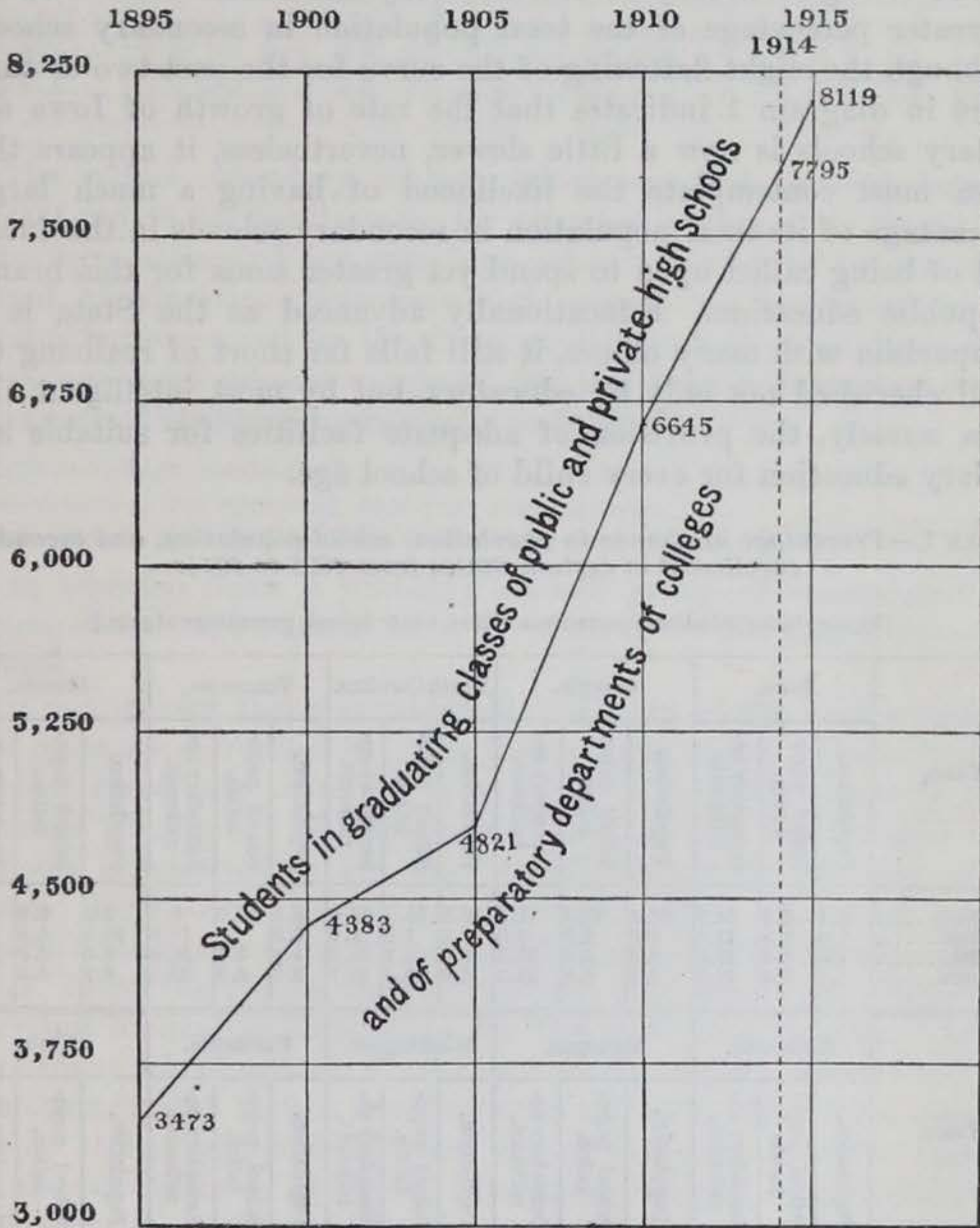


DIAGRAM 2.—Graduates of secondary schools.

the total secondary-school enrollment was in the senior year. In 1914 the percentage was 14.2. The curve illustrating the numerical increase in students in the graduating classes of secondary schools is shown in diagram 2.

The increase in public secondary education is not phenomenal.¹ Indeed the appended table (Table 1) indicates that a number of other States have outstripped Iowa in the rate of gain. Those States were selected for inclusion in the table which were known to have made considerable progress in secondary education in the past 15 years. But Iowa has an exceedingly large proportion of the total population receiving secondary education. Only one State—Utah—reports a greater percentage of the total population in secondary schools. Although the slight flattening of the curve for the past two or three years in diagram 1 indicates that the rate of growth of Iowa secondary schools is now a little slower, nevertheless, it appears that Iowa must contemplate the likelihood of having a much larger percentage of its total population in secondary schools in the future and of being called upon to spend yet greater sums for this branch of public education. Educationally advanced as the State is in comparison with many others, it still falls far short of realizing the ideal cherished not only by educators, but by most intelligent citizens, namely, the provision of adequate facilities for suitable secondary education for every child of school age.

TABLE 1.—Percentage of change in population, school population, and secondary enrollment in certain States from 1895 to 1914.

[Figures in italic indicate percentage of loss; other figures, percentage of gain.]

Years.	Iowa.			Georgia.			North Carolina.			Tennessee.			Illinois.		
	Population.	School population.	Secondary enrollment.	Population.	School population.	Secondary enrollment.	Population.	School population.	Secondary enrollment.	Population.	School population.	Secondary enrollment.	Population.	School population.	Secondary enrollment.
1895-1900.....	8.1	6.4	34.7	13.4	13.4	7.8	10.2	10.2	12.0	8.8	10.7	8.5	9.9	9.9	31.2
1900-1905.....	7.2	2.8	11.1	8.6	2.0	9.3	7.3	1.0	5.6	6.3	.7	15.6	10.3	6.8	19.8
1905-1910.....	7.0	7.0	17.0	8.5	3.4	35.2	8.6	2.1	54.6	1.8	1.5	51.6	6.0	3.8	32.7
1910-1914.....	.1	7.9	12.3	6.4	6.8	29.3	6.0	10.4	35.7	3.2	2.9	22.1	6.2	4.5	17.6

Years.	Minnesota.			Michigan.			Washington.			California.			Utah.		
	Population.	School population.	Secondary enrollment.	Population.	School population.	Secondary enrollment.	Population.	School population.	Secondary enrollment.	Population.	School population.	Secondary enrollment.	Population.	School population.	Secondary enrollment.
1895-1900.....	7.7	7.7	33.9	6.4	7.4	27.3	9.1	0.8	65.1	6.8	6.9	32.4	4.5	4.5	33.3
1900-1905.....	12.6	14.3	41.3	7.3	4.5	16.1	15.5	39.3	97.4	9.2	5.1	65.8	11.9	12.4	32.4
1905-1910.....	5.3	5.3	45.0	9.9	9.7	20.1	90.8	70.5	111.7	46.7	45.9	46.0	20.5	20.6	39.9
1910-1914.....	6.7	1.8	32.2	5.9	3.5	25.5	23.3	19.5	36.0	16.0	.73	47.4	11.0	1.1	34.7

¹ For curves of the secondary-school enrollment in Ohio, see Appendix.

TABLE 1.—Percentage of change in population, school population, etc.—Contd.

Years.	Massachusetts.			New York.			Ohio.			Connecticut.			Pennsylvania.		
	Population.	School popu- lation.	Secondary en- rollment.	Population.	School popu- lation.	Secondary en- rollment.	Population.	School popu- lation.	Secondary en- rollment.	Population.	School popu- lation.	Secondary en- rollment.	Population.	School popu- lation.	Secondary en- rollment.
1895-1900.....	13.4	13.4	26.7	13.7	13.8	62.4	9.8	9.8	33.5	13.3	13.6	26.2	8.2	8.2	33.4
1900-1905.....	10.2	7.0	24.9	8.7	5.8	21.7	5.8	1.3	16.9	8.9	6.1	14.7	8.3	3.0	28.2
1905-1910.....	9.0	6.0	18.3	15.3	9.4	30.4	8.3	7.6	6.6	12.7	12.5	31.8	11.0	4.5	31.2
1910-1914.....	7.1	10.6	24.1	8.6	8.9	24.2	5.5	10.5	16.1	7.9	8.1	38.4	7.6	8.6	33.8

The public secondary schools, which enrolled in 1914 between 45,000 and 46,000 pupils, may, for purposes of this study, be divided into three classes: Four-year high schools accredited by the State board of education; four-year high schools not accredited by the board, but approved by the State superintendent of public instruction, and high schools approved for less than a four-year course. These are distributed numerically as follows:

Accredited high schools.....	351
Unaccredited, but approved, four-year high schools.....	115
High schools approved for less than a four-year course.....	135

In addition there is probably a small group of unapproved and unaccredited high schools, some of which carry less than a four-year course.¹

It is apparent that a considerable majority of the high schools of the State are accredited by State higher institutions. The accredited schools enroll also, as might be expected, a disproportionately large number of pupils. The total enrollment in the unaccredited high schools is reported as less than 5,000.¹ About 90 per cent of the public high-school pupils are, therefore, now attending schools equipped to prepare for the best institutions of college grade. Moreover, 70 of the 115 as yet unaccredited four-year high schools are striving to qualify themselves for the accredited relation. Iowa's secondary school system, viewed as a whole, offers a channel between elementary and higher institutions remarkably free from obstruction. It has undoubtedly been one of the most effective agencies in the popularizing of higher education. Indeed, a mere statistical summary shows that the State has gone far toward the creation of a thoroughly coordinated State system of public education.

As has generally been the case throughout the United States, the public institutions which have received least material support and

¹ In spite of repeated requests made to the responsible officials, the commission has been unable to secure any accurate and complete numerical summary of the high-school opportunities in Iowa. It has been obliged to rely for many items on the returns made annually to the Bureau of Education.

the smallest amount of service from educational leaders have been the schools in small rural communities, both the elementary and the high schools. The commission has had no opportunity to study elementary education in Iowa. It has been able to give but slight personal attention to secondary education, but it is credibly informed that the lower schools generally have attained the least satisfactory development of any part of the State system. Next after them are the small country high schools, many of which maintain less than a four-year course and so can not be considered as in line for recognition through accrediting by the State higher institutions. These statements are in the main borne out by the statistical returns made to the Bureau of Education, which show that in elementary education Iowa does not hold the same high relative position as in the field of secondary education.¹

It was undoubtedly the apparent neglect of an important group of institutions which led the department of public instruction to undertake, in 1914, the task of inspecting the smaller high schools and approving those which were maintaining sincere and honorable standards and serving the peculiar local needs of their respective communities whether these schools were eligible to the accredited relation with the State higher institutions or not. The department approves one, two, three, or four-year high schools which meet the very moderate requirements proposed by it in respect to equipment, organization, curriculum, methods of instruction, and general spirit. But it does not restrict its inspection to unaccredited schools and those ineligible for accrediting; the accredited schools and the schools in the larger places are also included in the sphere of its operations.

There are, then, two different groups of recognized public high schools in Iowa,² judged by two different sets of officials using two different standards and responsible to two different authorities. The tendency of the State department of public instruction will naturally be to estimate schools according as they serve local needs, which will be perhaps increasingly vocational. The tendency of the State board's inspectors will quite as naturally be to consider high schools from the point of view of higher institutions. No school can, of course, be accredited unless it is equipped to give instruction in the subjects required for entrance by the State higher institutions.³

In this anomalous situation the stage is set for lack of harmony, misunderstanding, and eventual conflict. The fact that these evil results have not yet appeared does not remove the danger. The com-

¹ For summaries of school population, attendance, length of school year, per cent of total population undergoing elementary education, etc., see Report of the Commissioner of Education, Vol. II, p. 1 et seq., 1914.

² Mention is not made here especially of the high schools with normal-training classes.

³ These entrance requirements might be called conservatively progressive, by no means as liberal as those of some neighboring State institutions, and, on the other hand, more liberal than those of many eastern universities of similar standing.

mission would by no means advocate that all high schools be judged by the same criteria, or that no school be granted the encouragement of recognition by State authority unless it is equipped to prepare for college; but it considers the inspection of the same schools by different authorities offering contrary advice and holding up conflicting ideals of development to be a calamity for the smaller high schools and to exhibit a faulty governmental organization. Later in this report (see p. 125) various readjustments are suggested looking toward the coordination of the two types of inspection and standardization.

HIGHER EDUCATION IN IOWA.

Iowa is relatively well supplied with opportunities for secondary education. It is almost equally favored with facilities for higher education. The Bureau of Education has for several years listed 25 colleges and universities within the State. Forthcoming lists will add another to this number. In the report of this commission Iowa is therefore credited with 26 institutions of collegiate rank.¹ These are Buena Vista College, Central College, Central Holiness University, Coe College, Cornell College, Des Moines College, Drake University, Dubuque College, Ellsworth College, Graceland College, Grinnell College, Highland Park College, Iowa State College of Agriculture and Mechanic Arts, Iowa State Teachers College, Iowa State University, Iowa Wesleyan College, Leander Clark College, Lenox College, Luther College, Morningside College, Parsons College, Penn College, Simpson College, Tabor College, Upper Iowa University, and Wartburg College. The accompanying maps (maps Nos. 1 and 2) show their locations and the population of the State by counties according to the census figures of 1910.

The population of Iowa is evenly distributed. Not only is there little tendency toward an increase in density around the few larger centers, but there are practically no sparsely populated counties. In comparison with that of most other States, also, the population is remarkably homogeneous, intelligent, and prosperous. It is predominantly agricultural. These facts would of themselves tend to distribute the pull of higher institutions rather evenly over the State, if the institutions were located strategically so as to avail themselves of these favorable conditions. A glance at the maps, however, shows that the colleges and universities are concentrated in the eastern part of the State. Only four are located west of a line drawn north and south to pass just west of Des Moines. Indeed, 16, includ-

¹To be included in the college list of the Bureau of Education an institution must be authorized to give degrees; must have definite standards of admission; must give at least two years' work of standard college grade, and must have at least 20 students in regular college status.

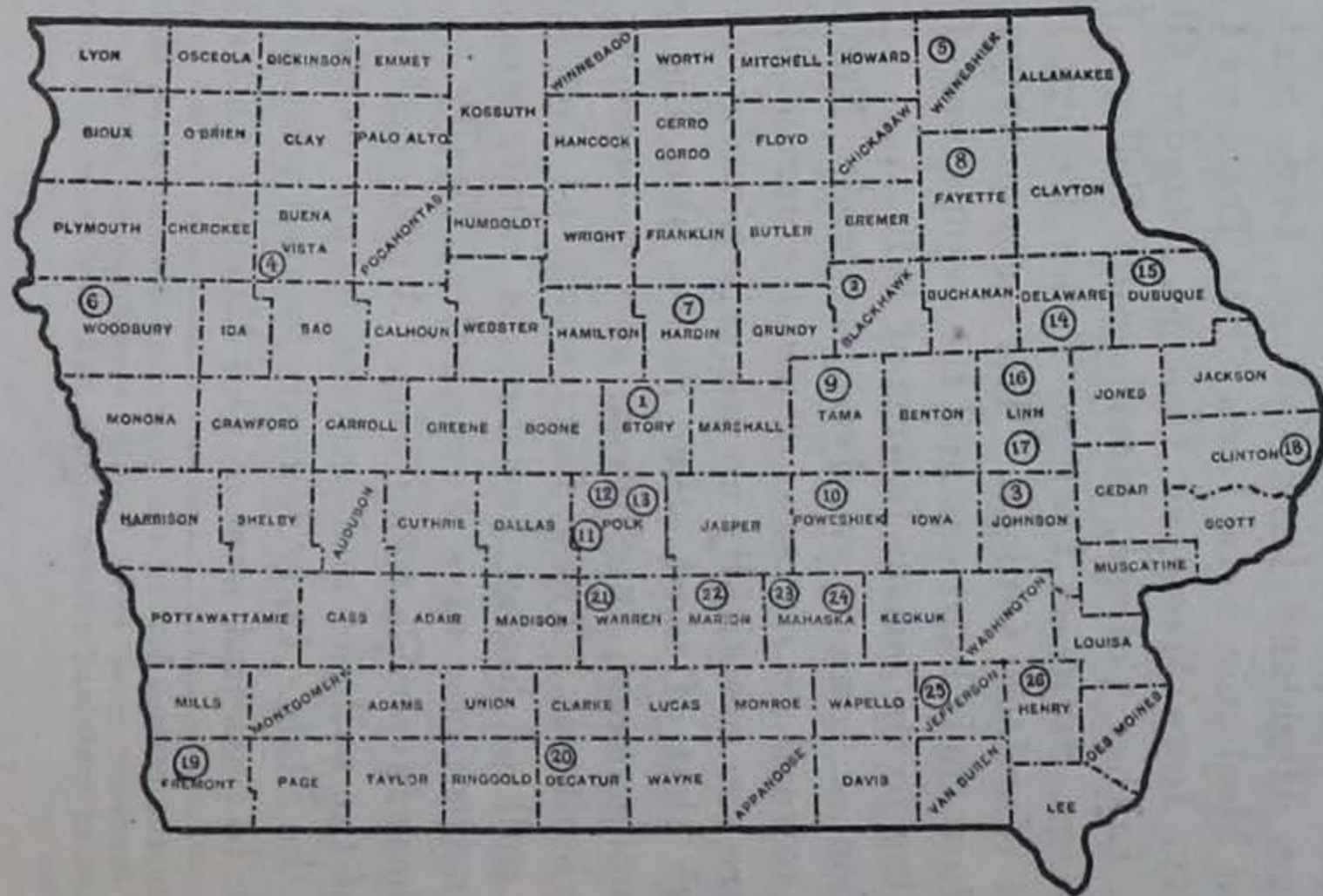
COLLEGES IN IOWA.

STATE COLLEGES.

1. Iowa State College of Agriculture and Mechanic Arts, Ames.
2. Iowa State Teachers College, Cedar Falls.
3. State University of Iowa, Iowa City.

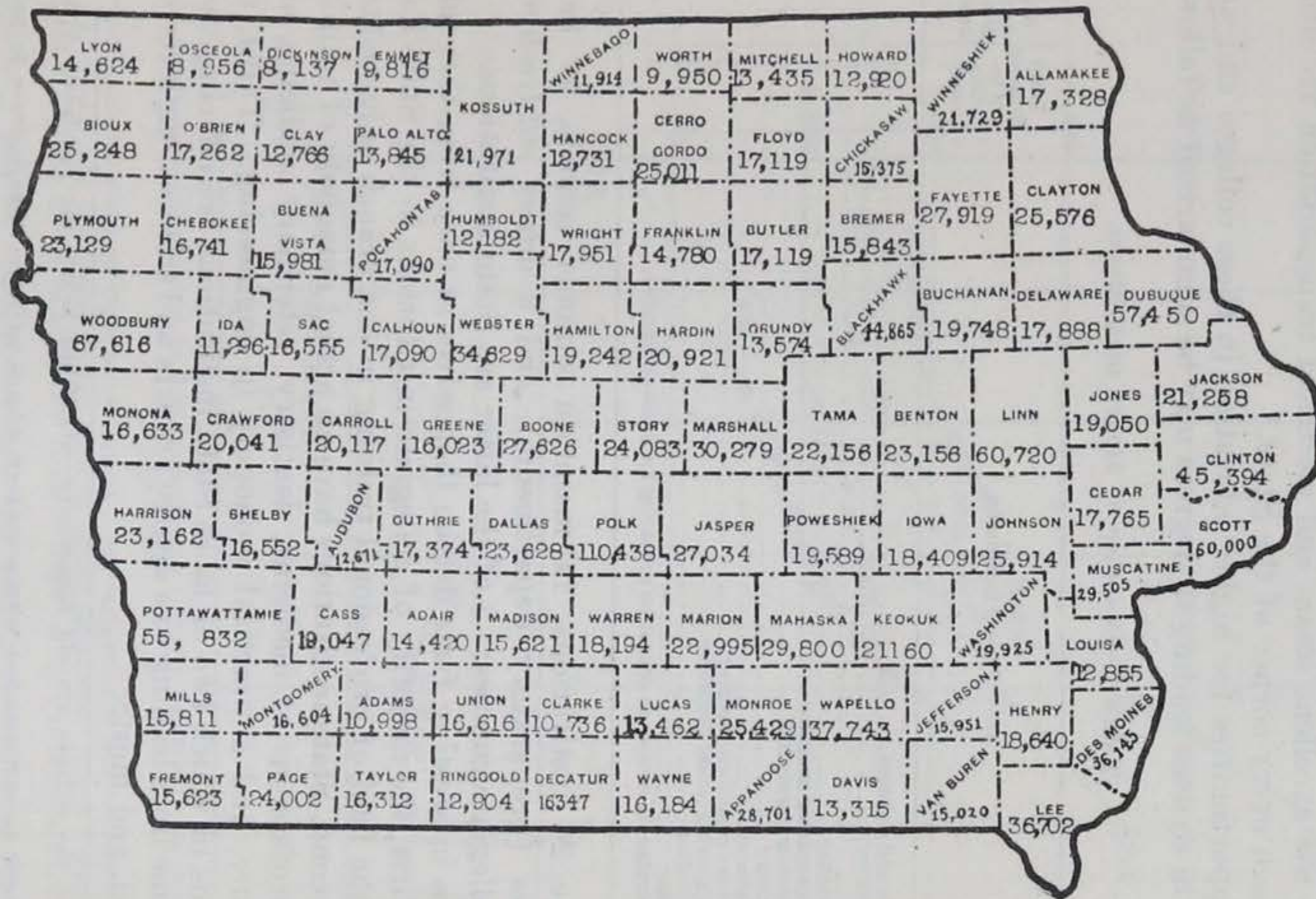
PRIVATE COLLEGES.

4. Buena Vista College, Storm Lake.
5. Luther College, Decorah.
6. Morningside College, Sioux City.
7. Ellsworth College, Iowa Falls.
8. Upper Iowa University, Fayette.
9. Leander Clark College, Toledo.
10. Grinnell College, Grinnell.
11. Des Moines College, Des Moines.
12. Drake University, Des Moines.
13. Highland Park College, Des Moines.
14. Lenox College, Hopkinton.
15. Dubuque College, Dubuque.
16. Coe College, Cedar Rapids.
17. Cornell College, Mount Vernon.
18. Wartburg College, Clinton.
19. Tabor College, Tabor.
20. Graceland College, Lamoni.
21. Simpson College, Indianola.
22. Central University of Iowa, Pella.
23. Central Holiness University, University Park.
24. Penn College, Oskaloosa.
25. Parsons College, Fairfield.
26. Iowa Wesleyan College, Mount Pleasant.



MAP 1.

Colleges and universities in Iowa. For population by counties, see Map 2, opposite.



MAP 2.

Population of Iowa by counties (for use in conjunction with Map 1, showing location of colleges and universities).

ing 4 of the largest, are in the southeastern quarter of the State. In other words, the location of Iowa colleges bears slight relation to centers of population. These facts have an important bearing, especially on teacher training, a question discussed later in this report. The somewhat serious geographical handicap which certain of the institutions suffer through the accident of their foundation is hardly offset by the excellent steam and electrical transportation facilities, which reach every corner of the State.¹

The opportunities for higher education in these colleges and universities in courses leading to degrees may be summarized as follows:

TABLE 2.—*Number of higher institutions.*

Type of institution.	Total number of institutions.	State institutions included.
Colleges of arts and sciences.....	26	3
Schools of theology.....	1	0
Schools of law.....	2	1
Schools of medicine.....	1	1
Schools of homeopathic medicine.....	1	1
Schools of veterinary medicine.....	1	1
Schools of denistry.....	1	1
Schools of pharmacy.....	2	1
Schools or courses of civil engineering.....	4	2
Schools of engineering (other branches).....	3	2
Schools of agriculture.....	1	1
Schools of music.....	5	2
Schools of education or courses in education preparing for State certificates.....	25	3

Of the 26 institutions, 14 maintain summer schools, 19 have academies (preparatory departments), and 3 others subfreshman or noncollegiate courses;² 2 of the latter are State institutions.

Certain interesting facts detach themselves at once from this summary: First, the majority of collegiate institutions in the State have entered the field of professional training in one branch only—education. Second, State institutions have an actual monopoly of training in the professions of medicine, dentistry, veterinary medicine, and agriculture, and a practical monopoly in engineering. Third, the only fields in which two or more State institutions are offering work in the same lines leading to a degree are arts and sciences, engineering, education, and music.

¹ Most of the colleges are old foundations established before the population became stable.

² In a State as well supplied with secondary schools as Iowa there appears to be no valid educational excuse for the continued existence of so many academic departments connected with private colleges. For the majority of these institutions this means a division of resources and a probable lowering of scholastic tone. That it is unnecessary in order to get properly trained students is evidenced by the fact that several of the strongest colleges no longer maintain academies. Moreover, only four academies are accredited by the State board of education as qualified to prepare students for the State higher institutions.

With one exception,¹ all the higher institutions of the State were founded before 1895, i. e., before the period of most rapid increase in the number of pupils in secondary schools. Reference to diagram 1 (covering the period from 1890 to 1915) shows that the curve of

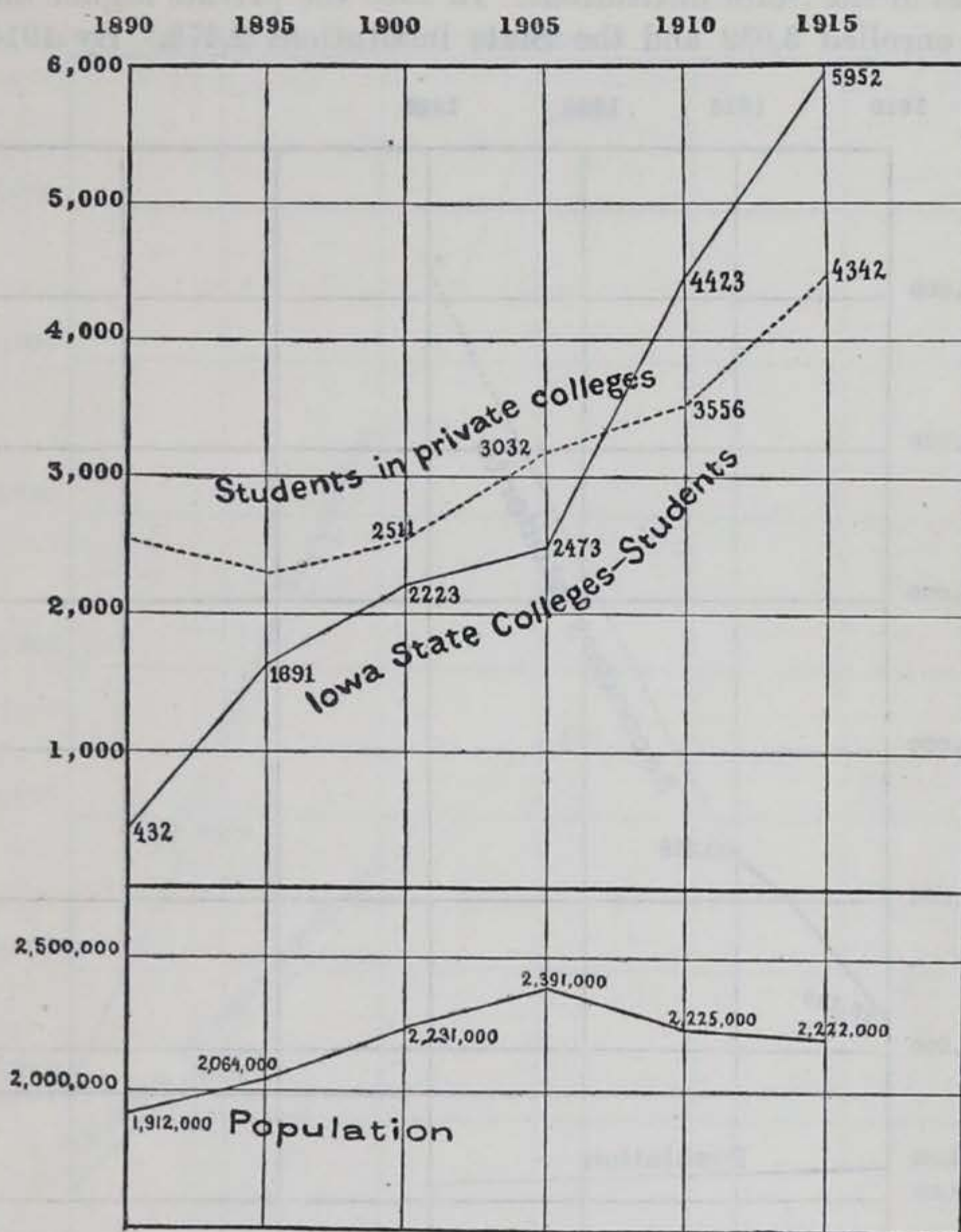


DIAGRAM 3.—Enrollment in State and private colleges, 1890–1915, in relation to population.

NOTE.—In this diagram there were several large variations which seemed to be due to errors in collecting the figures rather than to actual conditions. These points have been omitted in plotting the curve of private colleges: 1908—9,232; 1912—6,413; 1914—9,762.

secondary-school enrollment has the sharpest upward trend from 1895 to 1900. It is interesting to compare with these enrollment figures those of the collegiate institutions during the same period.

¹ Central Holiness University, founded in 1906, and enrolling 41 collegiate students in 1915.

² Highland Park College, which was not in the list of collegiate institutions of the Bureau of Education until the present year, is not included in summaries appearing in this chapter.

It appears that there were 2,254² students in the collegiate and professional courses (all preparatory and noncollegiate students having been eliminated from the returns) of all the privately-supported institutions in 1895, and 1,691 in the collegiate and professional courses of the State institutions. In 1905 the private higher institutions enrolled 3,032 and the State institutions 2,473. By 1914 the

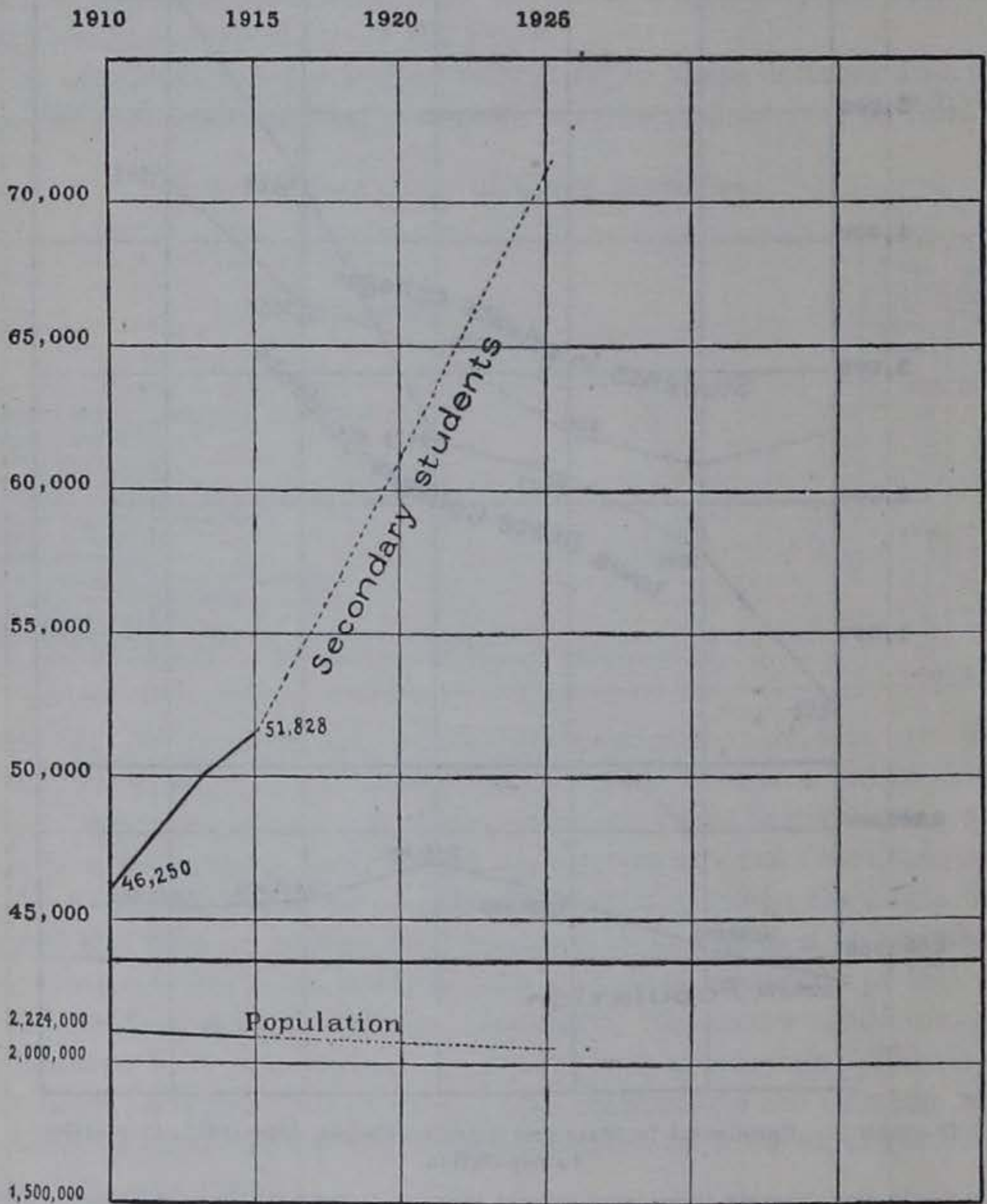


DIAGRAM 4.—Forecast of secondary school enrollment to 1925.

figures had grown to 4,342 for the private colleges, and 5,952 for the State colleges.¹ It appears that the most rapid upward movement

¹ Summer-school students are included in these figures and reduced to approximately a 36 week basis. Figures of the State board are used for State institutions since 1910. But attention is especially called to the fact that the figures on which both these curves and those in the diagrams are based do not include the large group of special, irregular, and noncollegiate students, all of which are reckoned by the higher institutions in their total enrollments.

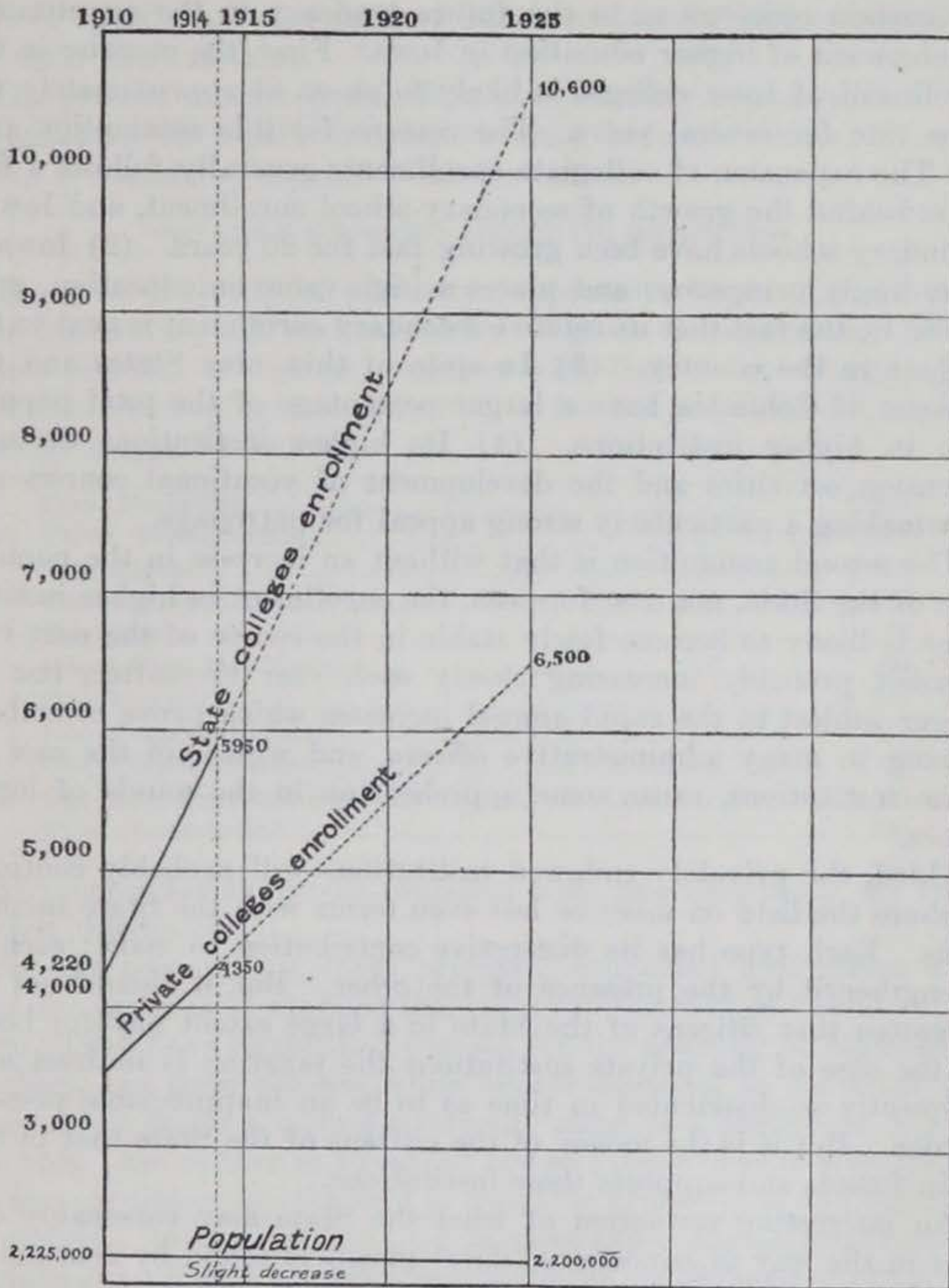


DIAGRAM 5.—Forecast of college enrollment to 1925.

For the enrollment in State colleges and private colleges since 1890, see Diagram 3, p. 27.

in both enrollment curves has taken place since 1905, the sharpest ascent being within the past five years. Both curves have kept close together, although there has been a slight relative gain on the part of the State institutions. Neither shows as yet a tendency to flatten.¹

* In view of these facts, the commission may be warranted in hazarding certain opinions as to the future tendency in the quantitative development of higher education in Iowa. First, the increase in the enrollment of Iowa colleges is likely to go on at approximately the same rate for several years. The reasons for this assumption are: (1) The expansion of collegiate enrollments generally follows a few years behind the growth of secondary-school enrollment, and Iowa's secondary schools have been growing fast for 20 years. (2) Iowa is exceedingly prosperous and places a high value on education, as is shown by the fact that its relative secondary enrollment is next to the highest in the country. (3) In spite of this, nine States and the District of Columbia have a larger percentage of the total population in higher institutions. (4) Its higher institutions through extension activities and the development of vocational courses are now making a particularly strong appeal for patronage.

The second assumption is that without an increase in the population of the State, not now foreseen, the enrollment in higher institutions is likely to become fairly stable in the course of the next two decades, probably increasing slowly each year thereafter, but no longer subject to the rapid annual increases which prove so embarrassing to many administrative officers, and which, in the case of State institutions, cause some apprehension in the minds of legislators.

Third, the privately endowed institutions will probably continue to share the field on more or less even terms with the State institutions. Each type has its distinctive contribution to make; each is strengthened by the presence of the other. But it should not be forgotten that citizens of the State to a large extent pay for both. In the case of the private institutions the taxation is indirect and frequently so distributed in time as to be an inappreciable present burden. But it is the money of the citizens of the State that in the main founds and supports these institutions.

→ An interesting revelation of what the State may reasonably expect in the way of educational development is found by continuing upward for the next 10 years the curves of secondary and college enrollment. According to this forecast the enrollment for 1925 would be approximately 68,000 in secondary schools, 9,900 in State higher institutions, and 6,500 in private colleges (diagrams 4 and 5).

¹ Interesting for comparison are similar enrollment curves for Ohio. See Appendix.

Of course, precisely the conditions indicated by these imaginary curves, especially the relative gain of higher over secondary institutions, may not occur, but undoubtedly the tendencies may be thus indicated. The inevitable conclusion is that, if it wishes to maintain its enviable educational position among the States, Iowa must prepare to spend increased sums of public money for higher education for some years to come.

The present relative positions of the privately supported and the State-supported higher institutions may be made clearer if each group is considered separately for a moment.

PRIVATELY SUPPORTED COLLEGIATE INSTITUTIONS.

The great majority of privately supported colleges of Iowa were founded and are still maintained by religious denominations. Their denominational affiliations, together with their total collegiate enrollments (excluding summer schools) for the year 1914-15, may be summarized as follows:

Five Methodist.....	1,350
Three Presbyterian.....	212
Two Baptist.....	288
Two Lutheran.....	168
One Roman Catholic.....	¹ 157
One Latter Day Saints.....	24
One Friends.....	166
One Congregationalist.....	¹ 19
One United Brethren.....	77
One interdenominational.....	41
Five nonsectarian.....	1,920

The nonsectarian group contains, with one exception, the three largest institutions.

As has been shown, these privately supported institutions have thus far practically confined themselves to the field of liberal education. They have established courses for the training of high-school teachers, but these courses, while semiprofessional in character and designed to fit for a calling commonly rated as a profession, are for the most part neither so advanced nor so extensive as to constitute a serious excursion into the field of scientific professional and technical education. Indeed, in Iowa, as in most other States, requirements for the high-school teacher's certificate do not demand professional training in the generally accepted sense of the term. The clientele of the privately supported colleges is therefore in the main made up of boys and girls seeking a college education of a liberal or general nature.²

¹ Figures of 1913-14.

² This statement applies only in part to Highland Park College and Drake University.

College education in institutions strongly denominational in tone, or at least predominantly religious in atmosphere, and of a comparatively small size, is securely entrenched in the regard of large groups of parents. The appeal of such institutions is often stronger than that of State colleges which may possess superior scholarly resources and equipment. The commission does not attempt to weigh the relative advantages of liberal training in the two types of institutions. It merely notes the fact. The patronage of the private college is affected in increasing measure by certain other considerations, however.

The first of these considerations is the ability of the institutions to enlarge their resources. No college can now be successfully run on fees alone. Higher education is becoming more expensive all the time. Appliances are now necessary which were not invented a generation ago. Libraries must be renewed and increased. Salaries are slowly but steadily advancing. To be assured of permanent existence and the power to draw students, a college must possess some endowment. Numerous agencies which study colleges have placed the minimum of productive endowment which an institution must have to insure permanency and efficiency at \$200,000.¹ In the near future even this amount will probably be insufficient. Of the privately supported colleges of Iowa, only 10 have endowment funds exceeding this minimum figure; 4 have no endowment at all. The endowments of the others range from \$25,000 to \$165,000. It is reasonable to expect that some of the institutions without endowment or with less than \$200,000 may find it advantageous to consolidate with others, to become junior colleges, or possibly to devote themselves to less expensive grades of educational work.²

The patronage of all but the strongest and best-equipped private colleges, or of those which serve a peculiarly cohesive sect, has been found to be sharply limited also by geographical considerations. Young people are prone to attend a college located in their own State. Moreover, most colleges draw the majority of their students from within a radius of 50 miles. Few institutions obtain any considerable percentage of their enrollments from outside a circle with a radius of 100 miles.³ Maps prepared by the officers of the Iowa colleges furnish confirmation of this well-recognized truth.⁴

The third factor affecting the enrollment in private colleges is the keen competition for students among the colleges themselves. In the majority of the thickly settled parts of the country—and doubtless in Iowa—the same area is canvassed annually by many institu-

¹ Exception is made of Roman Catholic institutions, whose teachers serve without salary.

² Graceland College has already become a junior college.

³ See General Education Board report 1902-1914, pp. 119 et seq.

⁴ For these maps see Appendix, p. 211.

tions. What are thought to be the chief attractions of each are diligently presented to prospective students. The colleges possessing the largest resources and exhibiting the most dynamic institutional life tend inevitably to draw more and more students and so to win an advantage, at least in point of numbers, over their less fortunate or less skillful rivals. In some quarters of the United States inter-institutional competition has already forced a few weaker institutions out of existence or has led to consolidations. Similar results may in course of time occur in Iowa.

The relations of Iowa private colleges to the secondary schools of the State are not in all cases as clearly defined as are those of the State higher institutions to the same schools. Nineteen colleges belong to the Iowa College Association, members of which agree to admit on certificate graduates of only those secondary schools within the State that are accredited by the State board of education. Six of these announce that they admit on certificate the graduates of schools accredited by the State board of education or by the North Central Association of Colleges and Secondary Schools. The other 13 announce that they admit graduates of accredited schools without explaining the term. Indeed, the catalogues of several of these institutions treat the subject of admission by certificate with less definiteness than might be wished. It is assumed, however, that all members of the Iowa College Association have the same standards of admission as the State institutions. The remaining four colleges are somewhat vague in their statements on this point.

The general impression gained from a study of the catalogues of the private colleges of Iowa is that there are at least two standards, of which the relations of the colleges to the secondary schools may serve as the indices. One, the higher, is the standard set by the State institutions and scrupulously observed by some of the private colleges. The other is something less severe than this.

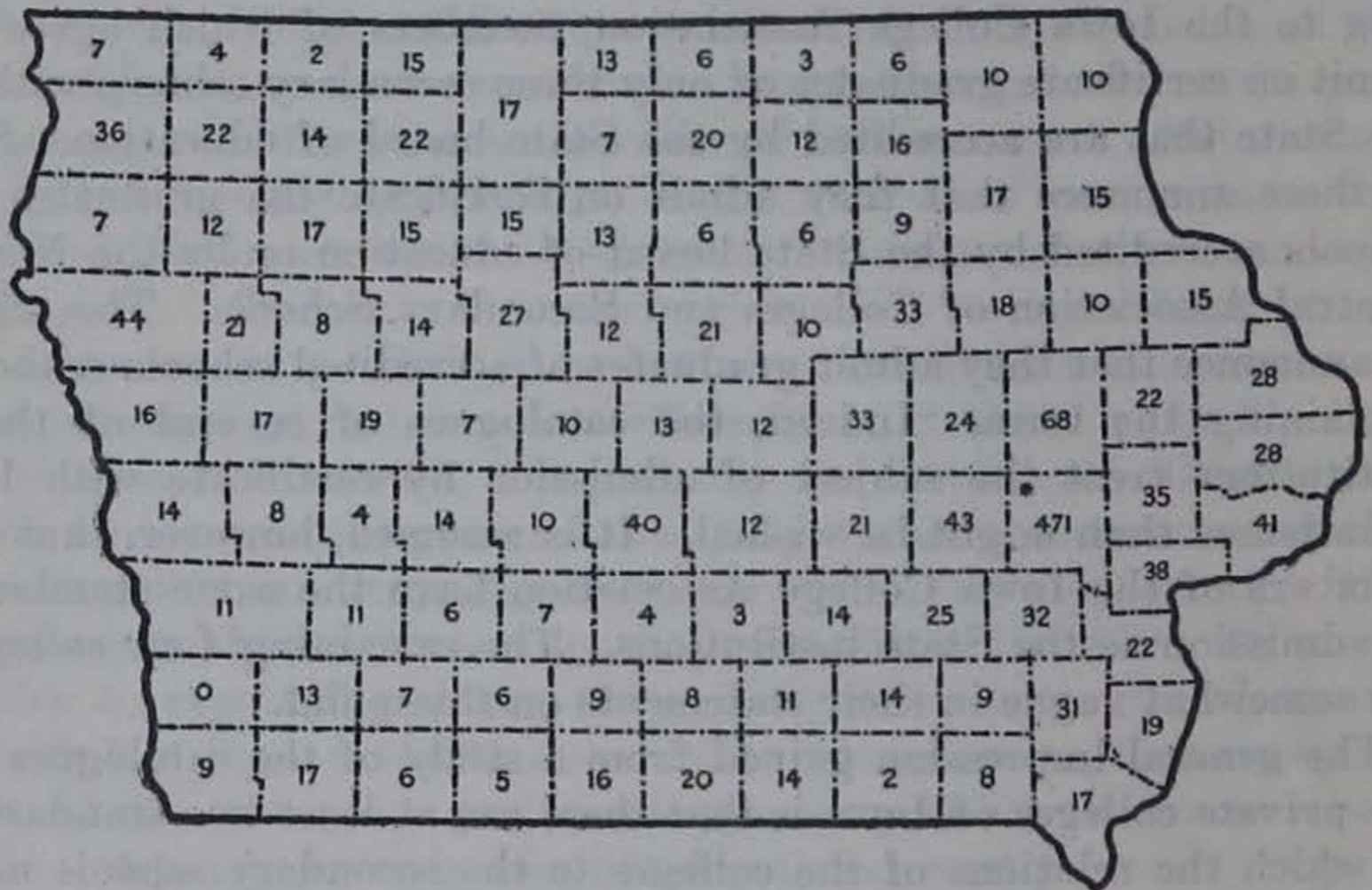
STATE-SUPPORTED INSTITUTIONS.

A few general statements concerning the State-supported institutions, treated as a group by themselves, should be juxtaposed to this discussion of private colleges. The accompanying maps show the distribution of students of the State institutions as to residence among the counties of the State.¹ It is evident that the drawing power of all three State institutions is exerted more evenly over the whole State than is that of any private college. The figures also show that these institutions, as well as the private colleges, attract relatively larger numbers from the territory in their immediate vicinity.

¹ The enrollment maps of the State College of Agriculture and Mechanic Arts and the State Teachers College include also the students in other collegiate courses.

Detailed studies of the amounts of money spent for the State higher institutions appear in later sections of this report. At this point it suffices to note two facts.

The first relates to the sources of income of the State as against the private institutions. For increases in their permanent incomes private colleges are dependent wholly upon the variable generosity of individual benefactors. That any considerable increase will come can not—except under the operation of a kind of law of probability which appears providentially to govern the affairs of colleges—be counted upon with certainty in advance. State institutions, on the other hand, grow rich in material support with the growth in wealth



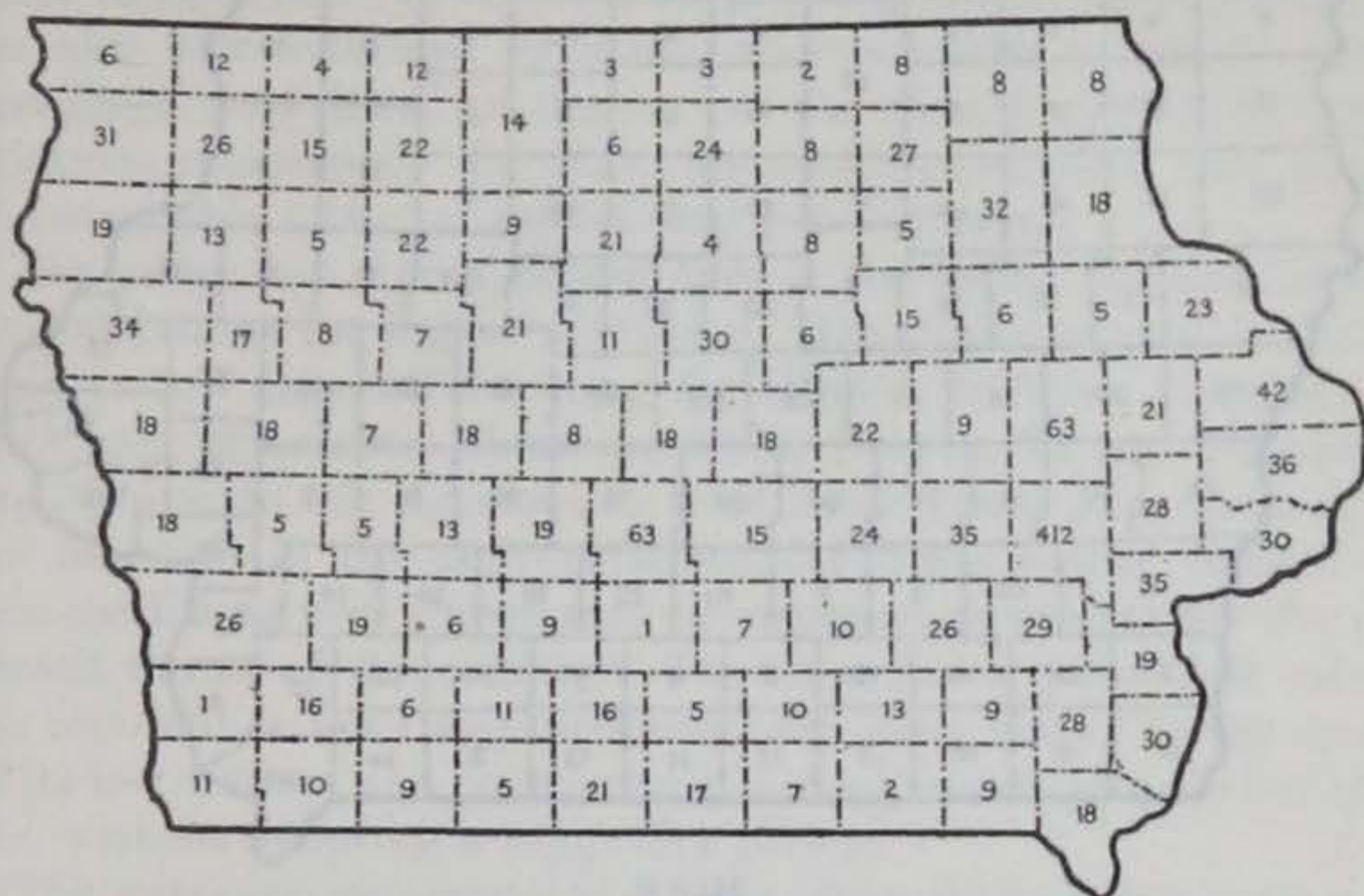
MAP 3.

Iowa State University. Enrollment by counties, 1912-13.

Students from outside of State: Illinois, 32; Kansas, 10; Minnesota, 34; Missouri, 16; Nebraska, 12; North Dakota, 10; South Dakota, 27; other States, 49; foreign countries, 27. Total, 217.

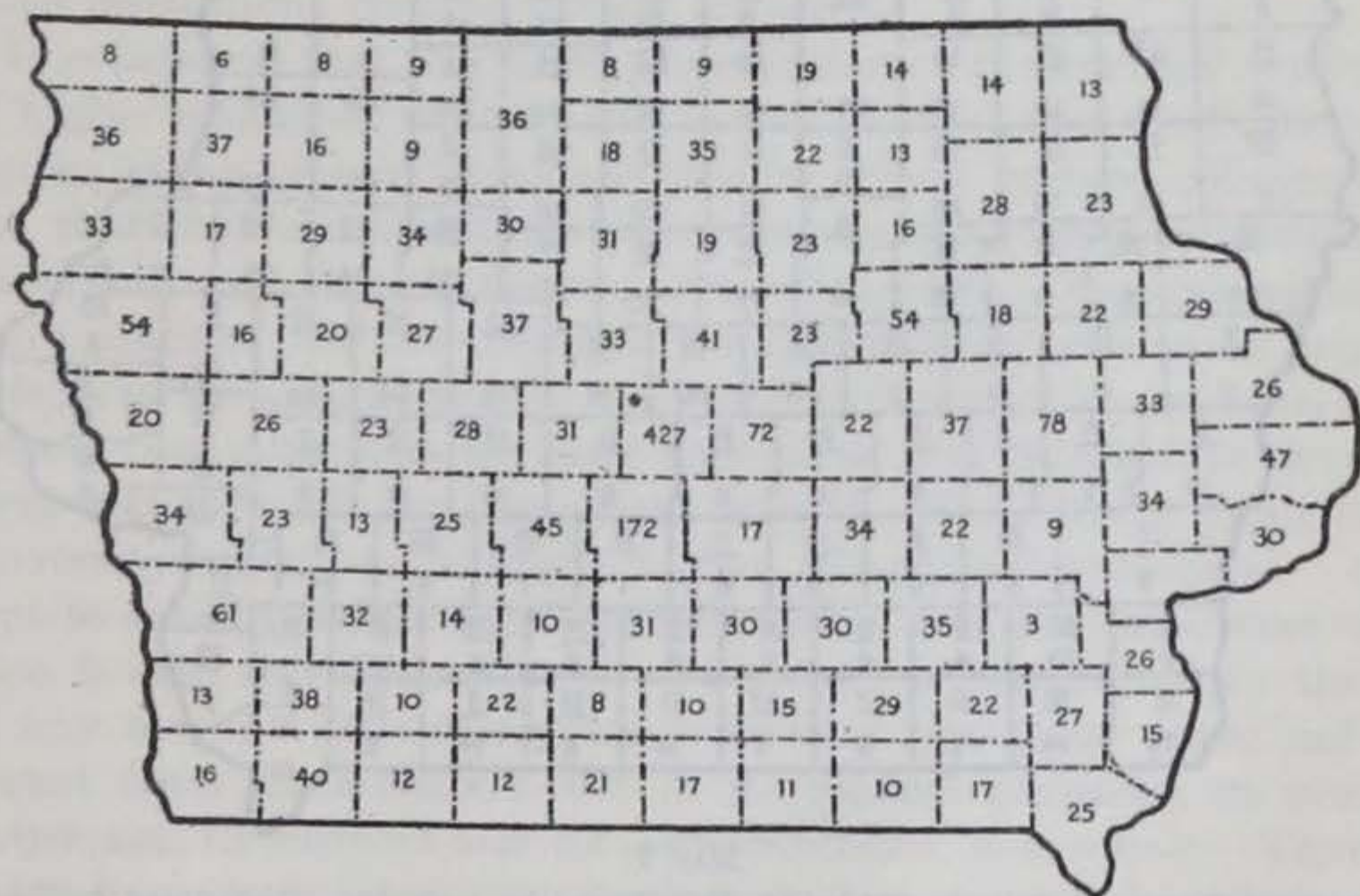
Total students in the university, 2,255.

or population, or both, of the States that maintain them. The appropriations for State higher education are everywhere greater every year. State legislators as a rule are not only willing to pay larger amounts for higher education at each recurring session, but they do not hesitate to appropriate constantly larger percentages of the State's total funds. It is only necessary that the officers in charge of State institutions make a convincing showing that the money is needed and that it is being advantageously spent. As yet the probable limits of State generosity in this direction can not be guessed. For all practical present purposes, therefore, State institutions have an unlimited source of support, even if the source does prove itself at times hard to tap. If this is true in general, it is especially true



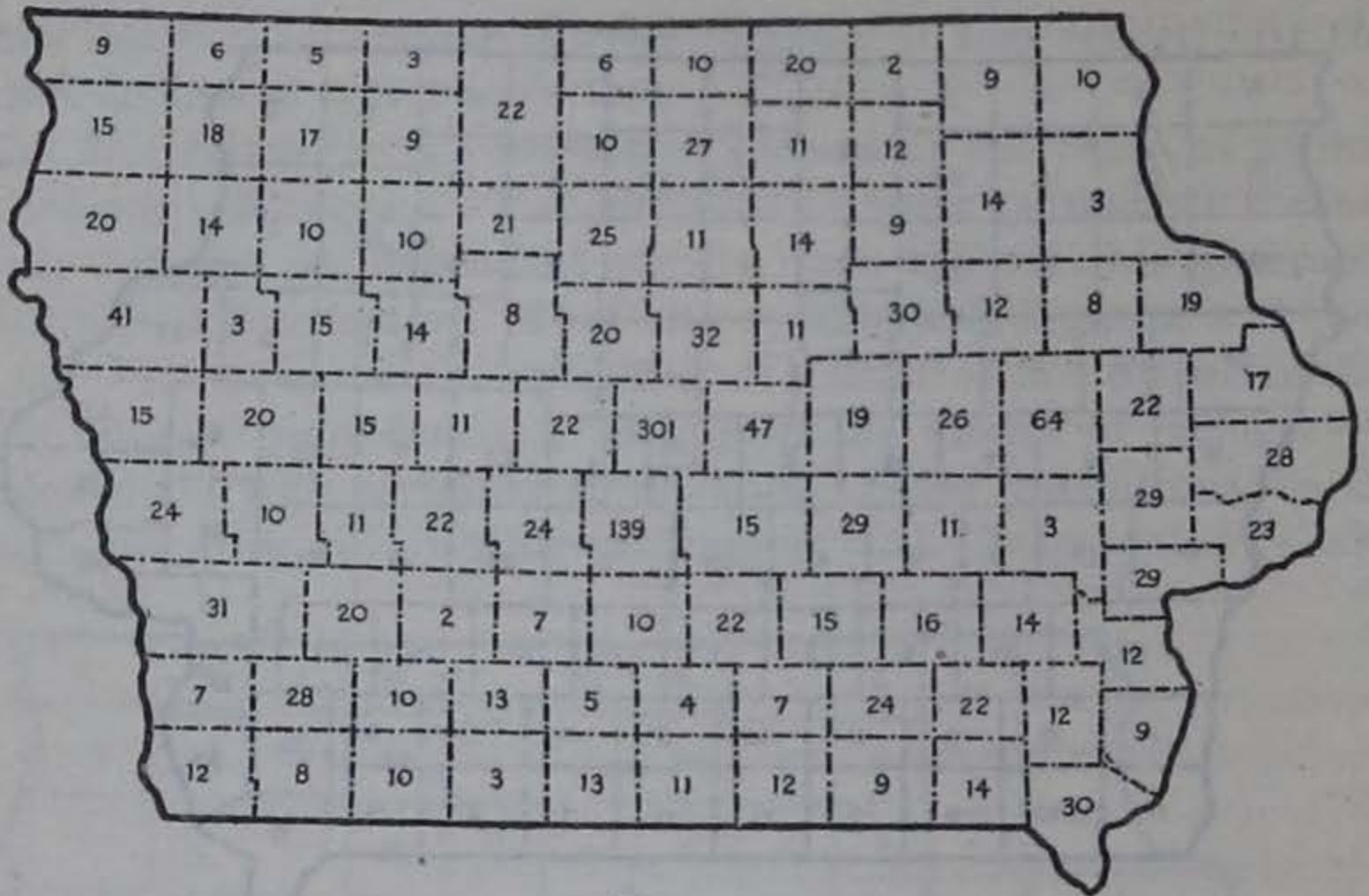
MAP 4.

Iowa State University. Enrollment by counties, 1914-15. (First semester.)



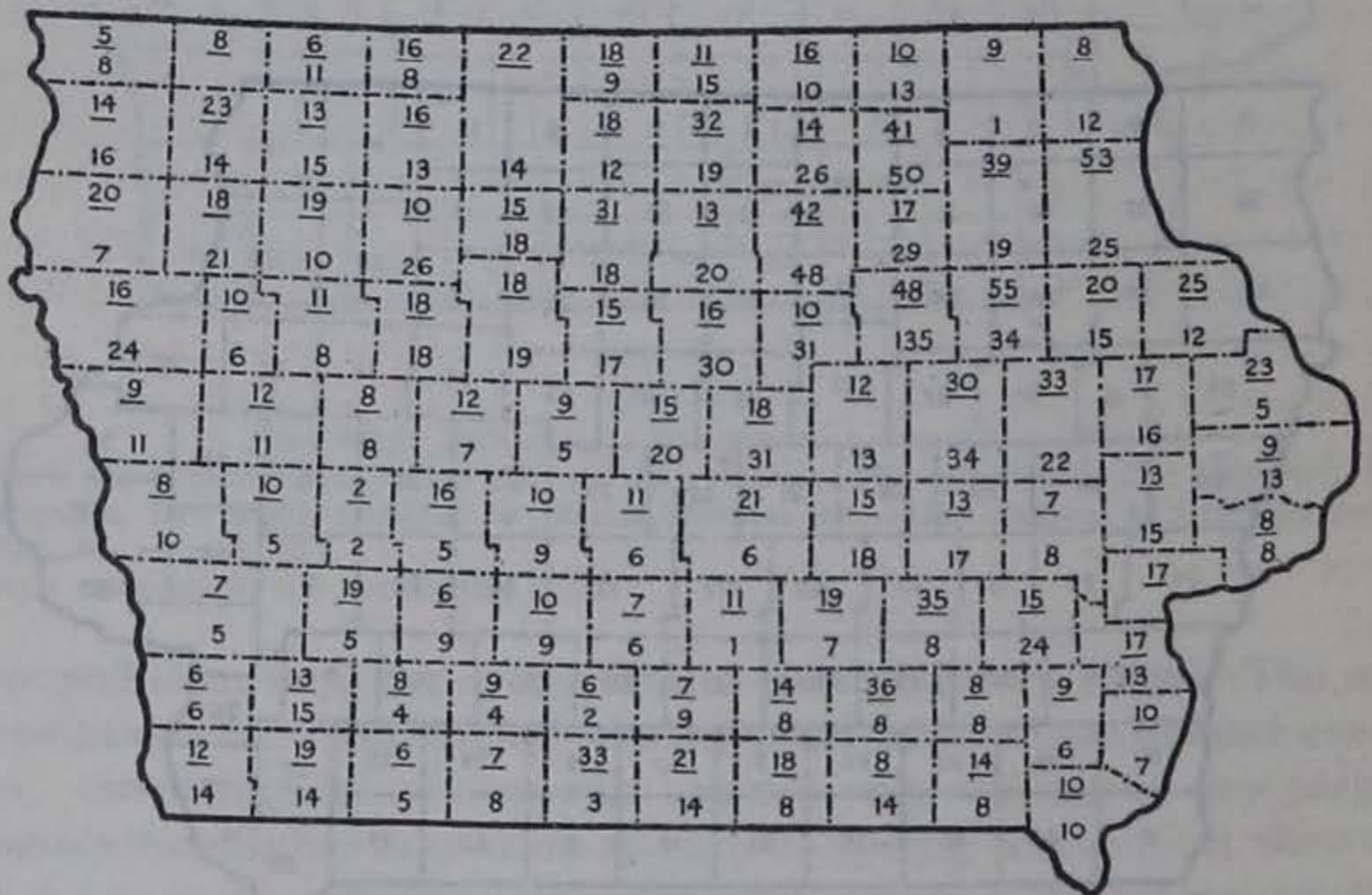
MAP 5.

Iowa State College of Agriculture and Mechanic Arts. Enrollment by counties, 1913-14. From other States: Washington, 2; Oregon, 3; California, 13; South Dakota, 26; Minnesota, 60; Nebraska, 51; Kansas, 9; Wisconsin, 10; Illinois, 79; Missouri, 16; Indiana, 17; Kentucky, 11; Ohio, 14; New York, 10; Pennsylvania, 18; other States, 59; foreign countries, 25. Total, 3,458.



MAP 6.

Iowa State College of Agriculture and Mechanic Arts. Enrollment by counties, 1914-15. Total collegiate enrollment, 2,319.



MAP 7.

Iowa State Teachers' College, 1913-14. Enrollment by counties. Underlined figures are for the summer session, 1914. Total summer enrollment (not including 289 students who re-enrolled for the fall, winter, and spring terms of 1914-15), 1,733. Other figures represent regular enrollments, 1914-15; total, 1,769. Total students in all terms for the year, 3,502. The figures for Blackhawk County do not include Cedar Falls city, with 118 in the regular course and 32 in the summer session, nor the Fourth Ward, with 117 in the regular sessions and 38 in the summer course.

From other States: Regular course, 97; summer, 46; from foreign countries, 4.

of Iowa. The State has shown itself unusually generous toward its State institutions. It is rich and growing richer. The commission has also been informed by many representatives of public opinion that there is no desire on the part of the State to curtail the appropriations required by the State institutions, provided only there is no remediable waste in institutional expenditures.

The other fact worth noting here is the actual increase in State appropriations for higher education. Diagrams printed in the Appendix show curves illustrating for Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Montana, Ohio, Oregon, Texas, Washington, and Wisconsin the increases in total State funds appropriated and the increases in the appropriations for State higher institutions.¹ The conditions here shown may be regarded as typical for the prosperous States of the country. The commission points out later in the report that Iowa may probably save some money in the conduct of its institutions, and consequently make a better comparative showing, without adopting a niggardly policy.

The entrance requirements of the State higher institutions are uniform. (See p. 16.) They compare favorably as to quality and quantity of secondary work demanded with those imposed elsewhere in the country by institutions of the highest standing. Moreover, the investigations of the commission indicate that they are in all three institutions conscientiously enforced.

It is believed that this brief presentation of the current conditions of higher education in Iowa will reveal the fact that the State institutions enjoy certain great advantages which private colleges lack and that they are burdened with corresponding responsibilities for leadership and the establishment of standards. The suggestion is also made and will be amplified later that there are certain organic defects in the administrative machinery whereby they are controlled, defects that must hamper their legitimate and harmonious development and that call for immediate remedy. Iowa has a single State university system or a single higher educational enterprise. (Except to avoid possible legal complications, it is not important what term is used to characterize it. Its nature is not altered by the use of any term.) This enterprise is divided into three parts and operated from three centers, but in its general purposes, its area of patronage, its support and its responsibilities, it is a unit. That the State has appreciated this fundamental unity and has desired to promote it is evidenced by the fact that it has placed all three institutions under the control of a single board. Iowa's greatest educational task is to transform this, as yet, almost wholly external and mechanical unity into a real unity of aim supported by mutual friendly cooperation.

¹ See Appendix, p. 200.

Chapter II.

EXPENDITURES OF IOWA STATE INSTITUTIONS OF HIGHER EDUCATION.

The State board originally sought the assistance of the Commissioner of Education in the preparation of a budget for the next biennium.¹ The commission has interpreted this fact as a mandate to hold the question of costs continually in mind. While, as has already been implied and will be pointed out in detail later, the commission does not regard the fiscal aspects of the problem confronting the board as the most perplexing, nevertheless, the obligation laid upon the board to conduct the institutions under its control with all reasonable economy has been fully appreciated in the inquiry. It is realized that the fiscal test is the ready popular test which will always be applied as an estimate of the success of the board's stewardship. As a means of orientation, therefore, in the study of the three State institutions of higher education, specific discussion begins with an analysis of the expenditures of the institutions for the past two academic years.

The expenditures of different institutions of higher learning differ in many particulars. The forms in which these expenditures are reported differ still more. The commission has made an endeavor to summarize the expenditures of the three State higher institutions of Iowa in a form that would give a somewhat comprehensive and suggestive view of them. As the survey is chiefly concerned with various phases of the educational work of the institutions, the total expenditures for the year are first divided into two main groups: *Educational expenditures* and *extension and service expenditures*. The *educational expenditures* are then divided into three separate categories: *Construction and land*, *special and rotating funds*, and *operating expenditures*.

The category *construction and land* includes expenditures for direct additions to the plant to provide for growth in enrollment, together with outlays for the ordinary furniture of new buildings. *Special and rotating funds* include expenditures from prize funds, boarding and rooming departments, and special funds available only for indicated purposes apart from instruction. These two classes of expenditures are in a certain sense entirely independent of the cost of the operating of the educational plant.

The category *operating expenditures* includes all expenses for the annual maintenance of the institution aside from dormitories and boarding departments. It is further analyzed into *instruction, edu-*

¹ See Introduction, p. 7.

educational equipment and supplies, and *general operating expenses*. The distribution of the expenditures of the institutions may be arranged as follows:

Total expenditures.	Educational.	Construction and land.	Instruction.
		Special and rotating funds.		Educational equipment and supplies.
		Operating expenditures...	General operating expenses.
	Extension and service.		

Of the subdivisions under *operating expenditures*, the first—*instruction*—includes the salaries of the deans, but not those of the president, other purely administrative officers, and librarians. The second, *educational equipment and supplies*, includes, in addition to all funds expended for departmental purposes under faculty control, also the expenditures for books and library supplies. The third, *general operating expenses*, comprises what might be classed as the overhead expenses of the institution, including the salaries of administrative officers, janitors, etc. These expenditures are essential to the main work of instruction, but have no direct relation to it.

From a business point of view, part of the expenditures under the second and third subdivisions of the preceding paragraph might be considered capital account outlays. In a college or university, however, they are rather annual expenses, necessary to keep the institution abreast of the times. They never stop. For example, \$1,000 spent for books can certainly be charged to capital account, as it definitely increases the property of the institution. On the other hand, no matter how much may be spent for books in any one year, more money is required each year thereafter in ever-increasing amounts to meet the new demands of scholarship and the expansion of the field of knowledge. So, in this distribution, all expenses which may be looked forward to by the administration as necessary annual expenses are classed under *operating expenditures*.

In determining the average cost per student, the average number of students in attendance during the college year September to June is taken. It is to be noted that there is a distinction between the enrollment as ordinarily stated in a catalogue and the figures here used. The usual catalogue statement of enrollment includes all students who have attended the institution during any part of the year of 12 months. Often the summer enrollment is large. Generally the number of students in actual attendance rises from the opening of college in September for about two weeks to a maximum, and then declines because of withdrawals until the close of the term. The second term or semester usually opens with increased numbers, again reaching a maximum shortly after the opening day, and then gradually declining until the close of the year. The commission is of the opinion that an average of the largest

attendance in the two semesters gives the best average attendance available. This point may be illustrated with figures for the State college, 1914-15:

Catalogue enrollment	3, 629
Attendance Oct. 1, 1914.....	2, 522
Attendance Feb. 15, 1915.....	2, 467
Average attendance	2, 495

Attention is called to the following table, showing the per capita cost of the three institutions for 1913-14 and 1914-15:

TABLE 3.—Per capita cost of three institutions in 1913-14 and 1914-15.

Items of expenditure.	State university.	State college.	Teachers college.
<i>In 1913-14.</i>			
Instruction.....	\$155.00	\$134.00	\$93.50
Educational equipment and supplies.....	41.50	63.50	17.00
General operating expenses.....	78.50	72.50	57.50
Total.....	275.00	270.00	168.00
<i>In 1914-15.</i>			
Instruction.....	160.00	141.00	97.50
Educational equipment and supplies.....	42.50	69.00	14.00
General operating expenses.....	72.00	61.00	58.50
Total.....	274.50	271.00	170.00

The items used in these computations comprise the total cash outlay per student under the general head of *operating expenditures*, except that the cost of instruction for the summer session has been omitted.¹ In other words, for the purposes of this table the *operating expenditures* taken are made up of the sum of the total *educational supplies and equipment*, the total *general operating expenses*, and the *cost of instruction* minus the expenditures for the summer term. Moreover, no interest on investment is included. The *average attendance*, determined in the way described above and not the enrollment, has been taken as the divisor to obtain the per capita cost. The method is further exhibited in the summary tables on pages 42 to 47:²

The commission points out that each student costs the institution from \$170 to \$275 a year. A small part of this expense is met by the tuition and fees paid by the student, but it is not far from the truth to say that each student in actual attendance for the college year costs \$250. With approximately 7,000 students enrolled in 1915-16, this amounts to about \$1,750,000 in operating expenses for the college year.

¹ It should be noted that, while the figures appearing in the three columns are comparable with each other, they are not necessarily comparable with figures for per capita cost reported by any other institution.

² For detail tables from which these summaries have been compiled see Appendix, pp. 184-193.

While this is a large expenditure, it is a most wise one, if the students served are earnest and capable and improve to the utmost the advantages afforded them. Indeed, every student enrolled accepts a trust and is under obligations to justify the outlay of public funds made in his behalf. But the officials in charge of the institutions can not fail to bear in mind the fact that each student carries a very definite cost to the State, not only for operating expenses, but also, as will be shown later, for buildings. The annual rate of increase of student registration is already large and will under natural conditions grow larger, as it should. Until the State is ready to care properly for the students now in attendance upon its higher institutions the wisdom of certain forms of competitive advertising at present in vogue is perhaps problematic. The time when the State college and the State university were unknown to the people is past. They need only to make formal announcement of their offerings and give reasonable publicity to their work to secure as rapid increases in their respective enrollments as can be adequately cared for. Possibly the board should also consider in this connection the advisability of discontinuing subcollegiate work as the number of collegiate students increases; but this question is discussed more fully in another place. (See p. 88.)

In conclusion it may be stated that the present cost per student is low rather than high. It should be increased rather than decreased. In fact, a growth in numbers without a corresponding growth in support will result in weakening the institutions.

Summary Table of Expenditures, University of Iowa, 1913-14.

The University of Iowa. Total expenditures 1913-14.	Educational.	Construction.....	\$212,766.33	Educational equip- ment and supplies..	\$95,406.15	Instruction, college year.....	\$354,764.73
		Special funds.....	82,275.94		Instruction.....		364,413.08	Instruction, summer term.....	9,648.35
	\$933,759.86.		Operating expenses.	638,717.59		General operating ex- penses.....	178,898.36
	Extension and service.		Epidemiologist.....	3,276.98			
\$10,298.89		University extension..	7,021.91				
\$944,058.75.							

Per capita cost of 2,290 students, September-June, 1913-14. Oper- ating expenses exclusive of sum- mer term, \$275.		Total.
	Instruction.....	\$354,764.73
	Educational equip- ment and supplies..	95,406.15
	General operating ex- penses.....	178,898.36
		<u>629,069.24</u>

	Per capita.	
	\$155.00	\$155.00
	41.50	120.00
	78.50	
	<u>275.00</u>	

Enrollment:	
First semester.....	2,345
Second semester.....	2,235
Total.....	<u>4,580</u>
Average.....	2,290

Summary Table of Expenditures, University of Iowa, 1914-15.

The University of Iowa. Total expenditures 1914-15.	Educational.	Construction.....	\$238,132.28	Educational equip- ment and supplies. \$100,532.91	Instruction, college year..... \$377,815.50
	\$994,471.19.	Special funds.....	97,725.57			Instruction.....	388,233.74
\$1,017,806.72.	Extension and service.	Operating expenses.	658,613.34	General operating expenses.....	169,846.69
		\$23,334.53.	Epidemiologist.....	5,904.03	Instruction, summer term.....	10,418.24
		University extension.	17,430.50		

Per capita cost of 2,360 students, September-June, 1914-15. Oper- ating expenses exclusive of sum- mer term, \$274.50.		Total.		Per capita.		Enrollment: First semester..... 2,416 Second semester..... 2,303 Total..... 4,719 Average..... 2,360
	Instruction.....	\$377,815.50	\$160.00	\$160.00		
	Educational equip- ment and supplies...	100,532.91	42.50	114.50		
	General operating ex- penses.....	169,846.69	72.00			
		648,195.10	274.50			

EXPENDITURES OF HIGHER STATE INSTITUTIONS.

Summary Table of Expenditures, Iowa State College of Agriculture and Mechanic Arts, 1913-14.

Iowa State College of Agriculture and Mechanic Arts. Total expenditures, 1913-14.	Educational.	Construction.....	\$317,978.63	Educational equipment and supplies. \$144,974.02	Instruction, college year.....	\$305,804.07	
	\$1,037,833.47.	Special funds.....	95,846.55				
\$1,461,684.25.	Extension and industrial service.	Operating expenses.	624,008.29	Instruction.....	313,158.01	Instruction, summer term.....	7,352.04
		Construction.....	42,874.10	General operating expenses.....	165,876.26		
	\$424,850.78.	Special funds.....	142,444.59	Experimental work	145,544.09		
		Operating expenses.	239,532.09	Extension work....	93,988.00		
Per capita cost for 2,279 students, September-June, 1913-14. Operating expenses, exclusive of summer term, \$270.	Total.	Instruction.....	\$305,804.07	Per capita.	\$134.00	Enrollment: First semester..... 2,292 Second semester..... 2,267 Total..... 4,559 Average..... 2,279	
	Educational equipment and supplies..	144,974.02	63.50	136.00			
	General operating expenses.....	165,876.26	72.50				
		616,654.35	270.00				

Summary Table of Expenditures, Iowa State College of Agriculture and the Mechanic Arts, 1914-15.

Iowa State College of Agriculture and Mechanic Arts. Total expenditures, 1914-15.	\$1,150,081.67.	Educational.	Construction.....	\$338,336.52	Educational equipment and supplies. \$172,218.11	Instruction, college year..... \$352,293.82	
			Special funds.....	124,600.42			
			Operating expenses. 687,144.73		Instruction.....	362,291.87	
					General operating expenses.....	152,634.75	
		Extension and industrial service.	Construction and land.....	14,778.21		Instruction, summer term.....	9,998.05
			Special funds.....	140,341.71			
		\$449,348.79.	Operating expenses. 294,228.82		Experimental work..	163,883.32	
					Extension work.....	130,345.50	

Per capita cost for 2,495 students, September-June, 1914-15. Operating expenses, exclusive of summer term, \$271.	Total.
	Instruction..... \$352,293.82
	Educational equipment and supplies.. 172,218.11
	General operating expenses..... 152,634.75
	677,146.68

Per capita.	
\$141.00	\$141.00
69.00	130.00
61.00	
271.00	

Enrollment:	
First semester.....	2,522
Second semester.....	2,467
Total.....	4,989
Average.....	2,495

Summary Table of Expenditures, Iowa State Teachers College, 1913-14.

Iowa State Teachers College. Total expenditures, 1913-14.	\$298,808.65	Construction.....	\$58,885.81			
		Educational.				
		\$298,488.65	Special funds.....	1,649.33	Educational equip- ment and supplies.	\$22,707.06
			Operating ex- penses.	237,953.51	Instruction.....	139,984.63
				General operating expenses.	75,261.82	
		Extension study center				
	\$320.00					

Per capita cost for 1,309 students, September-June, 1913-14. Oper- ating expenses, exclusive of summer term, \$168.		Total.	Per capita.
	Instruction.....	\$122,049.64	\$93.50
	Educational equip- ment and supplies.	22,707.06	17.00
	General operating ex- penses.	75,261.82	57.50
		220,018.52	168.00

Enrollment:	
First term.....	1,297
Second term.....	1,384
Third term.....	1,245
Total.....	3,926
Average.....	1,309

Instruction college \$122,049.64
year.
Instruction summer 17,934.99
term.

Summary Table of Expenditures, Iowa State Teachers College, 1914-15.

Iowa State Teachers College. Total expenditures, 1914-15.	\$357,598.33.	Educational. \$349,495.82.	Construction.....	\$86,013.52	Educational equip- ment and supplies.	\$19,745.08	Instruction, college year.	\$137,886.75
			Special funds.....	1,779.93				
			Operating ex- penses.	261,702.37	Instruction.....	158,581.60	Instruction summer term.	20,094.85
		Extension study center			General operating expenses.	83,375.69		
		\$8,102.51.						

	Total.	Per capita.
Per capita cost for 1,419 students, September-June, 1914-15.		
Operating expenses, exclusive of summer term,		
\$170.		
Instruction.....	\$137,886.75	\$97.50
Educational equip- ment and supplies.	19,745.08	14.00
General operating ex- penses.	83,375.69	58.50
	<u>241,007.52</u>	<u>170.00</u>

Enrollment:

First term.....	1,406
Second term.....	1,485
Third term.....	1,366
Total.....	<u>4,257</u>
Average.....	1,419

Chapter III.

DUPLICATION AND THE PRINCIPLE OF MAJOR LINES.

It has been stated that the commission, early in the course of its investigations, became convinced that, if it were to do justice to the problems presented to its consideration, it must take account of certain larger issues which have had a determining influence in shaping the development of educational administration in Iowa and which have in a great measure given rise to the questions on which the State board now seeks advice. The commission is persuaded that no permanent solution of the educational difficulties which the State has experienced can be hoped for until these issues have been resolutely faced and definitely settled on the basis of the highest good of the State and its coming generations of students, whatever the cost to personal or institutional ambitions. It confidently believes that a settlement on this basis is possible and that the necessary procedure is plain. It is far more important that such a settlement should be brought about than that the State should save a few thousands of dollars through economies in institutional management. Without recapitulating the history of State higher education in Iowa, the commission proposes in the present chapter to discuss the existing status of the three State higher educational institutions, especially as regards the fundamental question of duplication, and to point out a remedy which it conceives to be valid for the incoherency in the relationships between them.

The primary difficulty, so far as the three higher institutions are concerned, lies in the lack of clear definitions of scope, particularly as between two of them. In the beginning of State plans of education a State university was projected as the crown and completion of the system. At that time the differentiation of education into great spheres or divisions of subject matter was not foreseen in any of the States, and it was natural and perhaps inevitable that inharmony should arise with the founding of other institutions to care for the constantly enlarging demands. While theoretically and historically a State university may represent the culmination of the State system, practically the fields of all State institutions are determined by the successive acts of the legislatures.

There is marked tendency in all States to bring about a parity between the institutions of higher education, expressed in like or equivalent entrance requirements, in comparable educational standards and in equality of standing on the part of the staffs. In some States the effort in higher education is concentrated in one institution, known as the State university, in which all subjects are at once on a parity. In those cases in which the effort is distributed in

separate institutions the different subjects may, nevertheless, be on a parity, and the institutions may be conceived as one university separated into its parts, or the different parts may be recognized in fact, if not in name, as separate universities, each covering the field assigned to it. To one part in the State organism of higher education may be assigned all the liberal arts, the so-called learned professions and their adjuncts; to another may be assigned the applied sciences, mechanic arts and engineering, agriculture; to another the training of teachers. It remains for the State to define the fields of each in consonance, so far as necessary, with Federal statutes, and no one of the parts or institutions may assume the entire field to itself. This much must be granted before there can be a real harmony in any State.

Nor can the intention in the different parts or institutions be longer held to give one part superior standing or merit or to separate it into an educational class by itself. Education in terms of the applied subjects is as truly education as that in terms of other subjects, no less and no more if the teachers are as well trained, the institutions as well equipped, and the work as well done. The distinction in educational results between these complementary lines of effort is now happily vanished. Accepting this parity places a State in readiness for a harmonious development of its institutions.

The particular factor that has introduced the inharmony into many of the States is the rise of the land-grant college. In about half the States this institution is a part of the State university. In these cases the difficulties are now reduced to a minimum, while in some States they have been practically eliminated. In the States in which the land-grant college is separate the conflicts and duplications are naturally most marked. At one time it was thought to be the wisest policy to separate the institutions, because their fields of work were supposed to be incompatible, but at present, when all institutions of higher education are so rapidly expanding, there is widespread feeling that the land-grant college is best united with the university or incorporated into it. When a harmonious State procedure has been devised, however, there may still be certain very marked advantages in the separation. At all events, it is the responsibility of the State in such cases to make a coherent plan and to prevent conflict. This is now the major problem in educational administration in the United States, but it ought not to be difficult of solution if the adherents of the different institutions once accept the principles just stated. The conflicts between the different kinds of institutions result in large part from an attitude of mind.

Mere duplication of courses of study may not be any more disadvantageous or more to be deplored between two institutions than between the parts of one institution which is the size of the two. As

will be pointed out presently, the cost to the people may not be increased. Two or more State institutions of the same grade, but with different fields, may, indeed, produce a most wholesome stimulation, if they do not inharmoniously overlap, giving to the State a spirited and progressive development, preventing ingrowing, and separating its student body into groups small enough for the best educational results. The different faculties, working under separate administrations and developing in somewhat unlike directions, may add very much to the achievement of the State.

In dealing with the problems of duplication as manifested in the practice of the Iowa State institutions the commission has been guided by what may be described as the principle of "major and service lines" of work. In accordance with this principle, which is implicit in the considerations adduced above, each State institution should have assigned to it certain major fields which it may be expected to develop to their fullest extent. Agriculture at the State college of agriculture and mechanic arts is such a major line. Latin, German, French, history, political science, psychology at the Iowa State University are such major lines. Service lines are such subordinate subjects as are essential to the proper cultivation of a major line. The amount required is generally not very large. English is such a service line for engineering and agriculture at the State college. Institutions may well overlap as regards the relation of their service lines to one another and more particularly as regards the relation of their major to their service lines. English is a major line at the State university, a service line at the State college. But there should be no material overlapping of major lines.

In many parts of the educational field such a division affords a rational and practicable principle of administration. Between the State university and the State college this division would at present reserve as major lines to the institution at Ames agriculture, veterinary medicine, home economics, and certain departments of engineering to be later determined. It would make all other subjects at Ames service subjects, in no case to be developed beyond the point at which the needs of the major subjects are supplied. In the actual working of this principle it would result that a moderate amount of elementary collegiate work might be given at the State college in the languages and humanities and certain of the sciences, but that they would presumably never go beyond these rudimentary stages. At the State university agriculture and certain fields of engineering, if cultivated at all, would in the same way have a place only as service subjects contributory to the major lines allotted to the institution.

Certain subjects do not fall readily into line on such a principle of division. Chemistry, for example, has an obvious place at the State

niversity and also at the State college. Even aside from "chemical engineering" as such, chemistry is involved in many engineering processes and problems to a degree absolutely demanding its presence at the State college and making it practically difficult to determine to what extent it is merely a service subject and to what a major line. This embarrassment regarding chemistry is even greater when certain agricultural problems and the work of the experiment stations are taken into account.¹ Physics, zoology, bacteriology, and botany also present similar perplexities.

It seems to the commission that the detailed adjustments of these cases of overlapping, once the main principle has been accepted, are all obviously capable of amicable settlement by means of a conference consisting of some convenient number of representatives of the faculties of the institutions affected (perhaps five from each), elected by the faculties, and sitting with a committee of members of the State board of education. Such a conference might meet at stated periods, perhaps annually, to consider and adjust any difficulties that may arise from time to time. Meantime the principle of the major and the service lines will automatically settle the status of by far the larger number of subjects and forthwith determine whether in a particular institution they shall be developed beyond their elementary stages.

It may be properly remarked at this point that the oft-raised objection to the alleged exorbitant cost of duplication when the same subject is taught at two State institutions is largely specious. It costs no more to teach two sections of English at Ames and two at Iowa City than it does to teach four sections at Iowa City, assuming that the instructors are paid at the same rate in both places and that the size of the classes is kept constant at the point of maximum instructional efficiency. The overhead charge may be somewhat larger when the work is done at two places, but this is not necessarily the case. In any event the main objection to duplication of work in State institutions like those of Iowa is not expense, but the stimulation of unwholesome competition with all its evil consequences.²

Once this principle of major and service lines is adopted, the whole situation clears up not only as regards intramural work, but also as regards extension work. An institution would be permitted to do extension work only in a major line. This itself would avoid the duplication and overlapping now threatened, and if the safeguard elsewhere recommended (see p. 77) of an annual conference of the

¹ For a further discussion of chemistry, see p. 69.

² The relations of the State teachers college to the State university and to the State college have elicited much less public comment than the relations of the latter two institutions to one another, in spite of the fact that at present the liberal arts work at Cedar Falls and at Iowa City squarely and unequivocally overlaps.

extension officials of the several institutions is provided, there need never arise any serious problem of maladjustment.

The commission is of the opinion that in a Commonwealth with the geographical, economic, and social characteristics of Iowa there might well be justification for several State institutions of collegiate grade in different parts of the State; that so far as concerns strictly collegiate work, there is no very grave objection to be urged against the present practice of offering such work in three different places, although the justification would be greater if the three were in more widely separated localities, and, as indicated elsewhere (see p. 54) the wisdom of continuing the final two years of work at the State teachers college is questioned. But the commission is unable to see that there can in the last analysis be any justification for sweeping duplication in the range of advanced and professional work. It would certainly strike every unbiased observer as absurd to urge that there should be two medical schools conducted by the State at different points. It would seem equally absurd to conduct two law schools. Neither the size of the State nor the educational needs of that portion of the country in which the State of Iowa is located can possibly be held to justify such duplication. Abundant expert opinion upon this matter is available in the actions of the controlling authorities in charge of medical and legal education in this country. Considered strictly on its merits, there seems to be no more *prima facie* justification for two engineering schools. Indeed there are certain branches of engineering work which ought not to be undertaken at all in Iowa. Marine engineering, for example, surely has no place in an inland agricultural community. The theory that a State is under obligation to give instruction in every field of learning is regarded as fallacious, and each new undertaking of an educational kind ought to be subjected to the critical scrutiny of disinterested experts.

The commission is of the opinion that the continuance of the two schools of engineering as at present organized is uneconomical and indefensible, especially in so far as it concerns the development of upper-class and graduate work. At least three methods of readjustment are possible. (1) The horizontal, by which one school would become a strictly graduate institution and the other school an undergraduate institution. This would accord well with the mature judgment of a large section of the engineering profession that a bachelor's degree or two or three years of the work in liberal arts and science leading to such a degree, is the best possible foundation for the technical training of an engineer. In the judgment of the commission, this method is not at present applicable to the Iowa situation. Unless the principle were applied drastically, so as to require

a bachelor's degree for entrance to the more advanced of the schools, the difficulties of the present academic situation would not be materially lessened, and the possible overlapping in the field of extension work would require altogether separate consideration and treatment.

(2) The union of the two schools in one place under highly expert direction. The commission is unanimously convinced that this is the method by which engineering work under State support in Iowa could best be maintained and developed. No other method will so certainly insure the permanent elimination of the causes of friction, irritation, unwholesome competition, and wasteful duplication of high-class men and equipment for advanced work. It is scarcely conceivable that the State, if it did not now have two schools of engineering, would consider the establishment of more than one. The commission is not unmindful of the weight of arguments which may be adduced in support of the unification of this work at the State university, where it would enjoy the stimulation of other high-grade professional schools, where it would have a strong backing in the pure sciences and helpful contact with the liberal arts, and where it could be maintained on a high level, free from the tug of artisanship. On the other hand, the commission does not forget the fact that the land-grant colleges are quite as much bound by their essential character to develop mechanic arts (usually interpreted as synonymous with engineering) on an equal footing with agriculture. In view of this necessity for the joint development of agriculture and engineering, the commission believes that such union of schools, if it could be accomplished, should be made at the Iowa State College.

(3) If this second method is adjudged impracticable of application, considering the present condition of institutional and popular sentiment in Iowa, the commission recommends that a definite vertical (or topical) division of engineering should be carefully worked out by the board of education in conference with a small group of expert engineers, wholly unconnected with either institution, each of whom should be a member of one or another of the four American societies of civil, electrical, mechanical, and mining engineering. All four societies should be represented. When once this division has been determined, it should be rigidly enforced by all the educational authorities concerned. Perhaps this could be accomplished under a single dean of engineering for the two institutions, supplemented by unremitting detailed examination on the part of the board of announcements of engineering curricula and courses. In such a division it appears likely that the work in municipal and sanitary engineering, hydraulic engineering, and perhaps structural engineering, should be conducted at the State university, and that the work in highway, transportation, electrical, and mechanical engi-

neering should be developed at the State college. The necessity for work in mining, ceramic, or chemical engineering, and the location of this work, are matters for future consideration, in view of recommendations made elsewhere in this report and the possible future report of such a commission of impartial engineering experts as is suggested and urged.

Whether the work in domestic science can be regarded as up to the present time sufficiently differentiated on professional lines to warrant recognition as presenting a problem similar to that of medicine, law, and engineering may perhaps be questioned. Certainly the work as at present conducted relates itself as a service subject to a much wider range of nonprofessional interests and is as yet in too formative and unstable a condition to justify dogmatic assertion. The commission discusses this subject at length, however, and makes certain recommendations in Chapter VIII.

The position of music may serve to raise a similar question. Its development as a major line should unquestionably occur at the State university. It may well remain as a service line at the other State institutions.

With regard to the proposed discontinuance (beyond the second year of the professional work) of the work in liberal arts at teachers college, Cedar Falls, the commission is disposed to urge the wisdom of this on several grounds. In the first place, it seems reasonably clear that the institutions at Ames and Iowa City are at present abundantly able to care for all students who may be expected to seek the bachelor's degree in a State institution in Iowa. If the State wishes a third institution of a collegiate grade, it ought to be in the southern or western part of the State. Moreover, as has been clearly shown in another section of this report (Chap. I), the private institutions in the State are able to care for a very large proportion of the students who wish this degree, and between them and the other two State institutions all such students can be readily cared for. In the second place, the commission feels certain that at present, at least, the atmosphere of the institution is not unequivocally collegiate, and that students who now receive training there for the bachelor's degree are likely to miss certain valuable elements in such training. This opinion is based partly on the impression which one who has visited many institutions easily gets from even a brief contact with the situation, partly on consideration of the methods of class instruction, which are on the whole dominantly those of the high-school and junior-college type, and partly on the fact that the presence of a very large group of subcollegiate students inevitably affects the general intellectual maturity and academic tone of the work. In the third place, the amount of work now offered as of third and fourth year college grade is relatively small and may be regarded as only barely

sufficient to round out a senior-college curriculum. A comparison of the program of courses at the State teachers college with that at the State university or at the State college of agriculture and mechanic arts will confirm this statement. To be sure, a comparison of some of the weaker sectarian colleges would not be unfavorable to the teachers college, but this is a comparison which a State institution would hardly wish to employ.

Under these circumstances the commission feels that the expenditure of money and energy represented in keeping up the last two years of collegiate work at Cedar Falls is probably not to be justified on its merits. The commission would not be understood in this opinion as intending to depreciate in any way the seriousness of the work offered, nor the devotion and earnestness of the staff of instruction. The professional work done here is creditable to the State and to the authorities of the school, but a division of energy such as is suggested would in the long run contribute to the efficiency of the State institutions as a whole. Such a program, if carried out, would not in our minds imply the reduction of the budget of this institution. Quite the contrary. It would mean concentrating all resources on the earlier portions of its work, where at present its greatest obligation is found, and where there are certainly at present massed the great majority of its students, as Tables 4 and 5 on page 56 will indicate.

More particularly the commission would call attention to the desirability of greatly enlarging the facilities for practice teaching at teachers college. The present practice school in immediate connection with the institution is already overtaxed, and the commission finds it difficult to believe that the facilities offered in the town of Cedar Falls are at present wholly adequate. The commission is quite clear that the general attendance at Cedar Falls ought not to be permitted to expand until thoroughly satisfactory provision is made for practice teaching.

If the board and the people of the State are disposed, on further consideration of the question, to agree with the commission that the appropriate function of the State teachers college is the preparation of teachers for rural and graded schools, and not the preparation of high-school teachers, or the granting of the bachelor's degree for courses in liberal arts, the commission is strongly of the opinion that the future development of the institution on somewhat different lines is desirable. It recommends, therefore, that the courses for elementary teachers, both rural and urban, be made three years in length, substantially one-third of the time to be devoted to professional subjects, and the rest to work dealing with the subject matter of instruction. Entrance to those courses should, as soon as possible, be based squarely on high-school graduation. Such courses should

not, in the judgment of the commission, lead to degrees. It is persuaded that the improvement in the equipment of elementary, especially rural teachers, which this recommendation contemplates, would not only contribute vitally to the welfare of the State, but would place the State teachers college in a unique position of leadership among teacher-training institutions in the United States.

If the board does not see fit to adopt these suggestions, however, and if the plans at present in operation be continued, then the commission would advise that the last two years of the work be very greatly strengthened to bring it more nearly into line with the curricula of first-class institutions conferring the bachelor's degree.

TABLE 4.—Attendance at Iowa State Teachers College, Cedar Falls.

Courses.	1912-13	1913-14	1914-15	Total.
College courses ¹	649	420	560	1,629
Diploma courses.....	503	831	843	2,177
Subcollegiate.....	826	820	865	2,511
Unclassified and music.....	714	907	1,234	2,855
Total.....	2,692	2,978	3,502	9,172
Total diploma, subcollegiate, unclassified, and music students.....	2,043	2,558	2,942	7,543

¹ These figures include students entered as graduates as follows: 1912-13, 53; 1913-14, 45; 1914-15, 45. Juniors and seniors are listed in this group as follows: 1912-13, 170; 1913-14, 153; 1914-15, 193.

TABLE 5.—Statistics of Iowa State Teachers College for five years, 1907-1912.

Total number of individual students enrolled during the five years, each student counted only once.....	8,398
Students were qualified and trained for the following:	
(1) County school teachers, reaching the standard of county teachers' certificates.....	3,261
(2) General elementary teachers, having first-grade county certificate scholarship on admission.....	1,328
(3) Special grade and department teachers of all kinds—primary, kindergarten, music, drawing, home economics, etc.....	2,515
(4) Special music teachers.....	138
(5) Unclassified as to kind of work preferred.....	156
(6) High-school teachers—	
(a) With standard of North Central Association four-year college course.....	285
(b) First-grade State certificate standard.....	300
(c) Second-grade State certificate standard.....	300
(d) Other special teachers, estimated.....	115
	—— 1,000
Total.....	8,398

Whether the suggestion made above be adopted or not, the commission is perfectly clear that there are to-day no agencies in Iowa adequate to furnish proper training to the number of teachers annually required in the schools of the State. This fact has evidently

been recognized in the legislation providing for the addition of a year of normal training in certain high schools. The commission is fully cognizant of this situation, and its suggestion regarding teachers college is therefore in no sense directed to any lessening of the resources of the State in this direction. There should be additional normal schools established, in parts of the State remote from Cedar Falls and probably preferably in the southwest and northwest divisions of the State. If such normal schools were brought into intimate contact with the normal training high schools, and with the movement for the development of junior colleges in connection with the strong high schools which has gained great headway in many parts of the country, these several institutions could be made to reenforce one another in a most helpful way. An appreciable amount of serious collegiate work could be offered as a basis for professional training in these junior colleges on high-school foundations; and the normal schools, if brought into administrative contact with them, could furnish not only a spirit of professional standards and a corresponding stimulation, but could also be used to develop practice teaching work in various portions of the State now wholly unprovided with such facilities. A similar relationship could be cultivated between the normal schools and the normal training high schools.

In this connection attention should be called to the possibility of adding a group of strong men to the faculty of the teachers college (and to other normal schools, if established), who might give one-half of their time to instruction and the other half to service as members of the staff of the State superintendent of public instruction, supervising the work of the normal training high schools. Such an arrangement would greatly enhance the solidity and efficiency of the normal training courses and would bring both the State superintendent's office and the normal schools into most helpful organic connection with these high schools. Any measure that will improve the supervision of the training of rural teachers and that will put at their disposal added opportunities for practice teaching ought to be energetically fostered.

The foregoing discussion and the recommendations of the commission in this and subsequent chapters are based on the assumption that all three institutions are to be continued without essential change of character. The acts of the legislature making appropriations for the continued expansion of the institutions, including the development of graduate work, have established a presumption in favor of this interpretation.

The commission desires to call attention to one other aspect of the situation, however, which ought not to be overlooked. The college of agriculture and mechanic arts was created in response to the

Morrill land-grant act of 1862. In return for certain subsidies granted by the Federal Government at that time and at later times the State assumed the obligation to carry on instruction in agriculture and mechanic arts. Earlier in this chapter the commission expressed a belief in the substantial educational equivalence of the work carried on by the two types of institutions, the land-grant college and the State university. If this parity exists in other States, it certainly exists in Iowa. The commission is also about to recommend that graduate instruction and research work of the most advanced university type be encouraged at the Iowa State College. Nevertheless, such development of advanced work should relate itself exclusively to the limits established by the professional aims peculiar to the institution. This question is discussed at greater length in Chapters IV and V.

In closing this portion of the report, the commission desires to reiterate its conviction of the importance of applying strictly the principle of division advocated above to the work of the three State institutions. The State is probably rich enough to allow all of its institutions to develop as rapidly as the demands of students for instruction will warrant without regard to possible duplication of offerings. Indeed, the drawback to this policy is not primarily a financial one. It is rather that such a course will inevitably perpetuate intolerable mutual jealousies and antagonisms, tending to defeat all unity in the program of State education.

The five chapters following deal in some detail with various phases of duplication.

SUMMARY OF RECOMMENDATIONS.

1. The adoption of the principle of "major and service lines of work" at the three State institutions.

2. The creation of a conference consisting of members of the faculties of the institutions and the State board of education to adjust questions of overlapping not automatically determined by the establishment of major lines for each institution.

3. The readjustment of the work in engineering at the State university and the State college, according to one of three methods:

(a) A horizontal division, assigning graduate work to one school and undergraduate work to the other.

(b) The union of the two schools at one place.

(c) A vertical division of work, assigning some branches of engineering to one institution and some to the other.

4. The discontinuance of the last two years in liberal arts at the Iowa State Teachers College, with suggestion of three-year non-degree courses for rural and grade teachers.

5. The enlargement of facilities for practice teaching at the State teachers college.

6. The establishment of additional normal schools.

7. The addition of men to the faculty of the State teachers college, to give half of their time to instruction and half as members of the staff of the State superintendent of public instruction and the supervision of work in the normal-training high schools.

Chapter IV.

GRADUATE WORK.

Next to engineering the field of graduate work undoubtedly offers the greatest area for the development of unwarranted and expensive duplication. The State board's request that the commission investigate graduate work indicates that the board has appreciated the danger which lies in this direction. The subject has seemed to the commission second in importance to none of those upon which advice has been asked. An account of the actual present status of graduate work at each of the institutions is submitted herewith and the attempt is made to point out how the principles developed in the preceding chapter may be applied to the avoidance of serious duplication and the friction of competition.

Graduate work of a high character is, and ought to be, carried on with increasing efficiency at both the Iowa State University and the Iowa State College. At the Iowa State Teachers College, the degree of master of didactics is conferred for a professional course representing 45 term hours. This, however, does not constitute really a graduate school or college, but is work offered chiefly during the summer session for college graduates who wish to take up the study of professional subjects. It is more nearly an extended undergraduate course, with the requirement of a thesis, than organized graduate work based upon an undergraduate foundation.

STATE UNIVERSITY OF IOWA.

The graduate college of the State university grew out of a standing committee, first appointed in 1893, to define the terms for granting master's degrees. Work leading to the doctor's degree began in 1898, and the graduate college was formally instituted in 1900. Since that time it has made steady advance in organization and in standards. The commission commends cordially the general sincerity and progressiveness of the graduate work done at the State university, especially in certain thoroughly organized departments like education, philosophy and psychology, history, and political science.

The State university makes a distinction between the admission to the graduate college and admission to candidacy for a degree, and

endeavors to determine each case upon its own merits. This is in accordance with the common practice of graduate schools by which persons holding degrees from acceptable colleges are admitted probationally, and later, when they have demonstrated their capacity for work in the majors and minors selected, are admitted to candidacy for a particular degree. A student coming from a college about which there is question is tested by departments as to his major work only, but no test seems to be applied in regard to the general soundness of his training or the value of his minor work. The registration of students in graduate courses for the summer session appears to be handled more loosely than in the regular session, and the records of such students are in a less satisfactory condition. Neither in the regular session nor in the summer session does it seem to be necessary for a student registered in the graduate college to take any course designed for graduates only. A student who desires to enter the graduate college and take work only in a field for which he has had no preparation in his undergraduate work should be registered as an undergraduate, rather than a graduate, student until he is ready to carry advanced courses or courses for graduates only. The commission suggests the adoption of a rule by which no student may have graduate status unless a certain specified proportion of his registration is in courses for graduates only.¹

A candidate for the master's degree is usually required in this graduate school, as in nearly all the strong graduate schools, to do work in residence during one collegiate year of approximately 36 weeks. The State University of Iowa, in common with some other institutions, accepts resident work in four summer sessions of 6 weeks each (24 weeks) as a minimum for satisfying this requirement, but students have usually been required to prepare theses outside of this residence period. This is in contrast with institutions like the University of Chicago, which makes precisely the same residence requirement of students working in the summer as of other students. The State University of Iowa has, however, worked out a plan for supplementing in some degree the work of the summer session through "projected registration," by which a student who has been in residence in graduate status at the university for at least one sum-

¹The State university has one almost unique group of graduate students, those who are candidates for the M. S. in medicine, who have been recommended by the faculty of the college of medicine upon the basis of an M. D. degree. This represents the extreme of tolerance, since the announced requirement for admission of students to candidacy for such a degree is a satisfactory high-school course, plus a four years' course in medicine. The latter may be taken in a medical school which does not require any college work for entrance. The university announces no list of approved medical colleges whose graduates may be thus received. The work for the degree appears to be done mainly in absentia by practicing physicians. Two or three persons per year for about 10 years have been granted this M. S. degree. The registration for this degree has fallen off, however, so that the dean of the graduate school reports only one student so registered in 1915-16.

ner session may do work in absentia according to a plan agreed upon with some authorized instructor. Credits earned through projected registration may equal those previously earned in the same subject in residence. In a bulletin, the university states "that projected registration does not operate to reduce the residence requirement for a master's degree [but] may, however, operate to reduce materially the time requirement for earning the doctorate." The department of education is the one chiefly concerned with projected registration, since many of its students in research find their problems outside the campus and in connection with their professional duties. Some 12 or 15 students are thus registered and working in cooperation with certain departments upon problems for which they will later receive credit. Projected registration might be called the temporary substitute for the fifth or sixth summer session of work as a part of the requirement for the master's degree.

Graduate work is offered under 25 departmental headings, including engineering, archæology and the history of art, home economics, histology and embryology, and five other departments in the college of medicine. The apportionment and scope of the graduate work in the university seems to be variously determined, by the graduate faculty (all full professors giving graduate work), by the graduate council of seven men (one elected by the graduate faculty for a seven years' term), or by the quality of leadership in particular departments. Individual instructors get their authority to give graduate courses from the departments. There is consequently a wide difference in the amount and spirit of graduate work in different departments. In one department, for instance, there are 16 persons, of whom only 1 is a full professor. It was stated to the commission that but one of these was distinguished for the published results of his research, though several others are directing thesis work or engaged in "creative work" or in various kinds of learned activity, which are regarded as on the same basis as research.

It is clear to the commission that the university can not do equally strong work in all the departments announcing graduate courses, even if an equal number of graduate students should appear for each department. Like every other university which does graduate work, it must choose which departments shall be encouraged to undertake work of an advanced sort, leading, for example, to the doctor's degree. This determination should be made by a body competent to express the judgment of the institution as a whole, and the expression of this judgment should result in the formulation of a system or policy for the best utilization of such portions of the energy of the institution as may be devoted to graduate work. The commission did not get the impression that the State university was thus developing its graduate work. Too much appears to be left to

the will of the head of the particular department as to whether his department shall give courses, for example, which will lead to the doctor's degree. By vote of the graduate faculty, or, perhaps, better, of the university senate, a body which has no "board" on graduate work and which seems to fall short of realizing its possibilities, certain departments should be especially encouraged to develop the most advanced courses of instruction and research, by special care in selecting new men, by the encouraging of the promising research workers already on the staff, and by generous appropriations in the university budget. In this way the prestige of the university will be more enhanced than by trying to keep all departments on an even front. Fluctuations in the strength of departments are bound to occur with the coming and going of strong, productive men, but the accumulation of library and apparatus will fluctuate much less under the policy here suggested. By way of illustration, the university is peculiarly fitted to carry on the finest sort of graduate work in geology; it is already strong in physics, psychology, and education; it ought not to attempt, on the other hand, to build up courses in entomology, agronomy, or plant breeding.

IOWA STATE COLLEGE.

The graduate division of the Iowa State College should, in the judgment of the commission, develop naturally and properly out of certain sections of the undergraduate work. It should follow those major lines of work for which the institution is constituted. Its graduate work, therefore, should be supplementary to that of the State university, and coordinate with it, but without any such overlapping as is permissible and perhaps desirable in the first two years of undergraduate curricula in certain courses. Wherever this institution or the State university diverges from this principle, it should be brought back by the board or by some other correlating agency.

The graduate division of the State college, which was established in 1913, offers major and minor work for the master's degree in 18 subjects, "with special application to the industries." Aside from those subjects which are unquestionably related to the major lines of agriculture, engineering, etc., there are included in this group, mathematics, economics, geology, chemistry, and zoology. The subjects or departments in which the degree of doctor of philosophy may be taken are decided upon by the faculty of the graduate division, subject to the final determination of the matter by the board of education. At present they are the following: Agronomy, animal husbandry, bacteriology, botany, chemistry, dairying, geology, horticulture, and zoology.

The conditions upon which professional degrees in engineering are granted are: (1) Graduation from a four years' curriculum in engineering, one year of residence study, and one year of professional experience, and the preparation of a satisfactory thesis; (2) graduation from a regular four years' curriculum in engineering, five years of professional experience, and the preparation of a satisfactory thesis; (3) graduation from a regular five years' curriculum in engineering, one year of professional experience, and the preparation of a satisfactory thesis. The degree of master of agriculture requires graduation from a four years' curriculum, five years of experience in practical or professional agriculture, and the presentation of a thesis. The combination degree in agriculture and engineering is granted by the cooperation of the two divisions.

Admission to the graduate division, of which the president is the acting dean, presupposes graduation from a college or university of approved standing. In addition, evidence of the necessary prerequisite training for the course to be pursued is required, since it is quite possible that a graduate from a narrow arts curriculum would find himself wholly unprepared to undertake graduate work in a subject like crop production, in which the college offers work leading to the degree of doctor of philosophy. For the master's degree, one year of work in residence and the completion of 30 hours are ordinarily required. Of the 30 hours, 20 must be, and all of the 30 may be, in the major subject. The catalogue states that major work will ordinarily be restricted to graduate subjects. Under certain restrictions, one-half of the work required for the master's degree may be done in absentia. In these cases, the residence work may be accomplished by three summer sessions of six weeks each. The requirements for the degree of doctor of philosophy follow the usual announcements in such matters, except that of the three years of graduate work required only one appears to be necessarily a year of residence work, and that at the State college.

An examination of the records of graduate students admitted during 1914-15 indicates an unusually generous judgment of the sufficiency of the curricula of several institutions from which students have come, as a basis upon which to build graduate work. It is evident to anyone who knows much about these institutions that their curricula can not be the equivalent of those of the Iowa State College or of "other colleges and universities of approved standing." In other words, it is educationally impossible to combine in the same graduate courses, without sacrifice of standards, students who have had seven or eight years of work above the eighth grade and students who have had six years of work above the eighth grade. The larger number of students registered in the graduate division hold degrees from Iowa State College or from other institutions of unquestioned

rank, like the State University of Iowa, the University of Nebraska, Grinnell College, or the Ohio State University. Mixed in with these are a considerable number of students from institutions which have hitherto required for admission only one or two years of high-school work, perhaps 10 units. Seven students from Oklahoma Agricultural and Mechanical College appear in the enrollment, two from Kansas State College, two from Clemson College (the South Carolina Agricultural and Mechanical College), three from Oregon Agricultural College, and one from Mississippi College of Agriculture and Mechanic Arts. Some of these students came directly to Ames after their graduation.

The largest number of graduate students in any one department is in agronomy. In 1914-15 there were in residence 10 students; 1 each in soil fertility, soil physics, and farm management; 3 in soil bacteriology; and 4 in crop production. In 1915-16 there were 9 students; 1 in soil fertility, and 4 each in soil bacteriology and crop production. The men for 1915-16 were selected from some 35 or 40 applicants. Among those selected were graduates of Texas Agricultural and Mechanical College, Oklahoma Agricultural and Mechanical College (a bachelor of science, 1915), and Clemson College.

The commission is of the opinion that much greater care should be exercised by the graduate division of the State college in admitting students from institutions whose work is not based squarely on the requirement of a standard high-school course, representing at least 14 units. In justice to the Iowa State College it should be said that it is not alone in this practice of objectionably lax admission to its graduate school of students coming from agricultural and mechanical colleges which have not yet seen their way clear to the enforcement of standard entrance requirements. The continuance of this practice is bound to reflect upon the standards of Iowa State College, in that students who transfer from its graduate division to other graduate schools, like Chicago or Cornell, will be very likely to be discounted in their credits earned at Ames.

Certain of these institutions have, to be sure, recently raised their entrance requirements. Students graduating before 1914, however, entered before these improvements in standards.

The commission recognizes the difficulty which now exists and which is bound to continue in defining the scope and upreach of the graduate work which should be carried on by the State university and the State college. As a means of making the adjustments that will be necessary as long as the departments in these institutions are directed by strong, vigorous, resourceful, ambitious, scholarly men, the commission recommends the creation by the board of education of a standing committee on graduate work to be composed of two of its own members and three members each from institutions

giving graduate work, the latter to be elected for a term of years by the graduate faculty in every case. It is further recommended that this committee be granted power to review the present offerings of graduate courses, to make such definitions and adjustments between institutions as may be required in order to secure conformity to the principle of major lines enunciated elsewhere, and that no institution under the authority of the board shall inaugurate any new lines or announce any new courses without the approval of this committee in advance. Through such a committee the graduate work of the various institutions will be subjected to at least an annual review and discussion not by an outside body but by men who are actively engaged in building up graduate and research work in the State institutions. It is conceivable, for example, that such a committee would decide that graduate work and research in such subjects as history, modern languages, political science, psychology, mathematics, and education ought to be developed only at the State university; that such subjects as agronomy, animal husbandry, horticulture, and entomology should be developed only at the State college; and that certain specified branches of such subjects as chemistry, botany, zoology, and bacteriology may be properly developed in one location or the other, but without duplication.

In making this recommendation, the commission would make it perfectly clear that the purpose is to promote, rather than limit, the development of graduate and research work, which shall be fostered by the combined wisdom of the great institutions of the State and backed by the resources of a rich Commonwealth.

SUMMARY OF RECOMMENDATIONS.

1. The encouragement of the development of graduate work at the Iowa State University and the Iowa State College of Agriculture and Mechanic Arts along the major lines of the institutions.

2. The adoption of a rule by the university according graduate status to none but students having a definite proportion of their registration in courses for graduates only.

3. The determination by the university senate, or some other representative body, of the departments to be encouraged to develop graduate courses.

4. The exercise of greater care by the graduate division of the State college in admitting students from other institutions to graduate standing.¹

5. The creation of a standing committee on graduate work, to consist of two members of the State board of education and three members each from the institutions giving graduate work, the latter to be elected for a term of years by the graduate faculties.

¹ An announcement now coming out provides for exclusion of graduates of low-grade schools.

Chapter V.

LIBERAL ARTS WORK IN THE IOWA STATE COLLEGE.

The commission has been asked by the State board of education to investigate the following question: "Does the liberal arts work offered at the Iowa State College of Agriculture and Mechanic Arts come within the proper scope of that institution when considered in connection with the other educational institutions of the State?" In the judgment of the commission, the issues raised by this question, as by the question relating to graduate work, are vital. They lie at the very root of the State's higher educational problem. Special attention has, therefore, been given to the subject, and a detailed discussion of principles and practices is presented in this chapter and in the appendix.

The necessity of introducing some courses in liberal arts and science subjects into the curricula leading to the various degrees at the Iowa State College will not be disputed. While the work prescribed for degrees in agriculture, engineering, home economics, veterinary medicine, etc., is more or less technical in all the State universities or land-grant colleges, such work is nevertheless undergraduate, and, with the possible exception of veterinary medicine, not professional in its nature. It is now upon a scientific collegiate basis, rather than upon a mechanic arts or purely vocational basis. The first two years of the undergraduate curricula in agriculture and engineering in nearly all of the strong universities of the United States and in specialized institutions like the New York College of Agriculture in Cornell University and the Massachusetts Institute of Technology are largely made up of work in the fundamental mathematical and scientific subjects, such as botany, chemistry, mathematics, and zoology, in combination with varying amounts of English composition and literature, history, modern languages, economics, political science, and sociology. It happens not infrequently also that general or survey courses in the latter group of subjects are put into the last two years of the undergraduate course. It is of the greatest importance in this connection to keep clearly in mind the distinction, which is elaborated elsewhere in this report, between the major lines of work in an institution like the Iowa State College, and the group of liberal arts and science subjects here under discussion. The latter are and ought to be auxiliary or service subjects, which serve either as the foundation or as buttresses for the main structure.

The principle on which liberalizing subjects, whether humanistic or scientific, should be included in the schedule of work of an institution organized by the State for the express purpose of developing

curricula in agriculture, engineering, etc., may be stated thus: Only such liberalizing subjects should be incorporated in the offerings of the institution, and only in such amounts, as will wisely reenforce the technical or semitechnical specialized curricula for whose development the institution was constituted. In all institutions like the Iowa State College attempts to develop courses in these subjects for themselves are certain to be made. Strong teachers will naturally urge elaboration of the subjects in which they are interested, sometimes in disregard of the purposes of the institution as a whole. Courses may even be offered as a means of holding students already registered who have changed their professional or academic intentions. If there be such students in the institution, they should, of course, be directed to seek instruction in other institutions emphasizing other curricula.

It is the commission's opinion that all these attempts should be checked by the governing board, even though the plea be made that the cost of such tentative development is small, or that the number of students is not large, or that a *local* demand is to be met. To take specific examples, the development of extended courses in psychology, in the history and theory of education, in political science, or in advanced mathematics, in the Iowa State College should be authorized by the board only upon proof that such courses are indispensable for the purpose of supporting regular work in the major lines already mentioned. The problem of the relation between undergraduate work and graduate work in the different departments in the Iowa State College is more fully discussed in another place. If the principle of the establishment of major lines of work, forming the main structure in the curricula of the State institutions, be accepted, another principle will be at once clearly defined. All departments of an institution must be treated alike in the matter of thoroughly adequate provisions of men and apparatus with which to do the work required by the purposes of the college. All departments need not be treated alike, however, in facilities for expansion and outreach into graduate courses and research. A service department is a service department and not a major department, and it must so remain, if waste and unwarrantable duplication of effort and expenditure are to be avoided.¹

¹ Certain departments, like chemistry and botany, by their intimate and organic relation with the research work of experiment stations, will need to develop specialized forms of work in the direction of major lines; for example, soil chemistry, organic chemistry, plant pathology, and dairy bacteriology. But in all such cases a clear differentiation of departmental functions should be enforced, for the State does not need two groups of research men and two research laboratories for plant pathology or dairy bacteriology. It is even conceivable that a strong man in one of the other State institutions might develop his talents along one of these lines to a point which would make it desirable to transfer him to the State college staff instead of continuing his work on the old location.

Courses in practically all of the subjects referred to above are taught in the Iowa State College and embodied in widely varying proportions in the curricula leading to different degrees. Some of them, for example, English and mathematics, are required of nearly all students in agriculture, engineering, and home economics. The commission finds no evidence that the number of instructors in these fundamental subjects, as taught in the first and second years, is too large or that the services of these instructors are uneconomically utilized. Furthermore, the number of semester hours required in these subjects in the curriculum of the first two years does not appear excessive or ill balanced. Work in English composition, elementary mathematics, and like subjects for students of the first and second years, if the number of students in each place exceeds 200, is probably carried on just as economically and just as effectively in two or three places as in one. Two hundred students will keep fully occupied two instructors in first-year mathematics, two in chemistry, and two in rhetoric; similarly, laboratory space for 600 first-year students in chemistry and zoology would not be greatly economized if work were to be done in one place, as contrasted with a more or less equal distribution of it in three places. In other words, the commission finds no evidence of unnecessary or wasteful duplication of work of the first and second years in the three State-supported institutions in Iowa. Each has its corps of instructors for these years fully occupied, and pressure upon its space for the work of these two years is not below normal.

Substantially the same thing is true of the essential service courses in the third and fourth years in the curricula in agriculture and home economics in the State college. The prescribed courses in such curricula, in mathematics, physics, chemistry, botany, zoology, English, economics, education, and psychology is warranted by the normal needs of these groups of students. In order to meet the requirements of the State law in regard to the certification of teachers, students who wish to be prepared upon graduation to teach agriculture, home economics, and manual training must have had instruction in certain prescribed subjects. The obligation to give this instruction can scarcely be called optional for the institution unless some device is worked out by which a student may obtain these courses elsewhere through an organized plan of inter-institutional movement of students. Such plans are not yet common in America.

In the more advanced and specialized courses the commission finds considerable duplication of courses offered elsewhere. Much of this seems unwise and unwarranted when judged by the principle announced by the college as covering its service departments of instruction. The commission finds an illustration of this tendency in the

department of chemistry. The college must maintain its undergraduate work in chemistry upon a high level; it must provide every necessary facility for the chemical side of the work of the agricultural and engineering experiment stations. Undoubtedly it must also develop certain lines of graduate work in chemistry connected with the agricultural experiment station, which has a special obligation to the Federal Government and the engineering experiment station. It does not follow, however, that the college would be warranted in attempting to establish a great school of chemical instruction and research, covering every phase of the vast and varied subject. If the State is to support several departments in different institutions, it may well insist upon strictly defined specialized lines for each institution. Unquestionably the State college must undertake a great development of chemical research as related to agriculture, but the preparation of men to be research workers in numerous other branches of chemistry is not necessarily an obligation laid upon the State or upon this particular college.¹

The commission recommends a thorough-going revision of the announcements of this department and the elimination of all courses that are not strictly in conformity with the principle of the development of major lines, and do not directly reenforce the work of the experiment stations. An advisory committee of members of the American Chemical Society, who have no relation whatever to the State college and State university, could undoubtedly assist the board very materially in determining the lines of advanced work in chemistry which each institution should cultivate.

The charge has frequently been made and widely believed that the Iowa State College has endeavored to build up a curriculum in liberal arts and sciences leading to a nontechnical degree either in general science or in arts. The present president of the college and others in responsible positions disclaim in most explicit terms any attempt to build up such a curriculum. They insist that only such liberal arts subjects and only so much of such subjects will be taught by the institution as will be needed for a properly balanced and enriched curriculum in agriculture, engineering, home economics, and veterinary science. While the commission accepts this statement as an accurate description of the present intention, there is some evidence that an attempt was made at an earlier period in the history of this college to formulate a curriculum which might have been described not inaccurately as a curriculum of liberal arts and sciences, even though it was not intended to have it lead to the degree of bachelor of arts. The commission found some conflict of testimony as to the

¹ For a comparison between the offerings in chemistry by the Iowa State College and by other institutions, see Appendix, p. 141.

definiteness and vigor of this attempt. Possibly part of the difference of opinion rose from the difference of concept as to what was meant by a general or a liberal arts course. Since both the humanities and the sciences are now accepted as proper liberalizing disciplines, the commission does not distinguish between a curriculum in which a student may major in geology or mathematics and receive a degree of bachelor of science in general science, and a curriculum in which a student may major in philosophy or economics. Courses offered in several departments in the general catalog for 1915-16 indicate a past or present ambition to expand certain subjects beyond the needs of the curricula in which they constitute a subsidiary element.

It is necessary, therefore, to examine the contention that all the work in liberal arts and pure science now offered is primarily subordinated to the interests of students taking one of the curricula leading to degrees in agriculture, engineering, home economics, etc. In place of the "colleges" commonly found in the larger universities, this institution has a grouping of departments designated as "divisions," for example, the division of engineering, the division of agriculture. It is evident that the division of industrial science is constituted in a different manner from the other divisions, and that the procedure of a student in this division, if not his original intention, is likely to differ quite markedly from the procedure of a student who enters upon the curricula in agriculture or engineering. The catalog for 1915-16, page 232, states:

The courses in industrial science are not "liberal arts courses." They are courses intended to fit the student for certain specialized fields of professional activity * * *. An opportunity is offered for the election of an amount of general work approximately equal to that allowed or required in other technical courses of the institution * * *. Neither are those courses to be regarded as *general* science courses, for as soon as the scientific and linguistic foundation of the freshman and a part of the sophomore year has been secured, the student is required to specialize in some science and to relate it definitely to its industrial and professional phases.

The division of industrial science includes the departments of—

Bacteriology and hygiene.	Mathematics.
Botany.	Military science and tactics.
Chemistry.	Modern languages.
Economics.	Music.
English.	Physical training.
History and psychology.	Public speaking.
Library.	Zoology.

Logically geology and physics should be here, but they are, as it happens, departments in other divisions.

In the division of industrial science there are four curricula leading to the degree of bachelor of science with major work in one of the following departments:

Bacteriology and hygiene.	Mathematics.
Botany.	Physics.
Chemistry.	Veterinary anatomy.
Economics.	Veterinary pathology.
Entomology.	Veterinary physiology.
Geology.	Zoology.

Special groups in this department are:

Applied botany.	Applied entomology.
Applied chemistry.	Applied geology.

Joint or five-year curricula are offered in chemical engineering, agricultural engineering, and home economics. A six-year combined curriculum with veterinary medicine is also provided.

The curriculum of the freshman year in industrial science "leading to the degree of bachelor of science (in some major science)" has no industrial subject whatever in its total of 34 or 37 hours, unless 2 hours of the industrial history of the United States or of the economic history of American agriculture be so characterized. In this respect the curriculum does not greatly differ from the curriculum in agriculture. In the sophomore year, 16 hours of "science electives" and 12 hours of free electives are included in the total of 36 hours. The only industrial subjects that appear here in the science electives are veterinary anatomy, veterinary pathology, and veterinary physiology. The major for the junior and senior years requires that at least 20 hours out of a total of 64 shall be chosen from the major subjects enumerated above.

From these statements it appears that a student in getting his bachelor of science degree might reduce the elements which are really industrial to a very low minimum. If his major were in economics, mathematics, or geology, he would have 2 hours of industrial subjects in the freshman year, none in the sophomore year, and a maximum of 24 in his junior and senior years, with a possibility of materially reducing the 24 with the approval of the proper authorities. This is not far from the substance of a curriculum in liberal arts and sciences. The distinction between a major in geology and a major in history is not material, if the principle of prescribed courses along major technological lines, in accordance with the purpose of the college, is accepted. While the curriculum does not permit a major in such humanistic subjects as English, modern languages, and education, each of these subjects may have a considerable representation through the free electives.

It does not appear that many of the relatively small number of students taking the degree in industrial science have been allowed to abuse the opportunities which exist for making extreme schedules.

In the following paragraphs the offerings of three of the departments included in the division of industrial science are analyzed with a view to determining how far they have conformed in their development to the limitations laid upon them as service departments subordinate to the major technological lines of the college. An analysis of the offerings of four other departments in the same division is given in the appendix, page 140.

An analysis of the department of English and the department of literature, which appear to be really one department, shows that the principle of subordination of the work of these departments to the major purpose of the college is well followed out. The unexpectedly large number of courses in these departments is due to the splitting up of the elementary work into courses which, in the main, duplicate each other, having slightly varied credit values for different groups of students—for example, those in home economics or in agriculture. In English 15 courses are announced, of which 1 set of 2 courses, with 3 credit hours each, is designed for agricultural engineers; another for agricultural students; still another, with 2 hours' credit, for women. The total offerings, including these duplicates, are 36 semester hours, or, eliminating duplications, 22 semester hours.

In literature an elastic scheme of credit is elaborated. Literature 1, for example, may be taken for 1, 2, 3, or 4 hours' credit. The maximum obtainable in the general courses is 14 hours. An unusual group is described as "Literature as related to technical subjects and courses." One of these courses is "The scientific age in literature." Others are "Literature of farm and community life," "Reading for children at home and at school," and "The farm library." The total offerings in this group in the department of literature are 18 semester hours. No courses open to undergraduates and graduates, or to graduates only, are offered in these two departments.

The announcements in the department of economic science ("Applied economics and social science") indicate a disregard of the sentiment which has kept English and literature purely service departments. Six courses, totaling 16 semester hours, are for undergraduates. Twenty-four courses, totaling 17 semester hours, are for undergraduates and graduates, including two "seminar" courses ("current events," "reading economic magazines"), and one in research, involving public utilities, speculation, and "various other problems and phases of social and industrial life." One course in thesis and research work is for graduates only. The head of the department states that each course is given a distinctly agricultural or engineer-

ing bent and that it justifies itself as a semitechnical or industrial course, as distinguished from a liberal-arts course. It is the opinion of the commission, however, that so large a number of courses is unnecessary for the support of the allied interests, and that the wide differentiation indicated by the titles just quoted scarcely represents present institutional necessities. The commission would point out that the importance of a very thorough training in the principles of economics for an engineer who wishes to do research work in railroad rates, or in municipal or financial direction of public utilities, does not constitute an obligation on the part of this college to give such instruction, merely because it maintains a college of engineering and an engineering experiment station. A student wishing to make this combination of economics with engineering would do far better to go to an institution making a specialty of graduate work in economics. The State and the State college would be the gainer by such an arrangement, and would avoid the criticism which might be leveled at the present tendency to develop advanced and graduate courses in economics in this institution.

The courses in geology are designed—

to meet the requirements of students in civil engineering, students in the division of agriculture, students specializing in geology and botany, students in mining engineering, those who expect to become mining geologists and professional geologists, and students taking general courses.

Accordingly, a student's major may be in geology in the division of industrial science. In so doing he would take a maximum of 49 hours in geology, mineralogy, and physiography, without choosing any electives from these subjects, save as alternates for prescribed courses. This curriculum, with geology as major, whether designed for professional geologists or "students taking general courses," does not differ materially from that which could be taken in a standard college of liberal arts and sciences, perhaps leading to an A. B. degree. It could not justly be described as auxiliary to any technological or semiprofessional purpose in agriculture or engineering.

In the department of geology 28 courses are announced—4 for undergraduates, 18 for undergraduates and graduates, and 6 for graduates only. These represent a total of about 95 semester hours, covering work in geology, mineralogy, petrology, petrography, stratigraphy, cartography, physiography, and meteorology. The staff of instruction consists of one professor, who is also professor of engineering and vice dean of the division of engineering, and one assistant professor. Six graduate courses are announced by the professor, with no indication of alternation in the giving of the courses year by year. Special work in the thesis course, with five hours' credit, may be taken in such specialties as metamorphism and stratigraphic geology. Except for the courses that may be used for a major in

industrial science or in one of the "general courses," the amount of work called for in this department by students in agriculture and engineering, even including mining engineering, would not require more than one-half the present offerings.

The commission is clearly of the opinion that the work of this department, as announced in the catalogue for 1915-16, indicates the existence of a large duplication of the work done at the State university. Geology as a major subject in the curriculum in industrial science and in any other curriculum designed to train professional geologists should be eliminated from the State college. The State does not need two research or graduate departments of geology, for the number of graduate students is not likely, in the near future, to be very large. The State university is in direct contact with the office of the State geologist and the great collections belonging to that office. Because of the development already attained at the State university under these conditions, that institution is the logical and proper place for training all students who wish advanced work in geology. At the State university 19 courses, totaling 59 hours, are offered, besides 6 research courses, for which specific hours of credit are not announced. The department includes the same general scope of work as at the State college, and instruction is given by two professors, one instructor, and one assistant.

The State college must, of course, provide general courses in geology, meteorology, etc., in a service department conducted as such for students in agriculture and engineering, but the department of geology should be kept at that limit. If, as is quite possible, a student should now and then be developed who desires to make geology a profession, or who seeks to strengthen himself as a mining geologist, provision should be made for his transfer to the State university or to some other institution with a sufficient number of mining or geological students in its advanced or graduate courses to give a distinctly professional atmosphere and momentum, to create in him a real scientific or professional enthusiasm. In 1914-15 the registration in mining engineering in the State college was: Senior class, 3; junior class, 4; sophomore class, 0; freshman class, 3. A group so small, even if kept carefully segregated, would be practically lost in the body of engineering and agricultural students.

In order that the State college may avoid all further suspicion that it is endeavoring to build up a curriculum of liberal arts, the commission recommends that its officers take immediate steps (1) to confine the offerings of the departments included in the division of industrial science to such scope as is appropriate to purely service departments and (2) so to recast the requirements for the degree of bachelor of science in this division as to render it impossible for

ny student to secure the degree without pursuing industrial or professional courses to an amount substantially equal to that required in other technical courses in the institution. These steps the commission thinks are necessary to make the work in this department coincide with the catalogue announcement quoted on page 70.

SUMMARY OF RECOMMENDATIONS.

1. The strict enforcement by the State board of education of the principle that departments of liberal arts and sciences at the Iowa State College of Agriculture and Mechanic Arts shall be simply service departments; especially the revision of the work offered in the departments of economic science, geology, physics, and mathematics to secure conformity to this principle.

2. The abandonment of courses in chemistry at the Iowa State College which neither contribute to the major lines of that institution nor reinforce the work of the experiment stations.

3. The revision of the requirements for the degree of bachelor of science in the division of industrial sciences to render it impossible to secure the degree except on completion of industrial and professional courses (in contradistinction to liberal arts courses) equal in amount to those required in technical curricula.

Chapter VI.

EXTENSION WORK.

The State board's memorandum, which in general has served as the commission's guide, says, under the caption "Extension Work":

Would it be feasible or wise to consolidate the extension work of the three institutions under one head which would represent the institutions collectively and correlate the work? * * * More or less duplication is sure to result if this work is carried on independently. Your advice touching these points will be much appreciated.

The extension work of institutions of higher education is the making of some part or parts of the institution to the people where they live. It is of two rather distinct kinds: (1) The giving of courses of instruction in the localities, representing similar courses at the institution itself; (2) instructing and aiding the people by means of many varieties of welfare work, rather than by recognized courses or sustained periods of instruction.

The former is the true university extension—the extending of the institution, by means of summarized and popularized courses of lectures and reading in the subjects that are regularly included in its curriculum. This formal type of enterprise at present occupies a very minor place in the extension field. An institution may now lend itself in many kinds of helpfulness and cooperate with any

number of agencies and organizations, to disseminate information, to aid a person in his occupation, to meet the problems of a community, to set new forces in operation, to organize the intelligence of a constituency. This latter type of extension work has come primarily out of the land-grant colleges on their agricultural side, being an expression of their desire to reach a manifest need and to make the widest application of public funds. It is the expression of a new or decidedly modern intention in education. It is now recognized as a form of national as well as institutional effort, in the Smith-Lever bill, which was signed by President Wilson May 8, 1914, and which provides Federal appropriations for extension work in cooperation with State appropriations. This kind of extension enterprise is now reacting strongly on the older kind and on liberal-arts institutions.

In the State of Iowa the older form of university extension was early undertaken by the State university, and, although it is yet continued to some extent, the welfare type is now, as elsewhere, greatly in the ascendancy.¹

The Smith-Lever Act defines cooperative agricultural extension work (as conducted by the State college) to be "the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, and imparting to such persons information on said subjects through field demonstrations, publications, and otherwise." Aside from a flat appropriation of \$10,000 to each State (\$480,000 for the United States), the proportion of the Federal appropriation that goes to any State is determined by the ratio that the rural population of the given State bears to the rural population of the United States, as shown by the next preceding Federal census, on condition that a sum equal to that which comes from the Federal funds shall be provided within each State. The total appropriation for cooperative agricultural extension that must be equaled by other than Federal funds will be \$4,100,000 when the operation of the bill matures; it began with \$600,000 and increases \$500,000 each year for seven years.

With the enlargement of the fields and intentions of higher education, extension work, as well as graduate work, is a natural expression of the institution. It does not follow, however, that every department or unit in an institution may engage in extension work. The department must first be organized and developed effectively for its regular college teaching; the extension work, if it comes at all, should be the result of this internal maturity. In the case of more

¹ At the State university extension work was formally inaugurated by faculty action in October, 1891. Lectures of extension character were, however, given in 1887.

At Iowa State College extension work has been conducted almost since the foundation of the institution, and was being carried forward on a considerable scale when the first State appropriation was made in 1906.

or less competing institutions in any State, founded on public funds, there must also be a good working understanding between all of them. Manifestly, the division of extension work between such different institutions can not be geographical, particularly if the institutions are chartered as State institutions covering the Commonwealth. The differentiation must lie primarily in the dividing of subject matter, recognizing the fact that the cooperative extension work of the land-grant colleges is clearly defined by Federal statute.

The extension enterprises issuing from the three institutions in Iowa are uncorrelated. While there is no particular or damaging duplication at present, there is nevertheless danger in the situation, especially in municipal engineering and related lines, and the longer the condition continues the greater will be the likelihood of conflict. The difficulty lies in the nature of the situation in Iowa, whereby the people have not, by statute, accurately defined the spheres or at least the intentions of the institutions. No real reduction in the overlapping of public effort can be accomplished in the extension work unless it is accomplished also in the regular collegiate work. The remedy lies in adopting the principle of the major line of work elsewhere advised; from these major lines the extension enterprises may develop regularly and fully. This procedure would also have the effect of solidifying the extension enterprise within the institution itself, making it a regular part of the institutional life, issuing from the major lines, rather than a thing apart, organized in entire separation—although, of course, the administration of extension work will always demand special offices and sets of officers.

The commission recommends, as a means of reducing differences and adjusting difficulties between the three institutions in the field of extension work, that the board of education establish a conference composed of the persons immediately responsible for extension in each of the institutions and of a small special committee of the membership of the board itself, this conference to meet for discussion before the main enterprises for the year are laid out by the different institutions and as often thereafter as may be advisable. This conference should constitute a committee or council of guidance, without legislative authority.¹

SUMMARY OF RECOMMENDATIONS.

1. The strict application of the principle of the major lines of work to the development of the extension enterprises of the three State institutions.
2. The establishment of a conference on extension work composed of members of the board of education and extension officers of the three institutions to discuss projects.

¹ For an account of the methods and scope of the extension work of the three State institutions, see Appendix, p. 145.

Chapter VII.

DUPLICATION OF WORK IN PSYCHOLOGY AND EDUCATION.

The Iowa State Teachers College, at Cedar Falls, necessarily offers those subjects that are of special value to the professional training of teachers. Psychology and education are consequently furnished in reasonable amount, about 20 term hours of the former, about 30 of the latter (exclusive of some 20 hours of observation and practice teaching), and 2 hours each of logic and ethics.

This statement represents the operation of the schedule when repetition is disregarded. As a matter of fact three of the 5-hour education courses are given four times a year, another three times, and two twice in the year. So the total number of hours offered to students runs much higher than the figures given, although no one student could secure (exclusive of practice teaching) credit for more than the amount first mentioned. This program involves materially more, both of psychology and education, than the State law requires for first-class teaching certificates, but not more than is appropriate in a professional institution of this kind. Indeed, there might well be some development of the work in lines now either unrepresented or too meagerly represented.

At the University of Iowa there has been for many years a department of education and also a department of philosophy and psychology. In 1913 there was established a college of education with its own dean and special staff, which therefore replaces the old department of education. In recent years, in connection with the general growth of the university, a considerable amount of graduate work has been developed both in psychology and education. The organization of both branches of work appears to be sound, and the large number of students electing courses in these departments would seem to indicate that they are fulfilling in large measure a need definitely felt by the student body. No doubt the attendance of students on these courses is largely affected by the State law, which requires that first-class teaching certificates may be issued only to persons who have successfully passed 6 units of work in psychology and 14 units of work in education. At the present time the college of education is offering roughly 50 credit hours, excluding research work, but including the summer term; the department of philosophy and psychology offers in psychology approximately 36 hours, exclusive of research and inclusive of the summer session. These figures are approximate only, because the work necessarily varies slightly from year to year and is likely to be particularly variable in the summer term. Both departments are handling large groups of students in a creditable manner. (See Table 6.) There

would seem to be no reason why they should not be permitted to develop in response to any genuine demands as rapidly as the financial resources of the institution and a just regard to the similar development of other academic interests will permit.

One point at which difficulty has been encountered relates to the state law requiring that the schools shall offer instructions in household economics, agriculture, and manual training. Through its existing departments the university has been in a position to furnish proper instruction in domestic science and to do something toward training in the manual arts, but it is obviously not properly equipped to offer work in agriculture. Nevertheless, there are on its grounds at all times a large number of young people planning to fit themselves for the work of teaching in the schools of the State where they are likely to be called upon to offer or supervise elementary instruction in agriculture. More pressing has been the need of teachers already in the field who have not had this training, and who, in order to comply with the law, must secure such instruction at the earliest possible moment. Many such teachers can only come during the summer term, and the university has accordingly been put under pressure to furnish instruction in agricultural subjects at that time, whatever it might do during the remainder of the year. It need hardly be said that such work in the nature of the case duplicates to some extent work given at Ames and at Cedar Falls.

Work in psychology has been offered at the State college ever since its foundation. At first the offering of courses was very modest and designed to give a general introductory discipline to such students as might in point of fact be expecting to teach. With the rapid growth of the work in domestic science, and with the increasing emphasis on agricultural instruction in the schools, occasioned by the legislation so often referred to, it has come about that the number of students at any one time on the grounds at Ames expecting to become teachers is very large, running well up into the hundreds. The college has not unnaturally felt that it owed these young people the opportunity to train themselves reasonably for their function as teachers, not only in their subject matter, but also in those accessory branches most directly related to the technique of teaching, two of which, pedagogy and psychology, are actually required by the law. (See Table 6.) In response to these motives, the work in education has been developed very rapidly since 1911; the work in psychology somewhat more slowly, but nevertheless definitely. The program schedules approximately 24 semester hours of education, disregarding practice teaching (6 hours) and research, and 23 hours of psychology, including 2 of ethics; 16 hours of the education work are repeated in the summer, with 4 hours of practice

teaching work; 11 hours of psychology are thus repeated. The amount of work so offered is in theory designed simply to comply with the minimum requirements of the law; that is to say, 14 units of education are ostensibly offered and 6 units of psychology. As a matter of fact, appreciably more than this is offered, but under the conditions of election of courses that exist at the State college, it is probably true that no single student would normally find it possible to secure more than the amount called for by law. Evidently this can not be profitably taken all in one term, and if spread out to cover several terms, it almost inevitably results that the total amount offered is in excess of this legal requirement.

In the summer term teachers are coming in increasing numbers, as they are at the State university and at the State Teachers College, to equip themselves to meet the demands for instruction in agriculture, domestic science, and the manual arts. With the facilities available at Ames it is obviously possible to give admirable opportunity for accomplishing this particular purpose. In conjunction, however, with such courses the authorities at Ames have seen fit to offer an appreciable number of other courses covering work in school administration, in the principles of teaching, etc., work which has been most highly developed heretofore at the State university.

It appears, therefore, that as between Iowa State College and the State university there is at present an appreciable overlapping of work in psychology and education. That elementary psychology must be given at both places is apparently agreed upon by all concerned. That the work at the State college may well touch upon educational psychology and some of the more practical of the applied branches of psychology is also not called in question. There appears to be no intention to go further than this, and there is consequently at this juncture no division of opinion as between the authorities at the State college and the State university regarding the appropriate policy to be followed. The more advanced work will continue to be developed and carried on at the State university as in the immediate past. In education, however, while there is again no disposition to question the wisdom and necessity of giving the more rudimentary instruction in education at both places, such for example as courses in the history of education, in general methods, and the like, there is a division of opinion regarding the extent to which work in agricultural education may be properly undertaken at the State university, and regarding the extent to which work in school administration, with special reference to the interests of superintendents and supervisors, may be justifiably developed at the State college.

In view of the very great difficulty in training teachers so that they may comply with the new State law, it seems probable that the

resources of all the State institutions will for several years be strained to the limit, especially during the summer term. It is, therefore, very doubtful whether there ought to be any external limitation put upon the facilities offered at the several State institutions for giving work in home economics, agriculture, and manual training until the present force of teachers in the State schools has become satisfactorily equipped to meet these obligations. This may well take several years to accomplish, assuming that in the meantime there is no modification of the law.

It may, however, well be questioned whether, after this service has been substantially rendered, there may not properly be a somewhat rigorous delimitation of the work in psychology and education at the State college such as will prevent the development there of more than that amount of work requisite to meet the requirements of the State law for first-class certificates. It is the understanding of the commission that such a policy is, as stated above, avowedly that of the present administration at the State College of Agriculture and Mechanic Arts. It is, however, equally obvious that, unless some rigid supervision is exercised, the history of other institutions will be repeated and this work will little by little be allowed to grow until it has quite outstripped the original intentions of its founders. Certainly, with the exception of work in agriculture, the more advanced forms of training for teachers and especially for superintendents and supervisors who are to go into the higher branches of work in the State ought chiefly to be provided for at the State university. The facilities for such work are already fairly satisfactory there and can readily be developed into conditions of an entirely adequate kind with a smaller expenditure of time and money and among more congenial academic surroundings than elsewhere in the State.

Such development will require substantial expenditures, but they should unquestionably be made. There is decided need for a proper practice school at the university. As a makeshift the present arrangements may be accepted for a time, but they lack stability, and are imperfect in many essential particulars. The State can hardly justify a policy which involves doing poorly a thing that, if done at all, ought to be done supremely well. No informed person can doubt that this practice teaching work ought to be done, and it is to the interest of every community in the State that it be done in the best possible manner. If in this matter the State is to draw upon, or cooperate with, the school authorities of Iowa City or any other municipality, it should be under conditions that fully safeguard the larger interests of the State by assuring opportunities which both qualitatively and quantitatively are representative and adequate. Otherwise the State ought to rely wholly upon its own resources.

Replying more specifically to the inquiry of the State board of education, the commission feels that, as it has indicated above, a certain limited amount of work in education is justifiable at the State college of agriculture and mechanic arts. The obstacles at present encountered in the execution of any proposition to have teachers who are preparing to give instruction in agriculture take their agricultural work at the State college and their work in education at the State university or the State teachers college are of two main types, the one sentimental and capable of mastery, the other intrinsically educational and much more difficult to eliminate.

In view of the present attitude of mind among the students and the alumni of the State university and the State college of agriculture and mechanic arts, any discussion of migration between these two institutions may be dismissed as purely academic. Speaking broadly, no student will go from one to the other if he can possibly avoid it. Obviously this prejudice is intrinsically perverse and almost morbid, and with a more rational state of the public mind, could not for a moment be countenanced. It does, however, relate vitally to the actual facts in the present situation. Migration from Ames to Cedar Falls would encounter another type of sentimental prejudice, but one perhaps equally deep-seated. There is no material animosity between these two groups of students or between the alumni, but the students and graduates of the State college are not disposed to favor migration to the institution at Cedar Falls. However unjustifiable this attitude may be, it would at least make it difficult to induce students to go to the State teachers college in the necessary numbers to make a solution of the problem based on migration at all satisfactory. Moreover, there are difficulties on the side of inadequate accommodations at the State teachers college, commented upon elsewhere in this report (p. 55), which would render this proposal inadvisable without a very material enlargement of the staff and the plant at Cedar Falls.

The other difficulty concerns the fact that, in order to secure the best results in handling the courses in education, it is desirable that several of them should be given in chronological succession covering appreciable periods of time, so that the student may progress from the more elementary to the more advanced phases of the subject. If a student were to give his entire time for one year or even for one-half of a year to educational subjects alone, it would too largely compress the material and oblige the student to take parallel with one another courses which, to be handled most advantageously, should be given one after the other. Moreover, it is often highly desirable that the student should be carrying other subjects along with his work in education rather than be giving his time exclusively to that

opic. These considerations, while not constituting an insuperable obstacle to the proposition to have students migrate from Ames to Iowa City for their work in education, do create a very genuine difficulty which could hardly be altogether removed. Undoubtedly courses in education can be given occupying the entire time for half of a year or all of a year which students could pursue with advantage. But it would be distinctly less desirable than an equal amount of time in such courses spread over a longer total period; e. g., two or three years.

TABLE 6.—*Registrations in psychology and education courses, exclusive of summer sessions.*

Courses.	At the State university.				At the State college at Ames.			
	1912-13	1913-14	1914-15	Total.	1912-13	1913-14	1914-15	Total.
Psychology.....	279	326	408	1,013	271	242	366	879
Education.....	663	689	769	2,121	68	300	435	803
Total.....	942	1,015	1,177	3,134	339	542	801	1,682

SUMMARY OF RECOMMENDATIONS.

1. The imposition of no external limitation upon facilities offered at the three State institutions for giving work in home economics, agriculture, and manual training until the present force of teachers in the State schools is equipped to meet the obligations imposed by the State law.

2. Thereafter the delimitation of work in psychology and education at the State college to the amount requisite to meet the requirements of the first-class State certificate.

3. The provision of better practice facilities at the State university.

Chapter VIII.

HOME ECONOMICS IN THE THREE STATE EDUCATIONAL INSTITUTIONS.

The department of home economics at the Iowa State University was first organized in September, 1913. Its establishment resulted from a prevailing sentiment that all women should find it possible during their college or university years to secure such instruction in the household sciences and such training in the technique of household arts as will enable them to administer their own households efficiently and to care for the physical, mental, and moral well-being of the inmates thereof.

The Iowa State College of Agriculture and Mechanic Arts was a pioneer institution in the introduction of home economics courses into

college curricula, the first work in this subject having been offered in 1869. The authorities in control of the institution at that time considered the instruction of women in the arts and sciences related to homemaking as in harmony with the spirit of the Morrill Act. The Federal Government, through the Department of Agriculture, has since given recognition to home economics as a legitimate line of instruction in land-grant colleges.

The courses in home economics in the Iowa State Teachers College have been arranged to meet the need in the State for teachers of these subjects in rural and elementary schools. The importance of this department in the Iowa State Teachers College has been greatly increased since the enactment into law of a requirement that domestic science be taught in all rural schools, which necessitates the equipment of 12,000 rural teachers with some knowledge of this subject.

Bearing in mind the reasons for the development of these various courses, the commission undertook to study the present status of home economics and to reach a conclusion as to the position it should occupy at each institution.

The department of home economics in the university is housed in one of the older buildings on the campus, but such alterations have been made as to convert this structure into an entirely sanitary, excellently lighted series of offices, classrooms, and laboratories. The equipment provided for teaching the various lines included under "foods," "dietetics," "clothing," and "textiles" is of most admirable type and so plentiful that no additional purchase of similar equipment will be needed for several years, even should the enrollment in the department be doubled. However, the consensus of opinion among home economics teachers is that household administration cannot be most effectively taught without a residence of some sort for use as a practice house. Since the department is otherwise so well equipped, it seems especially desirable that it should not be handicapped by the lack of this piece of apparatus. The initial expense is comparatively small and the cost of maintenance inconsiderable. Such expenditure is in the commission's judgment legitimate. The teaching force of the department is adequate and could easily care for an increase of 30 per cent in the number of students.

In view of reasons elsewhere set forth in this report, the commission considers it unwise to develop at the State university courses in home economics leading to degrees. The proper function of the department in the scheme of university instruction should be that of a service department. Because of both its practical and its cultural value, the continuance of home economics on this basis is amply justified in any institution frequented by women. That courses in the subject not only afford useful training in the arts and sciences involved in the maintenance of efficient homes, but that their

content tends to broaden and humanize the experience of women students is commonly recognized. A certain amount of duplication in the fundamental lines of home economics teaching between the university and the State college is naturally unavoidable, as in the case of English and mathematics and other subjects generally held to be indispensable in both liberal and technical curricula. Unwarranted duplication can be prevented if the university department is kept from expanding beyond the limits of a service department.

Having regard to the definite differentiation of the university department from the department at the State college, where home economics constitutes one of the major lines of work, the development of courses for the training of high-school teachers of home economics should not be encouraged at the university. But there is another field which the university department, as it expands, may enter legitimately and consistently with the principles here enunciated. It may contribute to the training of hospital dietitians. The conjunction at the university of a department of home economics with a hospital and a medical school of the first rank presents an unusual opportunity for the development of this type of instruction. Although the demand for trained women as prescribing dietitians is new, it will apparently soon be considerable. If the State desires to create such courses, they should be connected with the home economics department at the university. This is not to be understood, however, as implying a recognition of professional courses in home economics at the university.

The department of home economics, established in the Iowa State College of Agriculture and Mechanic Arts in 1869, was recognized as a separate division in 1913. This division includes not only the usual household economics subjects, but also the department of physical training for women. The arrangement is most admirable and fortunate in this particular institution, where practically all women students are enrolled in the home economics courses.

The division of home economics has overflowed the recently constructed fireproof building and now uses four rooms in the chemistry building. A new and adequate building is an approaching necessity and should be so constructed that a woman's gymnasium may be included in it.

The teaching of home economics in the State College of Agriculture and Mechanic Arts has followed well-defined lines. It has been planned primarily to train the college women to perform household tasks dexterously and to understand the scientific principles underlying these tasks, and it has prepared many women for teaching and directive positions. More recently there has been organized a strong technical course for women not desirous of receiving a college degree.

There are certain directions in which the division of home economics may be developed logically and consistently with the principles already emphasized in this report. The State board may appropriately encourage the enlargement at the State college of facilities for preparing women for various positions of responsibility in dormitories, tea rooms, hospitals, and cafeterias. To this end it seems desirable that the college cafeteria be placed under the charge of the home economics division, and as far as possible used as a practice place. The training of hospital dietitians, however, appears, in view of the considerations already mentioned, to be more fittingly the function of the university department of home economics in conjunction with the university hospital. The commission recommends that effective cooperation between the home economics division and the authorities in charge of women's dormitories be established. In addition to training high-school teachers of home economics, a task to which the State college is already committed, the institution may well respond to the growing demand for the preparation of teachers of this subject for trade and industrial schools.

The rooms set apart for instruction in home economics at the Iowa State teachers college are located in portions of three widely separated buildings and even in different parts of the city. One food laboratory is in an inconvenient basement room. In the two sewing rooms, which are on the second floor of an old building, the lighting is so poor that artificial illumination must be depended upon during most of the day. With the completion of the new building now under construction, the food laboratory conditions will be somewhat improved. In other respects the housing of the department will still be very unsatisfactory. Two full years in home economics are offered in the degree courses and the diploma courses. In the rural teacher-training course the work covers two terms. In compliance with statutory provision a 12 weeks' course is also maintained.

There are certain fundamental weaknesses in the organization of the department of home economics at the Iowa State Teachers College which prevent the highest efficiency in teaching. The professor in charge of the work in the degree and diploma courses does not oversee either the instruction offered in the rural teacher-training course and in the practice school or the classwork in home economics at study centers held in different parts of the State. That a subject or group of related subjects should be taught in any one institution by three separate and noncooperative groups of teachers is a more regrettable condition than a possible overlapping of similar work in three widely separated institutions. Such lack of departmental coordination can hardly fail to lead to divergent methods of teaching and to unequal stress upon different phases of the subject.

Almost equally unfortunate is, in the commission's judgment, the use of home economics classes in the rural teacher-training courses as practice classes for home economics students in the diploma courses. Rural teachers are required by law to prepare themselves to teach domestic science. There is at least an implicit obligation laid upon the State to furnish at the State training school appropriate facilities for this preparation. In view also of the commanding importance of their future work, these rural teachers should not be subjected to experimentation during the all-too-brief period of their professional training.

As indicated in other parts of this report, teachers carrying 20 hours of college teaching a week with full classes should not be allowed to serve in study centers on Saturdays, unless this added burden is offset by release from some of their intramural work.

The commission recommends the reorganization of the work in home economics at the State teachers college through the appointment of one well-trained woman as head of the department, who shall have the direction of all the teaching in home economics subjects done on the campus, in near-by practice schools, and in the study centers maintained throughout the State. She should be paid a salary comparable with those paid to other department heads.¹

SUMMARY OF RECOMMENDATIONS.

1. The development at the Iowa State University of home economics as a service department along lines that will make it of greatest value to students majoring in other courses of study.
2. The avoidance by the university of courses that duplicate the work offered at the State College of Agriculture and Mechanic Arts in the preparation of high-school teachers.
3. The establishment at the university of special lines of work for the training of hospital dietitians.
4. The provision in the near future of enlarged accommodations for the department of home economics at the State College of Agriculture and Mechanic Arts.
5. The provision of opportunities for preparation in institutional and cafeterial management at the State college.
6. The provision of special courses for the preparation of trade and industrial school teachers at the State College of Agriculture.
7. The improvement of the accommodations provided for work in home economics at the Iowa State Teachers' College.
8. The reorganization of the work at the teachers college under a single head.

¹ The salaries at present paid to home economics teachers at the State teachers college are also too low to enable the institution to compete in the open market for the best teachers. For a comparison with those paid at Ames and Iowa City see appendix, pp. 166, 171, 183.

Chapter IX.

SUBCOLLEGIATE WORK.

In the light of facts presented elsewhere in the report, notably in Chapters II and III, the commission has ventured to make a somewhat careful study of subcollegiate work, and submits herewith its conclusions. Two of the three institutions visited by the commission carry on subcollegiate work on a more or less extensive scale.

At the Iowa State Teachers College, in 1914-15, the general normal diploma course showed 45 men and 219 women registered, and the rural normal diploma course 109 men and 482 women. These, including a few miscellaneous registrations, made a total in these courses of 865 students. The requirements for admission to the normal diploma courses are "on the basis of the rural school diploma" or the first-grade uniform county certificate; the instruction is confined mainly to the subjects required for securing a uniform county certificate or the normal diploma and second-grade State certificate. The need for some pedagogical training for all teachers in the rural and grade schools is urgent in every State in the Union. The public-school system in the State of Iowa needs annually some three thousand new teachers, many of whom will, as a matter of fact, enter their work without any school training in pedagogy. The effort on the part of the State teachers college to meet these demands by offering these subcollegiate courses is to be commended, as an essential part of the service of this great institution. In view of the fact that no other normal schools exist in the State, and the further fact that the training given in the normal courses in selected high schools is at best superficial and incidental to other purposes of the high schools, the commission believes that a still larger proportion of the energies of the State teachers college might profitably be devoted to the subcollegiate work, both in the regular session and in the summer session until such time as the State shall respond to the need for better training for all the teachers in its public schools and especially those in the rural schools. There is little danger that the development of this work, which is so directly accordant with the original purpose of the institution, will be overemphasized, or that it will bring the institution into unfair competition with the standard secondary schools. A distinct advantage of these courses, as given in the State teachers college, especially the vocational normal course and the rural teachers course, is found in the opportunity for practice teaching, for example in the demonstration rural schools maintained by the teachers college, under conditions approximating those which the student will afterwards meet in her independent teaching. But, although these courses meet an urgent present need, one which will

undoubtedly continue to be felt for some years, the State teachers college should, as soon as possible, extend its courses for the training of elementary school teachers, and should require high-school graduation for entrance to them.¹

The noncollegiate work at the Iowa State College is comparatively recent in its present form. The institution formerly combined secondary, vocational, and college work, but in 1910 it ceased to announce an academic curriculum enforcing the usual requirements of 15 units for admission. Beginning in 1911, it again announced an agricultural short course "of lower grade" than collegiate. "Noncollegiate work" as a title was resumed in 1912, and the college now spends about \$54,000 per year for this purpose. Since this is a special grant by an act of the legislature, it can not be said that the noncollegiate work is making direct drafts upon the regular income of the college. The fluctuation or experimentation in these noncollegiate and short courses is shown in its general features in the accompanying tabulation.

¹ See Chapter III, p. 55.

TABLE 7.—*Courses in the Iowa State College—Registration.*

Catalogue of—	Designation of courses.	Organization of short courses or noncollegiate.	Registration.			
			Year.	Academic or non-collegiate.	Short course.	Special.
1908-9	Academic.....	Certain students over 20 years of age admitted "without examination" if they had "satisfactory preparation." Two-year course in mining engineering; clay working; 1-year course in poultry husbandry.	1907-8	232.....		221.
1909-10	Academic; junior college, including academic, freshman, and sophomore classes.		1908-9	271.....		157.
1910-11	Junior college, including freshman and sophomore years.	Two-year course in mining engineering, clay working, and agriculture; 1-year course in poultry husbandry and dairying.	1909-10			75 unclassified, 119 in music.
1911-12	.....	Agricultural short course, "lower grade than collegiate"; 2-year course in clay working and agriculture; 1-year course in poultry husbandry and dairying.	1910-11		149	141 in music.
1912-13	Noncollegiate.....	Agricultural short course (noncollegiate); students must be 17 years of age and have completed eighth grade; 2-year course in agriculture; 1-year course in dairying; 1-year course in poultry husbandry; faculty—president and deans, 1 associate professor, 3 assistant professors, 13 instructors.	1911-12	188 in agriculture.....		
1913-14	do.....	Short course (same as in 1912-13); 2-year course in agriculture; 2-year home-maker's course; 2-year course in engineering (in trade-school work); 1-year course in poultry husbandry; 1-year course in dairying.	1912-13	218 in agriculture, 121 in music.....		19 in agriculture.
1914-15	do.....	Students must be 17 years of age and have completed eighth grade; 2-year course in agriculture; 2-year course in engineering (vocational course); 2-year course in home economics; 1-year course in dairying.	1913-14	275 in agriculture, 22 in engineering, 24 in home economics; total, 321.....		
1915-16	Noncollegiate (see 1914-15).	Faculty: President and deans, 4 professors, 3 associate professors, 4 assistant professors, 21 instructors, 1 assistant.	1914-15	249 in agriculture, 65 in engineering, 51 in home making; total, 365; 154 in music (of whom 92 are duplicates).....		14 in agriculture, 6 in engineering, 4 in home making, 9 in industry.

Noncollegiate work is now offered in the following "two-year courses or curricula: Agriculture; home economics; vocational courses in engineering for electrical workers and stationary engineers, mechanical draftsmen and mechanics, structural draftsmen and building superintendents, surveyors and road makers; and one-year course in dairying." For admission, a student must be at least 17 years of age and must present a certificate showing the completion of the eighth grade. High-school graduates, or students able to present 14 units, are not eligible to the noncollegiate course, with the exception of the one-year dairying course. Other students who have completed less than 14 units of acceptable high-school or academic work may secure some entrance credits, perhaps as many as 5 units of high-school work, through these noncollegiate courses, though the courses are not intended to prepare for the satisfaction of entrance requirements. One instructor reported that the majority of his students had had some high-school work, and a few almost four years of such work. This noncollegiate work should not be confused with the two-year college course in agriculture, for entrance to which students must present the same requirements as for the four-year collegiate course. As will be noted in the table, the enrollment for 1914-15 showed 249 noncollegiate students in the division of agriculture, 65 in engineering, 51 in home economics, 154 in industrial science (chiefly local students taking music).¹ The total of noncollegiate students, therefore, excluding music students, is about 365.

Instruction for noncollegiate students is given by 32 departments, corresponding approximately to those of the regular collegiate divisions. They include mechanical engineering, structure design, veterinary medicine, psychology, and bacteriology, as well as the agricultural subjects. Much of the instruction is given in the same laboratories, and in a very few cases by the same instructors as in the college proper. The faculty of the noncollegiate section consists of the president, the deans of agriculture, engineering, home economics, industrial science, and veterinary medicine, and 4 professors, 3 associate professors, and 4 assistant professors doing noncollegiate work. Besides these there are 21 instructors, 5 of whom appear to have no college degrees. With regard to the character of the instruction offered, an instructor in animal husbandry, for example, said that he gave to noncollegiate students substantially the same lecture and laboratory work as were given to collegiate students, but gave it more slowly. It was his judgment that most of the students in his classes could do the college work. While the noncollegiate teaching staff is kept fairly well separated from that of the college proper, the 365 noncollegiate students create as real a pressure upon the space

¹ Music is listed as one of the subjects in the division of industrial science; see p. 70.

and facilities of the institution as would approximately the same number of collegiate students. In a statement to the commission, the president of the institution declared that the college needed a building for the work of the noncollegiate section and that it ought to develop that work in engineering and home economics, as well as agriculture, though he said that the State had not thus far responded to the arguments for this development.

The commission is not much impressed by the arguments urged for the existence and development of this noncollegiate work by the State college. These are, in brief, that the college has to give it; that it thus takes care of "fine young men and women, not graduated from the high school, who have finished the eighth grade but want a little intensive, practical instruction"; that these students should have the same chance as other students, though they are not prepared for the college work, which is the main work of the institution. All these arguments could be urged about as strongly for other and perhaps lower grades of instruction by the college. The students who are ill-prepared for the regular work of the institution will probably always be a problem. Granting that the obligation to care for these students is laid upon the State, it does not follow that the work should be undertaken by an institution of collegiate standing as an appendix, or distraction. The State has once decided wisely, as the commission believes, not to mix secondary, collegiate, graduate, and research work at the State college. The commission therefore recommends that the State college give up for a second time all noncollegiate instruction (except limited short courses in winter or in summer for special groups of students), and give it up at the earliest possible date. This date should be announced in advance, so that adequate provision could be made by the State for the groups of students now represented in the noncollegiate courses. The State college would thus be free to discharge still better the large and increasingly heavy obligations which will inevitably tax to the limit all the resources the State will put at its disposal as a college of agriculture and mechanic arts. The commission is convinced that in the long run the money devoted to noncollegiate instruction will be practically a deduction from the total revenues that will be devoted to the institution by the legislature. In this conviction the commission is supported by the statement of so distinguished an authority as Dean Eugene Davenport, of the college of agriculture of the University of Illinois, who writes:

Even though special funds may at first be provided for the handling of such a group of students in an institution doing collegiate work, yet the time is bound to come, as the numbers increase and as the demands upon the institution multiply, when this group of students thus introduced will result in definite subtraction from the work which an institution may do of a strictly collegiate grade whether we are to regard the space required, the teaching power of the faculty, or the funds which may be provided for the institution.

Much more elaborate provision than at present needs to be made for the class of students now cared for by the noncollegiate courses of the State college. Furthermore, these provisions should be distributed about the State rather than centralized as a side issue or in the proper work of the State college. The field should be inoculated at many points, not at one only. The State is already subsidizing high schools to undertake special forms of secondary work, such as agriculture, home economics, and normal training. Instead of creating separate agricultural schools the commission urges the subsidizing of strong, progressive, strategically located high schools, which shall develop special vocationalized courses for the class of students under consideration. The State may well go to the extent of providing special local buildings (perhaps including dormitories) and farm tracts for the schools in question. Courses in these schools should not be those of the ordinary high school, but should be courses particularly adapted for the students who would not, under the usual conditions, return to the high school. The commission recommends that all work of this character should be under the general supervision of the State college. To put it in other words, this group of strong high schools, whether consolidated, or county, or union high schools, would perform for several thousand students the services which the State college now performs for a few hundred, many centers of impulse would take the place of one, and the directive, inspiring leadership of the State college would operate widely through permanent schools linked closely with many rural communities as well as through occasional extension groups.

SUMMARY OF RECOMMENDATIONS.

1. The continuance of subcollegiate work at the State teachers college.
2. As soon as other provision can be made, the abandonment by the State college of agriculture and mechanic arts of all noncollegiate work, except for limited short courses, in winter or in summer, for special groups of students.

Chapter X.

COURSES IN JOURNALISM.

The commission has investigated the matter of journalism, which was referred to in the memorandum submitted by the State board. It finds that some courses in journalism are offered at both the State university and the State college, but that there is, at present, no endeavor at either place to establish a school, or college, of journalism. As will appear in the following paragraphs, the commission

does not regard the establishment of such a school or college as at present desirable.

The work at the Iowa State University is confined to one 3-hour course running through the year, offered in the department of English. It is given under the title "The Newspaper," and discusses the principles and practice of journalism. It consists of lectures, the writing of "newspaper stories," articles, etc., with laboratory or practice work done upon the college paper, "The Daily Iowan," which is under the exclusive editorial direction of the instructor in this course. The establishment of this course, and its relation to the university paper, which is in reality a purely private enterprise, absolutely owned by one or two men, have a twofold purpose: First, to give some general instruction in the elements of news writing for students looking toward newspaper work as a profession; second, to secure the control of the college daily, whose conduct some of the faculty had looked upon as not creditable to the university. This control was so desirable, in the judgment of the department of English and the university authorities, as to warrant the payment of a salary of \$1,900 to the instructor, who gives only the one 3-hour course in the department, and devotes the rest of his time to the editing of the college paper and to publicity work for the university. Granting that the instructor appointed to the place is unusually capable and experienced, it is still a question whether it was wise to make such an outright addition to the budget of the department of English, which is already strained to meet the demands of undergraduate instruction, and which has scarcely begun to develop graduate work. The editorial and reportorial work on the college paper is conducted by the instructor and the members of his class; the advertising and financial part of the business of the paper is controlled entirely by the owners. Twenty-three students are taking the course in 1915-16. The student body of the university is said to be satisfied with the present arrangement for conducting the university paper, an arrangement which was characterized by a member of the faculty as "not a system, but a man."

This course does not commit the university to any formal development of a curriculum in journalism, leading to a degree, though such may be the outcome of this beginning. Probably another year will see an additional course offered, under substantially the same conditions. The university authorities have not been convinced, however, that there is a strong demand for college-trained journalists. This opinion was more or less confirmed by the responses received by the commission to a questionnaire sent out to all the publishers of periodicals in the State. The publishers were asked to state how many persons were employed in their editorial and business departments, excluding compositors, etc., how many of these were college

graduates, how many were graduates of institutions in Iowa, and, lastly, whether there was, in their judgment, a large and growing demand for college-trained men, comparable to the growing demand for men similarly trained for the professions of law and engineering.¹ Replies were received from 320 newspapers or periodicals. Of these, 200 replied to the last question in the affirmative, but only 49 supported their answers with any comment or argument; 94 answered in the negative; of these, 27 added comment; 20 failed to answer the last question, and 6 were noncommittal. The larger newspapers of the State were about evenly divided in their opinions as to the demand for college-trained men. The same is true also of the special journals like those dealing with agricultural matters.

The work in journalism at the State college is announced under the somewhat inapt title of "agricultural journalism." It is in reality a group of brief courses in technical journalism, under the direction of a professor who gives part of his time, an assistant professor, and student assistants. Nine courses are offered, involving a total of 15 hours. There are three general courses of one hour each, and three groups of two-hour courses dealing with the special application of journalistic practice to agriculture, engineering, and home economics, and three separate two-hour practice courses corresponding to each of these divisions. Two courses, in "Newspaper management" and "Management of a technical journal," one hour each, are given in connection with the actual making of the "Iowa Agriculturist." They follow the two-hour courses in "Beginning Technical Journalism." The department of agricultural journalism now includes also home economics journalism (since 1911) and engineering journalism. The department was established in 1905 through the grant of \$1,000 annually by Mr. John Clay, of Chicago, whose subsidy has continued to the present time.

The commission commends the form of instruction attempted here, since it gives a sensibly limited opportunity to students to acquire facility in writing technical paragraphs and articles for specialized periodicals. Any considerable enlargement of the present offerings of the department would, in the judgment of the commission, be open to objection.

SUMMARY OF RECOMMENDATIONS.

The approval of the work in journalism now offered at the Iowa State University and the Iowa State College of Agriculture and Mechanic Arts and the limitation of it to approximately its present scope.

¹For this letter see Appendix, p. 155.

Chapter XI.

COURSES IN COMMERCE OR A SCHOOL OF COMMERCE.

The State University of Iowa has for a good many years had strong courses in political economy, political science, and sociology, and for a time announced these as a school of political and social science and commerce. Its aim was stated to be: "To give a complete general view of all the political and social sciences, to foster their development, to assist in preparation for the various forms of public and social service, and to provide training for the wider avenues of business." In its faculty were included professors of history, law, and medicine.

In 1915 an effort was made to secure from the legislature a special appropriation for a school of commerce, which was to supplement, even to supplant, the organization just mentioned. In support of this proposal to develop a separate school or college of commerce, a brief was submitted to the legislative committee. This document, which the commission has before it, may be taken as the strongest presentation which could be made in favor of the proposed school of commerce. As a proof that there is an unmistakable demand for college graduates trained for business, social, and public service, it is asserted that one-fourth of the living male graduates of the college of liberal arts of the university are engaged in business, and that the percentage increases with each graduating class. According to the estimate of the registrar, 50 per cent of the men in this college will go into business. In the departments of this college the university had 1,200 registrations. The large number of letters received by the university commending the efforts of the extension division to serve the business interests of the State, which call upon the university for graduates competent to fill business, governmental, and social-service positions, and the demand for teachers of commercial subjects are likewise adduced in support of the proposal to erect a school of commerce. The brief cites the success and popularity of schools of commerce in such institutions as Harvard, Pennsylvania, New York, Illinois, Northwestern, and Chicago. It points out the increasing recognition of the fact that business men, like lawyers and engineers, must be thoroughly grounded in the principles underlying their work and instructed in the most up-to-date organizational practices. Attention is also called to the importance of furnishing those who would enter the industrial and social fields of the State with as good an equipment for service as is offered to those who would develop agricultural interests. For the support of this proposed school a considerable sum of money was asked, which should be comparable with the annual budgets of similar schools at the University of Illinois (about \$34,000) and at Northwestern University (about \$57,000).

The commission points out in this connection that the school or college of commerce in such institutions as Harvard and Illinois includes in its organization the department of economics, which is quite as much a service department for all the liberal arts curricula as it is a technical department for the college of commerce.

While the legislature did not make the appropriation asked for, the university appointed a new man to the professorship of political economy, sociology, and commerce, to take up most of the work relinquished by Prof. Loos, and to develop it with especial reference to the demands just mentioned. The commission has examined a schedule of the proposed courses for 1916-17, which indicates the desires of the department under its present leadership and the direction in which it would like to develop. A part of such a plan of development would be the addition of at least one full-time man for 1916-17 to take the place of a part-time man, to conduct theoretical courses, and the addition of two or three men in 1917-18 for the elaboration of courses in salesmanship, advertising, accountancy, commercial teaching, and the like. The total number of registrations for 1914-15 was 722, representing 475 persons. The corresponding figures for 1915-16 (November) were 860 and 560.

Before undertaking to formulate an opinion, the commission has also consulted persons outside the university and outside the State college who are intimately acquainted with conditions in Iowa. It appears to the commission that there is not a close parallel between the obligation of the university and that of such institutions as Harvard University, New York University, Northwestern University, and the University of Illinois, all of which draw very large numbers of students from great urban communities. Iowa is essentially a State devoted to agriculture and retail business, with many cities of medium size, but no great cities having highly complex business organization and continent-wide or international relations. While the commercial and industrial development of the State will perhaps go on rapidly, the probability of a sharp intensification of the demand for men trained in narrowly specialized courses in commerce is not very convincing as an argument for elaborate specialization in the curriculum of the university.

If a college or school of commerce were to be developed in Iowa, it obviously would belong in the university, where it would receive the best form of reenforcement in the allied subjects of history, political science, mathematics, modern languages, and psychology. The commission, however, is unconvinced that the university or the State would be warranted at the present time in proceeding to create and develop a separate college or school of commerce in the university and recommends that the present movement be confined to a moderate expansion and better correlation of the courses now offered

in different departments of the university, which would furnish the sort of training and develop the sort of interest which a progressive and ambitious business man should have. The three curricula proposed by the department—"Business course," "Secretarial course," and "Commercial teachers' course"—each leading to the degree of bachelor of arts in commerce, appear to be not much more than a broad liberal arts course, with a major in economics somewhat expanded. A college built upon this model would be a single-department college, most of whose work would be done in other colleges and departments. If accounting and economics were separated, it would make two departments at most. In the outline of "proposed courses" for 1916-17, the instructor in accounting is put down for 12 courses totaling 28 hours, and running into such refinements of the subject as "accounting for pharmacists." Under the heading of "Economics and business" are announced also courses in "immigration," "social statistics," "vital statistics," "business English," and "principles of persuasion and conviction." There is undoubtedly a tendency among the universities of the country to extend quite considerably those courses specially designed to interest students who are to go into business. Some persons even go so far as to claim that curricula for this purpose should be designed so as to make them quite as professional as courses in engineering, law, or medicine. The time may come when these curricula composed of courses in close sequence, leading to the preparation of technical experts in business, will be developed, but such curricula would be rather in the nature of graduate courses like those offered at Harvard University and Dartmouth College, than undergraduate courses made up in large part of courses in liberal arts and sciences.

Many advocates of improved training for engineers have, in recent years, swung away from the highly technical prescribed curricula toward a curriculum containing a larger amount of liberalizing material, or perhaps even to the requirement of one or two years of liberal arts and science work as the preparation for technological or engineering work, in the same way that one year of liberal arts work—sometimes two—is prescribed for admission to a standard medical or law school. When preparation for business is ordained in a similar manner upon a professional basis, it will be important to create a separate college organization and to back it with liberal funds for men and equipment. The expense of such a college will be great, owing to the fact that the university, in making appointments to its teaching staff, will have to compete in the business market for men of special talent and success. Twelve thousand dollars, which has been suggested as the sum that could be better put into business courses than anywhere else in the university, would be little more than a respectable beginning. Such men will be in great de-

and will command salaries, as a rule, quite beyond the ordinary university salary. If the university is to develop a college of commerce for the training of leaders and experts in business organization and enterprise, it can not afford to man its departments with mediocre men. The best men must be paid high salaries, salaries determined by the commercial or industrial market, and not by the educational market alone. In the long run, however, it will be economical to secure such men.

The commission urges one other reason for caution in the development of a distinct collegiate organization in commerce and business. The business and commercial interests of the State must demonstrate a permanent and cumulative demand for men who have had a professional or semiprofessional business training, similar to the demand recently generated among the agricultural interests, before the university will be warranted in proceeding beyond a strong departmental organization in economics, accounting, and commerce. When such a demand is demonstrated, and a commanding group of experts has been gathered together in the university, efficient service may be rendered to the State through investigation of commercial and industrial problems and practices, through extension courses, and through short courses offered at the university itself.

SUMMARY OF RECOMMENDATIONS.

The moderate expansion and better correlation of courses now offered in various departments of the Iowa State University rather than the creation of a separate college of commerce.

Chapter XII.

STUDY OF THE USE OF BUILDINGS AT THE IOWA STATE INSTITUTIONS.

A considerable portion of the State board's memorandum related to the building policy of the State at the three institutions. It requested the investigators to consider this policy with care, to study thoroughly the use of building space at each of the institutions, and finally to give definite advice as to the erection of a new building at the State university to take care of the departments of botany and geology. The commission has gone into these questions as carefully as the time and the money allotted to the survey would permit and submits this statement, which it hopes may be of value to the institutional authorities not only in determining the building program for the next biennium, but also in future estimates of the use of space.

It should be noted that all percentages, ratios, and other analyses given in this chapter or in the appendix are absolutely dependent upon the accuracy and completeness of the information submitted by the authorities at the State university, the State teachers college, and the State college of agriculture and mechanic arts for their respective institutions. The original data from which these results have been obtained are on file in the office of the Bureau of Education at Washington. Every effort possible under the limitations of time and finance has been made to correct discrepancies in the data received and to verify all calculations that are part of this report.

In considering the effective use of the floor space of any educational institution certain fundamental facts must be kept in mind. It should be fully recognized and appreciated at the outset that the ideal of the engineer—full utilization of a plant's facilities, so that every foot of plant is productive, leads to production, or, as unproductive, serves to aid production—is not only impracticable, but in fact impossible as a standard of measurement for academic operations. Teaching is not production in the ordinary sense and is subject to many factors and variants not encountered in industry. Laboratory equipment, for instance, must necessarily be highly specialized for the work of its science, whether natural or applied, and beyond its employment by that science in the process of instruction (in turn governed by unique considerations of brain fatigue, working light, and like expediencies) such "plant machinery" must perforce lie idle. Further, the human factor is not an operating factor producing material goods, but is concerned with teaching or with research; either with the transference of the vital thought from the mind of the teacher to the mind of the scholar, or with pushing outward the boundaries of knowledge through research.

Largely owing, however, to the very fact that the product of academic institutions is difficult to measure quantitatively, avoidable wastes have crept in in certain places, unnoticed by the faculties absorbed in the carrying on of their teaching and research pursuits. The figures and analyses given here indicate some of these overlooked wastes at the Iowa State institutions.

This study involves only actual conditions that are definitely expressible in the form of the number of square feet of floor space, the number of students, or the number of hours. Theories of construction and of use are purposely avoided, except in so far as the facts are interpreted for the special benefit and at the special request of the building committee of the board of education.

The total floor space of any building used for industrial purposes is composed of productive and unproductive space. Owing to the possible ambiguity of these terms when applied to buildings used for academic purposes, the terms "instructional" and "accessory" will be used in this report. Teaching space is obviously instructional

space; all other space, so far as the present purpose is concerned, is accessory, or, in some exceptional cases, a "combination" of instructional and accessory elements. The combination space set forth in the tables is used for purposes peculiar to the method of instruction in the construction of the building. In industry, as already indicated, productive space is most valuable when so designed and utilized as to give maximum opportunity for production. Unproductive space is most valuable when the maximum amount of it effectively serves the ends of productive space.

Instructional space, as the term is employed here, means that space used for the primary function of the institution—teaching—and is distinguished by the presence of a student or group of students for purposes of instruction. Under this head fall—

1. *Classrooms*, or space suitable for recitations or lectures in any course, regardless of content, where working apparatus is not required.

2. *Laboratories*, or space having individual equipment so specialized to a particular purpose that each student is enabled to pursue his task irrespective, in general, of the progress of others in the room at the same time.

3. *Mixed space*, where existing in a few cases, is simply an inseparable combination of classroom and laboratory elements. It should not be confused with "combination" space, defined above as a mixture of instructional and accessory space. For instance, an equipped laboratory in which some spasmodic recitations may occur does not, for present purposes, lose its essential laboratory character by such use unless the authorities have plainly indicated on the floor plans or rosters that it is a mixed room.

Accessory space, although not used specifically for teaching purposes, is to a large degree essential to the plant because of the physical features of building construction and the needs of the administrative functions. Waste or efficient use may equally well occur in instructional or in accessory space. Accessory space is classified into—

1. *Administration*, which includes all offices; storage and supply rooms; repair shops, tool rooms, and janitors' rooms; official reception rooms; vaults; document rooms; power plants and substations; battery rooms; private research laboratories, when same are not for purposes of student instruction; and the like.

2. *Other accessory space*, which groups all space, both necessarily and unnecessarily accessory, not otherwise classified, such as museums, libraries, and reading rooms, exhibit and display rooms (when separate from teaching space); locker, dressing, and rest rooms; halls and corridors; stairs and elevator shafts; dead floors; space used by interests outside the institution proper (State highway commission

at Ames and Y. W. C. A. at Cedar Falls); lunch rooms and literary society rooms; and the like.

Two other definitions are necessary to an understanding of the facts presented below. Instructional space is further classified as—

1. *Scheduled space*, i. e., that for which the commission has received a statement of definite student capacities and definite hours of actual use for teaching purposes, and

2. *Unscheduled space*, i. e., that teaching space for which either the capacity, or the hours of use, or both, were not furnished in response to the request for such data.

Accessory space, of its own nature, is "unscheduled."

The purpose of the statement of these subdivisions is to narrow down the inquiry to a manageable scope which will focus all available facts on the particular question asked by the board of education, viz: "Is the space provided for classroom, laboratory, and office purposes being economically used?"

METHOD OF INVESTIGATION.

Ten principal buildings were selected at the State University, eight at the State Teachers College, and ten at the State College of Agriculture and Mechanic Arts for detailed study as most normal and typical of the respective institutions and most nearly comparable as between the institutions. The new chemistry building at Ames could not be considered because of its incomplete equipment.

The analysis of the facts gained from a study of these buildings was further concentrated on the "scheduled" teaching or instructional space, which, as defined above, is that space used regularly each week by a definite number of students at definite hours, and for which the occupancy and time ratios explained later may be calculated. The "unscheduled" instructional space and the accessory space may be compared as to relative quantity, but not as to whether utilization is effective. On the basis of such principles, the commission can not say, after an examination of the floor plans and a broad observation of the three institutions, that a certain office is or is not used effectively. It can only indicate, on the basis of the data obtained, how much the instructional space is used and how the three institutions compare, leaving the determination to the board of education and to the institution in question as to whether or not that quantity is or is not effective utilization. By reducing these comparisons to a percentage basis it is not intended to fix 100 per cent or any other standard of effective academic use; 100 per cent utilization is wholly impossible in any educational institution. The figures showing the proportions of scheduled to all instructional space, of scheduled to total, of instructional to total, and of accessory to total, at the three institutions on the same basis of classification, appear in the appended tables.

Two methods might have been employed—the method of averages and the composite method.¹ The method of averages used throughout this investigation to determine the facts is given here in full as applied to the average use of the classrooms at the State University of Iowa.

By the method of averages it is found that 49.53 per cent of the actual capacity of classrooms at the State University of Iowa is used 7.13 per cent of the time, or an average use of 18.39 per cent.

The relation of the capacity of each room to its theoretical maximum capacity, or the increased utilization which would result from changes in seating arrangements and the like, depend so largely upon the policy of the institution (and in the case of the laboratories, upon the content of courses) that they at once involve elements outside this report.

Explanation of the occupancy ratio "O."—The percentage of the classrooms' actual capacity actually occupied is given the title "Occupancy" (O). The occupancy (O) equals 49.53 per cent for the classrooms of the State university. The method of obtaining the ratio "O" is as follows:

The maximum occupancy for any room (the maximum number of students regularly in the room at any period of the week), plus the minimum occupancy, divided by 2, equals the average occupancy. The average occupancy, divided by the number of working units (capacity) of the classroom reported by the authorities, equals occupancy ratio "O" for the given room. To obtain the occupancy ratio "O" for the classrooms in any given building, obtain the sum of the occupancy ratio "O's" for all classrooms and divide by the number of classrooms regularly scheduled in such building; this equals the classroom "O" for the building. To obtain the occupancy ratio "O" for a group of buildings, the sum of the classroom "O" ratios for the buildings having scheduled classroom space, divided by the number of such buildings, equals the "O" of the plant's classrooms, or, in the case cited, 49.53 per cent.²

¹ By the Composite Method is meant—

(a) The assumption that all classrooms in a given building are as one classroom, all laboratories as one laboratory, etc.;

(b) The combination of the individual room occupancies, capacities, periods used, and periods in week (number of rooms multiplied by 44) to find the "O," "T," and "OT" for the composite classroom, laboratory, and mixed space; and

(c) The further combination of the class, laboratory, and mixed ratios to yield the "OT" ratio for the plant, which would be—

$$\frac{\text{Total occupancy} \times \text{total periods used}}{\text{Total capacity} \times \text{total periods in week (Number of rooms} \times 44)} = \text{"OT"}$$

In view of the fact that the method of averages better serves the purpose of this analysis, the composite method is, in the opinion of the Commission, one of purely mathematical interest. To avoid confusion, the elements just outlined are not developed further in this report.

² Together with each such calculation of occupancy as that given above should exist a note showing the area and the relation of capacity to area, or the number of square feet for each working unit.

“Plant,” wherever used here, means the buildings selected as listed in the tables. The following numerical example may serve to show the method still more clearly:

Example: Room 109, Liberal Arts Building (or any other room, X).

Area, 710 square feet.

Seats, 36=capacity.

Square feet for each unit equals area divided by number of seats = $\frac{710}{36} = 19.7$ square feet.

Maximum occupancy per period, 33.

Minimum occupancy per period, 7.

Average occupancy per period, 20.

“O” ratio for room, $\frac{20}{36} = 55.5$ per cent.

Adding the “O’s” of the 23 classrooms in the building and dividing by 23 gives the average classroom O of this building. Adding the average classroom O of all buildings under consideration and dividing by the total number of buildings having scheduled classroom space (7) equals the classroom O for the plant = 49.53 per cent.

Explanation of the time ratio “T.”—The percentage of the total scheduled time that classrooms are actually occupied is given the title “Time” (T). In the case just cited the time ratio (T) equals 37.13. The method of obtaining the ratio “T” is as follows:

For any single room the ratio “T” is obtained by dividing the number of periods per week that the room is regularly occupied by 44 (the total possible teaching periods per week).

For any given building the sum of the resulting percentages for all classrooms divided by the number of classrooms thus regularly scheduled in each building equals the classroom T for the building.

For the whole plant the sum of the T ratios for all buildings having scheduled classroom space divided by the number of such buildings equals the T of the plant’s classrooms, or, in the case cited, 37.13 per cent.

The method used for T is in general similar to that used for O, but a numerical example may serve to clarify the process:

Example: Room 109, Liberal Arts Building (or any other room, X).

Periods room is used, 18.

Periods in week (constant), 44.

T ratio for room equals $\frac{18}{44} = 40.9$ per cent.

Adding the T’s of the 23 classrooms in the building and dividing by 23 gives the average T of the classrooms of the buildings. Adding the average classroom T of all the buildings and dividing by the total number of buildings having scheduled classroom space (7) equals the classroom T for the plant, equals 37.13 per cent.

Explanation of the average use ratio “OT.”—The average use ratio (OT) may be defined as the product of the occupancy and time ratios; that is, the average use is made up of both factors, average occupancy and average time used.

The determination of the factor "OT"¹ (average use) for the classrooms at the State University of Iowa then becomes 49.53 per cent of space use (O) multiplied by 37.13 per cent of time use (T) = 8.39 per cent average classroom "use" for the plant (OT).

To give a single numerical example.

Example: Room 109, Liberal Arts Building (or any other room, X).

5.5 per cent (O) × 40.9 per cent (T) = 22.7 per cent (OT).

The same percentage of use may be calculated by this method:

$$\frac{\text{Average occupancy (20)} \times \text{periods used (18)}}{\text{Capacity (36)} \times \text{periods in week (44)}} = \frac{360}{1584} = 22.7 \text{ per cent (OT).}$$

Either of the methods just given applies only to computations for single room OT. To arrive at the plant's classroom OT, multiply the average classroom O for the plant (see explanation and example above) by the average classroom T for the plant, which equals 18.39 per cent, in the case of the State university.

The examples just given deal only with classrooms; the statements below, A, B, and C, include also laboratories and mixed space. The method used is, of course, the same.

A. STATE UNIVERSITY OF IOWA.

1. Instructional space is 39.757 per cent of the total space.

Scheduled space is 69.415 per cent of the instructional and 27.415 per cent of the total space.

By the method of averages—

(a) 49.53 per cent of the classroom's actual capacity is used 37.13 per cent of the time, or an average use of 18.39 per cent.

(b) 51.728 per cent of the laboratories' actual capacity is used 37.65 per cent of the time, or an average use of 19.47 per cent.

(c) 58.613 per cent of the mixed space capacity is used 37.103 per cent of the time, or an average use of 21.76 per cent.

Combining (a), (b), and (c),

(d) Of the plant's *total scheduled space* (classrooms plus laboratories plus mixed), 53.732 per cent of the capacity is used 36.852 per cent of the time, or *an average plant use of 19.815 per cent (OT)*.

Explanation: 53.732 per cent = Occupancy ratio (O) = the average of the "O" ratios of all buildings, each of which is an average of the "O" ratios of the class, laboratory, and mixed space (considered separately in (a) (b) (c) above) of that building, i. e., an average of the use percentages found by dividing the sum of each building's "O" by the number of buildings having an "O" ratio.

36.852 per cent = Time ratio (T) = the average of the T ratios of all buildings, as for O, just stated.

19.815 per cent = Average use ratio (OT) = 53.732 per cent × 36.852 per cent, which combines the factors of space and time to show an actual use of time-capacity of 19.815 per cent for the plant.

2. Accessory space is 54.732 per cent of the total space.

¹ It must not be assumed that the percentages given here can be compared in any way to 100 per cent. It is not known what an effective percentage for academic utilization of space is. Probably from 35 to 50 per cent would be as high as could be reasonably obtained under favorable conditions at present, and this percentage is a purely empirical one. As far as is known, only one study of this nature has been

B. IOWA STATE TEACHERS COLLEGE.

1. Instructional space is 44.876 per cent of the total space.

(a) Scheduled space is 87.248 per cent of the instructional and 39.154 per cent of the total space.

By the *method of averages*—

(a) 60.32 per cent of the classrooms' capacity is used 38.692 per cent of the time, or an average use of 23.34 per cent.

(b) 65.638 per cent of the laboratories' capacity is used 34.806 per cent of the time, or an average use of 22.83 per cent.

(c) 62.46 per cent of the mixed space capacity is used 39.878 per cent of the time, or an average use of 24.94 per cent.

(d) Of the plant's *total scheduled space*, 59.997 per cent of the capacity is used 39.868 per cent of the time, or an *average plant use of 23.93 per cent (OT)*.¹

2. Accessory space is 53.239 per cent of the total space.

C. IOWA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

1. Instructional space is 44.157 per cent of the total space.

(a) Scheduled space is 66.082 per cent of the instructional and 29.177 per cent of the total space.

By the *method of averages*—

(a) 46.757 per cent of the classrooms' capacity is used 41.72 per cent of the time, or an average use of 19.508 per cent.

(b) 58.541 per cent of the laboratories' capacity is used 56.25 per cent of the time, or an average use of 32.928 per cent.

(c) 50.512 per cent of the mixed space capacity is used 45.65 per cent of the time, or an average use of 23.057 per cent.

(d) Of the plant's total scheduled space, 53.642 per cent of the capacity is used 49.299 per cent of the time, or an *average plant use of 26.444 per cent (OT)*.¹

2. Accessory space is 49.8 per cent of the total space.

RESULTS AND CONCLUSIONS.

Reference to the tables in the appendix will disclose many detailed comparisons which should be valuable to all concerned with the problem of effective utilization. The subject is too great for more than a cursory outline of the salient points.

All the facts, condensed by the same process and brought to a common focus, indicate clearly that the State college at Ames is making the most use of its plant, comparatively, and that the State university, if it feels the pressure of congestion at any point, may find a solution of its difficulty in changes in the rostering of students.

The occupancy ratio, however, may reasonably be low in some cases because of physical limitations, in addition to student roster factors. The room capacity, especially in the older buildings, may be large (40), while a section of students may, by the settled and wise policy of a department or institution, be limited to 20 or less. The

made, and there the local conditions make a fair comparative basis impossible. The most that can be said is that the figures given here indicate the need of further careful study and collection year by year of data of this type.

¹ See note on p. 105.

Desired size of the section has much to do with the utilization indicated by the occupancy ratio. This matter deserves thorough consideration with a view to making needed alterations and fitting future buildings to actual needs, but it should be remembered that when space is used wholly or partially for advanced or research work, the "O" ratio will always be low.

For theoretical purposes it has been assumed throughout this analysis that there is no congestion until the plant is run full time, or 4 hours per week; "microscopic light" and like considerations which would argue against such full-time production are largely matters of individual conviction. Many of the laboratories at Columbia University are working on a full-day schedule and by artificial light until 10.30 at night, and there is no vital difference in the attitudes of the three Iowa educational centers and that of New York, if daylight is to be taken as the determinant of the use or idleness of a room.

As to the facts of the general comparison between the simple OT ratios, the State college at Ames leads in effectiveness of utilization. This is very probably the result of the work of its "efficiency committee." The officials at Ames are to be commended for the independent effort they have already made to know their plant.

The commission strongly urges that at each institution the data on rooms be filed in one place, under the charge of a single officer. The lack of system in this matter in certain institutions may be illustrated by the case of a member of the faculty of one of them who wanted a classroom at 8 o'clock Wednesday mornings, and having none under the immediate control of his department, was without the means of finding such a vacant room. No individual, office, or committee had on file a complete roster or tabular view of the plant. The latent possibilities were unknown.

There is, unfortunately, no other State or National survey of college buildings, so far as is known, on the same or any other comparable basis, that would furnish a norm with which to compare the present operations in Iowa. What the commission has done is to furnish material for the establishment of an "Iowa norm" and detail a method by which the building committee of the board of education may test the validity of claims made upon it by the several institutions.

LIBRARIES AT THE STATE UNIVERSITY AND STATE COLLEGE.

The commission is unanimous in its opinion that library facilities are badly needed at the State university and the State college (Ames), and that the necessary construction should precede any other pending plans for new buildings, especially at the State university.

THE STATE UNIVERSITY.

The statements made by Dean Wilcox and Acting Librarian Roberts, of the State university, in the 1914 Report of the State Board of Education, pages 71 and 84, respectively, were fully substantiated by the commission's personal observation of the library conditions and the data available on the subject. In the first place, the accessions are too highly decentralized to make the administration effective or the function of the department vital. The physical arrangement of the library proper, in the Natural Science Building, is to the disadvantage of officers, students, and faculty.

THE STATE COLLEGE.

The library problem is as pressing at the State college, and demands immediate consideration. With 2,000 square feet of corridor space in Central Hall partitioned off to accommodate overflow books, and cramped administrative space, there is real need for a library building large enough to house the present collections and make due allowance for the ever-growing literature on agriculture and allied subjects.

It is suggested that when permanent quarters are constructed at either institution the building be of the expansive unit type, rather than a *complete* building. It will then be possible to extend the stack space as the collections are increased, and to add later an auditorium section (in both institutions) if cost prohibits the inclusion of the auditorium in the original construction. The commission does not commit itself to the combination of library and auditorium as a permanent feature of construction.

THE PROPOSED BOTANY AND GEOLOGY BUILDING AT THE STATE UNIVERSITY.

The board has asked specifically for advice on the matter of placing the proposed new botany and geology building¹ next in order of construction. The commission has studied the question with all possible care and submits the following statement of facts and opinions, together with recommendations.

The Old Science Building, now occupied conjointly by the departments of botany and geology, is a nonfireproof structure. Since its construction in 1884 it has been little improved to meet modern teaching demands. If the commission's information is correct, the expectation of moving into other and more adequate quarters has inhibited requests for needed improvements in the past four or five years. Requests may have been made, but no record of them was

¹ The commission is aware that the plans for this building have been approved by the legislature, but it understands that until the construction is definitely ordered the State board is able to allow other building plans to take precedence of this.

obtainable. In this connection special attention is called to this pertinent excerpt from the appended tables:

TABLE 8.—*Space and occupancy of buildings at the State university.*

Factors of comparison.	Old Science Building.	Natural Science Building.	Whole plant.
1. Total area.....square feet..	21,227	68,881	.....
a. Instructional space.....do....	9,539	9,540	.....
(1) Per cent of total.....	44.9	13.8	39.75
b. Accessory space.....square feet..	10,750	48,369	.....
(1) Per cent of total.....	50.6	70.2	54.73
c. Combination space.....square feet..	938	10,972	.....
2. Scheduled space:			
a. Average ratios of use—			
Occupancy (O).....per cent..	47.08	42.658	53.732
Time (T).....do.....	34.304	54.166	36.852
OT.....do.....	16.155	23.143	19.815
b. Average area per working unit—			
Classrooms.....square feet..	23.150	14.650	22.076
Laboratories.....do.....	25.775	43.250	¹ 55.300
Mixed space.....do.....	36.800	34.500	² 46.080

¹ Cf. high unit for home economics and physics (appendix).

² Cf. high unit for home economics; both raise plant average above normal.

It will be noted that there is no apparent congestion in teaching space now used by the botany and geology departments, and that these departments do not seem to be making as good use of their physical facilities as the department of zoology by about 7 per cent average.

The primary consideration of this specific problem becomes, then, not one of teaching, but of museum space. It is granted that such valuable collections as are now in the possession of the departments of botany and geology should be safeguarded against destructive forces. But certain general conclusions with regard to museum space have the indorsement of all the authorities consulted by the commission:

1. The scheme of a complete museum is impossible without practically unlimited funds¹ and time.

2. A State university museum, where there are not large numbers of specialists in zoology, needs a basic type collection for the purposes of the general students; it is important in an agricultural college that a fairly full series of insects should be in a museum as well as representatives of groups of economic importance. A consideration of the arrangement of the zoology museums will show that the collections are too much spread out, with waste of space, according to the best modern practice; that is to say, as regards zoology,

¹ On the basis of the areas reported by Supt. Flisk, it is found that 42.1 per cent of the building, excluding corridors, is occupied by museums. According to the calculations of the commission, which include corridors and are based on later reports from the superintendent, 27.4 per cent of the building is used for museums. Neither percentage includes the attic storeroom for specimens. Cost to construct building, \$275,372.05; investment by State in the zoology museums (27.4 per cent), \$75,451.94 (space only).

it is not necessary for teaching purposes at the State university to display all the variations of a species. There is evidently no limit to the ambitious concept of a complete museum, nor is there limit to the resulting expense.

The exhibition of an abundance of specimens has unquestioned cultural value, provided geographical location and flow of population will give the exhibition "circulation" enough to warrant its cost. But such by-purpose is outside of the primary function of teaching and investigation. Highly specializing research students should go to centers of collection, such as Chicago, New York, or Naples, rather than expect all research material to be concentrated within their own State borders. The modern tendency is *not* to have such large collections for teaching purposes.¹

If the present departmental policy is to be continued, involving the present or prospective use of as much storage space as the museum itself occupies, and the conversion of the present auditorium into a "museum of the State of Iowa" when the new library-auditorium building is built, it is the commission's opinion that the zoology museum should be given either enormously larger grants from the State treasury or an immediate endowment. In this matter the commission has reenforced its own judgment with that of experts on general museum problems. Quite without reference to any specific conditions in Iowa, the opinions summarized above were received.

The Natural Science Building, as originally contemplated, was to house zoology, botany, and geology. This plan was later modified to include temporarily a library and auditorium. Over 15,654 square feet² would be released to botany and geology by the removal to a new building of the library (all rooms in the building now used for library purposes, 10,007 square feet) and the auditorium (not including stage, balcony, or the possible area to be gained by flooring the present balcony well, 5,647 square feet). With reasonable compression of the present zoology museums, as discussed above, there would be available what would seem to be ample space for at least botany or geology. It is scarcely correct to pronounce this space inadequate by comparison with the space now occupied by the department of zoology, for the departments of botany and geology would hardly ask a new building of their own to cost the State \$200,000 unless there was a serious lack of space where they were originally provided for.

Botany, geology, and zoology could all overlap in the use of class (recitation and lecture) rooms, possibly in some of the laboratories, but *not* in museums. More museum space, comparatively, will

¹ Ornithologists teach primarily from skins and not from stuffed specimens such as are abundantly found at Iowa City.

² Commission's figures; balcony and stage of auditorium not included.

is needed by zoology than by the other two departments, because of the greater bulk of the specimens, especially the vertebrates. Twenty mineral specimens will go into about the same space as 20 botanical specimens; 20 zoological specimens demand more.

The proper ratio of storage to display space should be more nearly *one* for storage to *three* for display, than one or two to one. Given 100 per cent museum and laboratory space that can not overlap in a building, it might be said, roughly, that the allotment should be 30 per cent to botany, 30 per cent to geology, and 40 per cent to zoology.

While the facts cited indicate that the present demands may be met by such arrangements as have been suggested, and while it is felt that library and auditorium are at present the most pressing needs, and that the readjustments here outlined would make possible a better accommodation of existing departments, nevertheless it should be pointed out that the university will undoubtedly soon need more than one new building, and that adequate provision for the departments of geology and botany should be included in future building plans.

If the Old Science Building will not yield to modernization by paint, illumination, and rearrangement, in order to accommodate satisfactorily the remaining department (if both botany and geology can not enter the Natural Science Building), the board is then faced only with the easier problem of erecting a simple fireproof structure for that single department.

Alterations will be necessary in the Natural Science Building before the new tenants can be properly housed, and the Old Science Building should be cleaned up, on general principles if for no other reason.

CONCLUSIONS.

In conclusion the commission submits the following considerations to the attention of the board as bearing on the building policy for the future:

1. At a State school no new building should be erected primarily to provide teaching space while suitable teaching space is available in any building on the campus, regardless of the name in which the cornerstone of that building was laid. It is evident that there can be no proprietary control by a department or an individual over space provided by the taxpayers for educational purposes. The principle of the most advantageous use of space for the good of the whole institution should prevail.

2. When a new building is erected, the tendency of any department to spread out over all available space (including some provided for future growth) is one which can be easily checked by the governing authorities. Later contraction or compression is always difficult.

3. Dormitories are not a part of the instructional plant proper, and wherever erected should be self-supporting or even profitable investments for the State. The commission is informed that other colleges are earning as much as 6 per cent net on such investments.

4. Further investigation may reveal a local tradition that work should be concentrated largely in forenoons or afternoons, the time ratio reflecting the extent of the idle time. Any such tradition should be made to justify itself under searching criticism, or be forthwith abandoned. This problem is worthy of especially careful consideration.

The conclusions of the commission are based on as complete a factual study of the problem as circumstances permitted.

In the course of this investigation the commission has become more and more convinced that "needs" can be determined by the several institutions only on the basis of definite surveys of existing facts. Therefore, as a final recommendation, it is urged that the roster committees of the institutions be stimulated by the board's requirement that all askings for buildings henceforth be accompanied by some definite survey of the situation which it is proposed to remedy by new construction, and that the increased or decreased effectiveness of use be brought to the attention of the State board periodically by means of reports similar to those outlined in this statement. A complete study of the possibilities of the present facilities is fully warranted by the large values at stake.

SUMMARY OF RECOMMENDATIONS.

1. At the State university:

a. The construction of a library and an auditorium as the greatest present need.

b. The accommodation of one or both of the departments of botany and geology in the space thus released in the Natural Science Building.

c. The remodeling of the Old Science Building and the construction of a simple fireproof building to house the remaining department and its important collection (in case only one is accommodated in the Natural Science Building). The definite inclusion in future building plans of provisions ultimately adequate for the departments of geology and botany.

2. At the State college:

a. The early construction of a library and an auditorium.

3. A definite survey of the effective use of present building facilities along lines suggested in this report.

[The following graphical representations of the relations of instructional and accessory space to the total space apply only to the selected buildings as stated. Such relations have no significance except to indicate the nature of the investment in each plant from the standpoint of effective utilization. Combination space is not included in these graphs.]

"OT" RATIOS.

1. AVERAGE USE OF CLASSROOMS.

100 per cent—Standard of measurement.

35 per cent.

Very high percentage of use—Arbitrary estimate.¹

18.39 per cent.

State University of Iowa.

23.34 per cent.

Iowa State Teachers College.

19.508 per cent.

Iowa State College of Agriculture and Mechanic Arts.

2. AVERAGE USE OF LABORATORIES.

19.315 per cent.

State University of Iowa.

22.83 per cent.

Iowa State Teachers College.

32.928 per cent.

Iowa State College of Agriculture and Mechanic Arts.

3. AVERAGE USE OF MIXED SPACE.

21.76 per cent.

State University of Iowa.

24.94 per cent.

Iowa State Teachers College.

23.057 per cent.

Iowa College of Agriculture and Mechanic Arts.

4. AVERAGE USE OF PLANT.

19.815 per cent.

State University of Iowa.

23.93 per cent.

Iowa State Teachers College.

28.424 per cent.

Iowa State College of Agriculture and Mechanic Arts.

RELATION OF INSTRUCTIONAL SPACE TO TOTAL SPACE.

39.757 per cent.

State University of Iowa.

44.876 per cent.

Iowa State Teachers College.

44.157 per cent.

Iowa State College of Agriculture and Mechanic Arts.

¹ See notes, page 105. No data available for accurate statement.

RELATION OF ACCESSORY SPACE TO TOTAL SPACE.

54.732 per cent.

State University of Iowa.

53.239 per cent.

Iowa State Teachers College.

49.8 per cent.

Iowa State College of Agriculture and Mechanic Arts.

Chapter XIII.

BUILDING COSTS.

In addition to the foregoing analysis of the use of buildings at the three State institutions, the commission has also undertaken a study of the square feet of floor space provided for each student and the cost thereof. It is hoped that the results of the study, taken in connection with those recorded in the preceding chapter, may help the authorities to estimate the extent of building operations which will be required to house adequately the educational work of the institutions as the enrollments increase. It should be emphasized, however, that this study represents a different aspect of the building problem from that just discussed. Quite different factors are used to obtain the results.

In listing buildings occupied for educational purposes, an attempt has been made to separate them roughly into two groups: "Buildings used in common," as library, gymnasium, heating plant, auditorium; and "buildings used as classrooms and laboratories." This division can be only approximate, as many buildings contain rooms of both classes. The total floor area of each building has been taken, including corridors, closets, stairs, etc. Dormitories and residences have been omitted. Where dormitories are provided by a State, it is only reasonable that the income from them should fully cover all maintenance, cost, repairs, and renewal of equipment and pay from 3 to 6 per cent income on the investment. The erection of dormitories must be based on a desire to provide adequate living accommodations for students and is entirely separate and distinct from the provision of educational buildings.

In determining the square feet of floor space provided per student, the estimated *average attendance* during the present college year, 1915-16, was taken. This average attendance has been calculated according to the method described in Chapter II. It will be apparent that in considering building accommodations we are only concerned with providing adequately for the average number actually on the campus at one time during the college year. Using these factors, the

Following summary tables have been compiled. It is to be noted that all buildings except dormitories and residences are included in this study, whereas the study of the utilization of space concerned only 10 buildings at the State university, 10 at the State College of Agriculture and Mechanic Arts, and 8 at the State Teachers College.

TABLE 9.—*Cost of buildings of Iowa State educational institutions—Enrollment.*

Items of comparison.	Cost of buildings.	Square feet of floor surface.	Cost per square foot of floor.	Cost per student.	Square feet of floor per student.	Average enrollment of students.
STATE UNIVERSITY OF IOWA.						
Buildings used in common.....	\$380,125	124,028	\$3.07	\$146	47.7	.....
Buildings used for classes and laboratories.....	1,512,859	494,351	3.06	582	190.0	.....
Total.....	1,892,984	618,379	3.06	728	237.7	.....
Students in 1915-16.....						2,600
IOWA STATE COLLEGE.						
Buildings used in common.....	435,962	131,323	3.32	167	50.5	.....
Buildings used for classes and laboratories.....	1,548,085	513,157	3.02	595	197.5	.....
Total.....	1,984,047	644,480	3.17	762	248.0	.....
Students in 1915-16.....						2,600
Farm buildings.....	45,700	57,390	.80	17	20.7	.....
IOWA STATE TEACHERS COLLEGE.						
Buildings used in common.....	388,000	150,712	2.58	222	86.0	.....
Buildings used for classes and laboratories.....	498,000	272,714	1.82	284	156.0	.....
Total.....	886,000	423,426	2.10	506	242.0	.....
Students in 1915-16.....						1,750

Cost per square foot of floor space in some of last buildings erected.

Teachers college:

Vocational building.....	\$2.72
Library.....	3.25

State college:

Chemistry building.....	2.80
Veterinary building.....	3.04

University:

Women's gymnasium.....	2.46
Physics building.....	3.48

Average cost per square foot floor..... 2.96

It will be seen that an average of 243 square feet of floor space is at present provided. The average cost of six of the large buildings recently erected is \$2.96 per square foot of floor space. This amounts to \$720 per student. Since a considerable quantity of furniture and equipment must be provided for each new building, this figure is probably 10 per cent too low; \$750 or \$800 per student can probably be taken as a safer estimate. Hence, if the present per capita allowance of space is to be maintained, it seems reasonable to anticipate

an expenditure for additional buildings of \$75,000 to \$80,000 for each 100 increase in the actual average attendance. With approximately \$2,000,000 worth of buildings in use at the university and at the State college, respectively, an increase in the utilization of the buildings of 10 per cent over the present practice would be the equivalent of \$200,000 worth of additional buildings at each place. Further, the State board must anticipate that from time to time some buildings will be advantageously replaced by more modern structures. Some of the principal considerations, then, which the commission believes that the State board should take into account in determining its building policy for the future are given in the following summary of recommendations.

SUMMARY OF RECOMMENDATIONS.

1. An annual allowance of 2 per cent of the cost of buildings for repairs and renewals of furniture.
2. The replacement of worn-out or antiquated buildings by modern structures of the same capacity.
3. The realization of the necessity of appropriating \$75,000 or \$80,000 worth of buildings to provide for every addition of 100 to the average attendance after the limit of the utilization of the present space has been reached.

Chapter XIV.

THE PHYSICAL EDUCATION OF WOMEN.

Although not specifically requested to do so, the commission has undertaken to examine the conditions under which physical training is administered to women at the State higher institutions. The matter was forced upon the attention of the members of the commission during the course of their visits and was regarded as of such intrinsic importance as to merit all the consideration which the commission was able to give it. As the result of the investigation the following brief statement is submitted, accompanied by a recommendation.

Physical education is now required of all women students, usually for two years of their course, in the State higher institutions of Iowa. In view of this requirement it is highly important that the facilities provided should be adequate, that the relation of the department of physical training to the administrative departments should be intimate, and that the authority delegated to the physical director should be well defined. Only in this way can the State be

absolved of its supreme obligations for the preservation and the rebuilding of the health of its women students.

The new gymnasium at the State university is an excellent, well-equipped, fireproof structure. Since all young women in the university are required to enroll in gymnasium classes, the commission commends the administrative organization which subordinates the gymnasium to the office of the dean of women. This is a particularly happy arrangement in view of the fact that the dean of women registers the women students and acts as course adviser for all freshmen and sophomore women.

While the gymnasium accommodations for women at the State college of agriculture and mechanic arts are limited and will soon be outgrown, the conditions are admirable in every respect and the administration excellent. It is somewhat unusual to find a department of physical education organized as a part of the division of home economics, but, since practically all women at that institution are enrolled in home economics courses, this arrangement makes possible an effective cooperation between the authorities charged with the mental and those responsible for the physical training of women students. It appears to work satisfactorily.

The gymnasium facilities for women at the Iowa State Teachers College are inadequate and the conditions surrounding the work in physical education unsatisfactory, especially with respect to the supply of shower baths and towels and the use of the swimming pool.

The commission recommends that a regular woman physician be employed at each of the three State institutions, whose duty it shall be to advise all women students as to the extent and type of physical training required of each and to exercise general supervision over the health of women students. It is, in the commission's judgment, an indefensible practice to intrust, either directly or by tacit consent, the administration of curative treatment of serious physical ailments to any but regularly trained physicians.

RECOMMENDATION.

The appointment of a regular woman physician at each of the three State institutions to supervise the physical training and the health of women students.

Chapter XV.

THE WORK AND REMUNERATION OF THE INSTRUCTIONAL STAFFS OF THE IOWA STATE INSTITUTIONS.

Highly significant of the standards and administrative efficiency of an educational institution are the amount and character of the work demanded of its instructors and the salaries they receive for their services. The commission has judged that a study of these matters should form a part of its investigations. The board of education, also, in its original invitation (mentioned in the first paragraph of the introduction) to the Commissioner of Education to undertake the survey, specifically raised the questions: Are the classes of proper size, considering economy and efficiency? And, considering the subjects taught, are the members of the instructional staff teaching the proper number of hours a week? In this chapter an attempt is made to answer these questions, to discuss various other matters closely related to them, and to formulate certain principles which it is hoped may be useful to the institutions in the future.

In any college or university the administration determines, through the courses of study adopted, the policy of the institution in regard to the average number of hours per week a student is to be under instruction in lecture, quiz, and laboratory. With this policy fixed, the administration faces the problem of providing an adequate amount of this instruction of the highest quality possible for all students entered.

Some conclusions as to what is an adequate amount of instruction from the point of view of the individual student are generally accepted:

(a) In lecture a professor may meet effectively as many as can comfortably hear and see him.

(b) In recitation or quiz, 30 in a section is probably the largest number than can be effectively handled, but the desirable maximum for classes of this type would be from 20 to 25.

(c) In laboratory work it is commonly agreed that one instructor should be provided for every 15 or 16 students.

Larger numbers in quiz or laboratory sections seriously curtail the attention accorded by the instructor to each individual student.

The number of lecture, laboratory, and quiz sections which one instructor can meet in a week will depend on the character of the work, whether it is elementary or advanced, whether it involves reading a large amount of written work, and whether it consists entirely of separate courses or includes two or three sections of the same course. It will also depend on the amount of outside reading, writing, and research which he is expected to do. In every case a certain

variable amount of administrative and committee work will be carried by the members of the faculty.

In the following paragraph some standards are suggested which may be used to test the loads of the members of the teaching staffs of various types of institutions and which may help administrative officers to remedy an uneven and inequitable distribution of the teaching burden. In this discussion the "student-clock-hour" of instruction is taken as the unit. The term may be defined thus: One student under instruction in lecture, quiz, or laboratory for at least 50 minutes net represents one student-clock-hour. For example, 20 students meeting four hours a week in recitation represent 80 student-clock-hours.¹

A study of any department at once makes it evident that no definite number of student-clock-hours can be fixed for each instructor, but an average for a department may be set up. In a university, or in an institution where research work is encouraged and expected, it seems reasonable to expect a department to carry, on the average, 250 student-clock-hours per instructor. In a distinctly undergraduate college, where research is limited and where little or no graduate work is conducted, a departmental average of 300 student-clock-hours per instructor may perhaps be taken as the reasonable norm. It must be noted also that, in an institution whose program is made up largely of laboratory work, the average number of student-clock-hours per instructor will be higher than in an institution whose program consists chiefly of nonlaboratory courses.

Concerning the quality of instruction, something may be inferred from the salaries paid. Colleges and universities of the first rank must employ well trained and experienced teachers, and must pay them salaries large enough to enable them to support a family modestly and to keep in touch with the progress in their several fields of learning through attendance on the national meetings of the scholars in those fields. The practice of the stronger institutions in this country indicates that the average salary for a department should be at least \$2,000 a year. In the judgment of the commission, this amount should be regarded for the time being as the reasonable minimum average in collegiate departments, especially in view of the recent remarkable advance in the quality of high-school instruction and in the remuneration which it commands. In departments that expect to retain men of distinction a higher salary must be paid.

¹ It should be emphasized that this is a different unit from the "credit hour" or "semester hour." Usually two or three hours of laboratory work are required as the equivalent of one hour recitation, where semester credit hours are considered. The "student-clock-hour" here used as the unit does not discount laboratory hours, but counts laboratory, lecture, and quiz exercises equally, hour for hour. A student in chemistry one hour in lecture, one hour in quiz, and four hours in laboratory in a week would be counted as receiving six student-clock-hours of instruction.

If the curriculum of an institution demands that each student shall be under instruction on the average for 20 hours a week in lecture, laboratory, and recitation, then for every 1,000 students 20,000 student-clock-hours of instruction must be provided by the administration. If instructors carry an average of 300 student-clock-hours each, 67 instructors will be required. It is also clear that, with a fixed sum for institutional maintenance, the best salaries can not be paid unless the average load of student-clock-hours closely approaches the desirable maximum. For instance, if an institution providing 20,000 student-clock-hours of instruction has \$134,000 to spend on teachers' salaries and employs 80 instructors instead of 67, the average load of student-clock-hours will be reduced, but so will the average salary.

Credit value of courses.—In general an instructor dealing with elementary or intermediate classes can do more effective work by teaching a few courses three, four, or five hours a week each than by teaching a greater number of courses of less credit value. While one and two-hour courses may be justified by special conditions, such courses should, as a rule, be discouraged as uneconomical of teachers' and students' time. The commission is of the opinion that an elementary course three, four, or five hours for one semester can be more profitably taught and studied than one of one or two hours for two semesters.

Size of classes.—Classes of five students or less can rarely be justified except in advanced work or in the graduate school. Courses enrolling 10 or less are expensive and should not be given unless the need is fully demonstrated. Many small classes indicate in some cases the lack of adequate study of curriculum or schedule by the administrative officers, and in others an undue effort by departments to serve the whims or the convenience of students in order to build up departmental enrollment. Large classes, on the other hand, unless they are lecture classes, usually entail inferior educational results. Classes of over 30 are at least open to question. Any considerable number of them generally shows a need for more instructors, or a poor distribution of students or instructors.

Below are summary tables showing for each of the three State institutions the average salary paid in each department; the average number of student-clock-hours carried by the instructors in each department; the average salary paid by the institution; the average number of student-clock-hours carried by each instructor; the average number of student-clock-hours carried by each student; the number of courses given respectively one, two, three, four, and five hours a week; the number of sections having from 1 to 5 students, 6 to 10 students, etc., and the ratio of each of these groups of courses to the total number of courses given at the institution.¹

¹ For detail tables from which these summaries have been compiled, see Appendix, p. 158.

TABLE 10.—Number, salaries, and work of full-time instructors in liberal arts and applied science in University of Iowa, 1914-15.

Departments.	Full-time instructors. ¹	Average salary.	Average student-clock-hours taught by instructors in department.		Increase in departmental salary budget, 1915-16.
			First semester.	Second semester.	
History.....	6	\$1,517	119	160	\$900
Chemistry.....	11½	1,430	178	130	300
Education.....	5½	2,300	200	200	15,780
English.....	12¼	1,995	243	237	6,100
Public speaking.....	2	1,325	241	230	450
Geology.....	4	1,900	486	501	1,000
German.....	7	1,683	391	329	1,450
Greek.....	1½	.....	71	125	.....
History.....	5	1,960	251	250	4,425
Latin.....	3	2,200	157	144	.....
Mathematics.....	7½	1,580	234	160	550
Philosophy and psychology.....	5	2,300	275	269	2,600
Physics.....	6	1,634	303	280	1,075
Economics and sociology.....	5¼	2,200	331	388	7,500
Political science.....	3½	1,690	296	356	1,850
Romance languages.....	4	1,625	442	361	3,000
Geology.....	8½	1,685	279	253	650
Home economics.....	3	2,133	376	328	4,000
Applied science.....	20½	1,800	220	171	.....
Total.....	119½	213,676	31,605	28,634	.....
Average.....	.....	1,790	264	240	.....

By a "full-time instructor" is meant an instructor giving his entire time to teaching. In the case of one giving part time to the State Experiment Station a proportional fraction of their time and salary was credited to teaching. Instructors teaching half time on a small salary and devoting the balance of their time to study are counted as one-half instructors.

The enrollment of students was approximately 1,665;¹ average student-clock-hours to the student, 19.

It will be noted that certain departments are manifestly overloaded and should be relieved. Other departments could carry a larger load without being overburdened.

Credit value of courses.—There were 30 sections having one hour per week, 185 sections with two hours, 82 sections with 3 hours, 30 sections with 4 hours, 15 sections with 5 hours, and 16 sections as arranged.

The commission thinks that better results could be obtained in introductory, elementary, and intermediate courses, with some saving of strength, by the reduction of the number of one-hour and two-hour classes. This might be done in many cases by offering three or four or five hour courses for one semester in place of one or two hour courses for two semesters.

Size of sections.			
	Students.		Students.
95 sections.....	1 to 5	43 sections.....	31 to 40
80 sections.....	6 to 10	15 sections.....	41 to 50
Per cent, 39.		9 sections.....	51 to 60
20 sections.....	11 to 20	4 sections.....	61 to 70
77 sections.....	21 to 30	1 section.....	71 to 80
Per cent, 44.		2 sections.....	81 to 90
		2 sections.....	110 to 130
		Per cent, 17.	

¹ The entire enrollment was not studied; for example, the dental school, the medical school, and others were omitted.

TABLE 11.—*Number, salaries, and work of full-time instructors in the State college of agriculture and mechanical arts.*

[The data below refer only to collegiate students and the courses offered for their instruction in the various departments.]

Departments.	Full-time instructors.	Average salary.	Average student-clock-hours taught by instructors in department.	
			First semester.	Second semester.
Agricultural editing.....	3½	\$1,980	99	188
Agricultural journalism.....	1½	1,730	189	252
Agricultural engineering.....	6½	1,590	495	455
Animal husbandry.....	7½	2,170	528	517
Bacteriology.....	2½	1,850	164	342
Botany.....	6½	1,490	423	349
Chemistry.....	24½	1,080	430	372
Civil engineering.....	8½	1,820	376	375
Dairy.....	4½	1,840	197	349
Economical science.....	3	2,030	310	168
Electrical engineering.....	4	1,875	144	150
English and literature.....	15	1,275	201	160
Home economics.....	15½	1,320	346	321
Farm crops.....	7½	1,630	387	320
Horticulture.....	5½	1,500	286	206
Mechanical engineering.....	15	1,475	426	430
Physics.....	9½	1,490	266	230
Zoology.....	7½	1,550	280	450
Mathematics.....	12	1,370	262	235
Public speaking.....	3	1,133	132	108
Forestry.....	2½	1,740	160	164
Geology and mineralogy.....	2½	2,380	87	91
History.....	2	1,725	95	308
Soils.....	3½	2,090	495	304
Modern languages.....	6	1,325	234	313
Music.....	2½	1,125	232	370
Psychology.....	2	2,250	278	211
Structural design.....	1	2,500	115	443
Veterinary medicine.....	9	2,065	302	226
Total.....	190	297,944	61,069	58,354
Average.....		1,565	322	306
Enrollment of collegiate students.....			2,522	2,497
Average student hours per student.....			24.2	23.3

Credit value of courses.

Credit hours per week.	Credit hours per week.
65 classes had..... 1	1 class had..... 3½
6 classes had..... 1½	28 classes had..... 4
17 classes had..... 1¾	7 classes had..... 4½
126 classes had..... 2	1 class had..... 4¾
11 classes had..... 2½	29 classes had..... 5
11 classes had..... 2¾	1 class had..... 5½
84 classes had..... 3	5 classes had..... 6
11 classes had..... 3½	

It seems to the commission that some reduction in the variety of hours' credit offered would be advisable and also a reduction of the number of one and two hour courses. It should be noted, however, that at this institution an unusually large per cent of the students' time is spent in the laboratory, where three hours' work is required for one hour of credit. This explains the fractional credits.

Size of sections.

	Students.		Students.
2 sections	1 to 5	21 sections	51 to 60
9 sections	6 to 10	9 sections	61 to 70
Per cent, 27.5.		5 sections	71 to 80
5 sections	11 to 20	5 sections	81 to 90
5 sections	21 to 30	1 section	91 to 100
Per cent, 56.6.		10 sections	Over 100
sections	31 to 40	Per cent, 15.9.	
sections	41 to 50		

It is to be noted that at the State college 136 to 144 semester hours' credit are required for graduation, as against 120 semester hours at the university, exclusive of physical training and military drill, and 120 at the State Teachers College, exclusive of physical training and work in literary societies. It will also be observed that each student at the State college carries about 24 student-clock-hours of instruction as against 19 or 20 at the other institutions.

TABLE 12.—*Number, salaries, and work of full-time instructors in Iowa State Teachers College, 1914-15.*

[The following data refer to the collegiate enrollment only, including all students in the two-year and four-year courses, entrance to which is based on a four-year high-school course.]

Departments.	Full-time instructors.	Average salary.	Average student-clock-hours taught by instructors in department.				Increase in departmental salary budget, 1915-16.
			Summer.	Fall.	Winter.	Spring.	
Education.....	7	\$1,871	650	535	527	485	.....
Teaching.....	12	1,233	327	143	148	229	\$1,920
English.....	7	1,714	354	361	393	366	.....
Latin.....	2	1,850	110	165	183	156	.....
German and French.....	2	1,700	258	335	328	233	.....
Mathematics.....	1	2,300	595	245	219	220	.....
Physics and chemistry.....	4	1,575	348	316	222	240	.....
Botany, agriculture, geology..	4	1,850	650	446	331	746	200
History.....	2	1,450	400	440	393	403	.....
Government.....	1	2,200	766	287	180	295	.....
Economics.....	1	1,800	467	321	436	366	100
Art.....	3	1,333	492	178	353	301	.....
Music.....	3	1,700	770	368	312	236	.....
Manual arts.....	2	1,800	254	182	280	356	.....
Home economics.....	3	1,166	305	243	298	238	200
Total.....	54	86,100	17,338	16,609	16,382	17,928	.....
Average per instructor.....		1,594	321	308	303	332	.....
Enrollment of collegiate students.....				906	949	946	.....
Average student hours per student.....				18.3	17.3	18.9	.....

The commission submits that these figures indicate a very uneven distribution of the teaching burden and an inadequate number of teachers. If a better distribution of the teaching burden could be secured by the administration, it would partly relieve the situation, but at least five or six additional instructors should have been employed in 1914-15 to carry the load of that year.

Credit value of courses.—Almost all classes meet five hours a week. While this is admirable in elementary work, especially in the work of the first two years, it seems desirable to the commission to provide shorter courses, say, of three hours, for juniors and seniors. This is in accord with the practice of most strong and progressive institutions. Such an arrangement would probably raise the standard of the upper-class work and at the same time give greater variety of election to upper-class students.

Size of sections.—The figures give the average number of sections of sizes indicated for the year 1914–15, exclusive of the summer term. Subcollegiate classes are not included.

15 sections	Students. 1 to 5	19 sections	Students. 31 to 40
33 sections	6 to 10	5 sections	41 to 50
Per cent, 30.		2 sections	51 to 60
50 sections	11 to 20	Per cent, 16.25.	
36 sections	21 to 30		
Per cent, 53.75.			

TABLE 13.—*Summary of the data concerning size of sections in the three State institutions.*

Sections at—	Number of students in section.									
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	80 and over.
University of Iowa.....	95	80	120	77	43	15	9	4	1	4
State college..	162	149	405	235	92	39	21	9	5	16
Teachers college.....	15	31	53	38	19	5	3			

Certain interesting facts bearing on the administration of the three institutions appear in the foregoing summary. During 1914–15, 532 classes were given in which 10 students or less were enrolled (university, 175; State college, 311; teachers college, 46). The commission recommends that the officers of the institutions make a careful study of each of these classes to determine which of them were justified and which could have been omitted or postponed without material loss. Indeed, the commission is of the opinion that the administration of each institution should annually give the question of small classes earnest consideration, and that, in view of the expense involved, the organization of such classes should only be sanctioned upon presentation of evidence that they meet a real need of a deserving group of students.

In 1914–15, 285 classes of more than 30 students each were given instruction (76 at the university, 182 at State college, 27 at teachers college). The commission also recommends a study of these classes

to determine which of them were lecture classes, and therefore probably of justifiable size, and which were quiz or recitation sections, too large for the most effective teaching. As to the latter the administration should inform itself whether reductions might be effected by a redistribution of the work among the present members of the teaching staff, or whether additional instructors are needed to prevent the overcrowding of sections. Certainly in all departments where the average number of student-hours is less than 250 or 300, quiz and recitation sections of over 30 could be avoided by the proper distribution of work.

SUMMARY OF RECOMMENDATIONS.

1. The establishment of \$2,000 as the average minimum salary for collegiate departments.
2. The reduction of the number of one and two hour courses, especially in elementary work and in the first half of the college course, at the State university and the State college.
3. The reduction of the number of small classes (10 or under) at all three institutions.
4. More even distribution of teaching loads, to reduce the number of large classes (30 or more) at all three institutions.
5. The employment of several additional instructors (the number to be determined by the number of student-clock-hours to be carried) at the State teachers college.
6. The provision of a greater number of courses of less than five hours a week (three-hour courses are suggested) at the State teachers college.

Chapter XVI.

OBSERVATIONS ON STATE AND INSTITUTIONAL ADMINISTRATION.

The commission has been much impressed with certain features of the general organization of educational control in Iowa. Some of these are discussed here, in the belief that not only the board, but the people of the State, may be interested in the observations and conclusions of a group of outsiders who have approached the study of the State's problems without local affiliations and without bias.

RELATIONS OF THE STATE SUPERINTENDENT OF PUBLIC INSTRUCTION AND THE STATE BOARD OF EDUCATION.

Allusion was made in Chapter I to the lack of coordination between the office of the State superintendent of public instruction and the State board of education, with reference to the inspection and ap-

proval of high schools. The legislation which has made the office of State superintendent wholly independent of the State board of education, together with the legislative action granting subsidies to certain high schools which comply with requirements administered through the office of the superintendent of public instruction, has made possible a disparity between the criteria of standardization as represented in the recommendations and requirements of the superintendent of public instruction on the one hand and the requirements of the institutions of higher learning on the other, especially as the latter are administered through the State board's high-school inspector and his assistants. The commission is of the opinion that, even if overt conflict of authority be avoided by the forbearance, good sense, and mutual consideration of the several parties concerned, it is unwise to have perpetuated a situation which contains the constant menace of friction, tending to stimulate controversial relations among the educational institutions of the State or among the official representatives of the different divisions of its educational system. Several remedies suggest themselves.

In a number of States—for example, California, Illinois, Michigan, Minnesota, and Wisconsin—the State superintendent of public instruction is *ex officio* a member of the governing board of the State university. The commission is aware of the objection to *ex officio* members of university boards, particularly when such members are political officials not otherwise connected with the educational system of the State.¹ This objection does not seem, however, to lie against the head of the State's common schools. On the contrary, the inclusion of the State superintendent in the membership of the board of education has the very tangible advantage of emphasizing the unity of the State's educational enterprise. At present the Iowa State board of education is organically cut off from the agencies in control of the public schools, except in so far as it chooses to seek their advice. This is a serious defect in the board's relationship to the interests which it is in part designed to serve. Moreover, it appears evident that the association of the office of superintendent of public instruction with the board in the direct management and control of the higher institutions would at once bring about an understanding by each agency of the plans and purposes of the other and would do away with any further possibility of conflict in the determination of high-school standards, a matter in which both are vitally concerned.

A still more radical alteration of the State's administrative machinery, but one which seems to the commission much more likely to result in the smooth operation of all its parts, would be the extension

¹ In several States the governor and other State officers are *ex officio* members of educational boards.

of the jurisdiction of the board of education to include the public elementary and high schools and the provision for the appointment of the superintendent of public instruction by the board. Several States in which educational administration has reached a high degree of efficiency—notably Massachusetts and New York—have substantially this form of control. While it may be argued that in these States the board is chiefly concerned with the lower schools, and that the State's higher educational enterprise is not nearly of such magnitude as in Iowa, this does not seem to constitute a valid objection. The construction of the Panama Canal was directed by a commission of seven members. In other words, from an administrative standpoint, the size of the undertaking is immaterial. It is the coordination of the powers and responsibilities of the administrative officials and their executive officers that is significant.

However, if neither of these changes in the constitution or functions of the board of education seems to the people of the State desirable, the commission calls attention to the devices which have been adopted in several States to secure harmony between the governing boards of State higher institutions and the department of public instruction in the matter of high-school inspection. One of the best conceived of these, and, as far as report has come to the commission, one of the most successful, is that in force in Ohio. Its principal features are as follows: The staff of high-school inspectors consists of eight persons, appointed by the superintendent of public instruction. Two of them are not connected with any college or university, two are from the faculty of the college of education of the State university, one each from the faculties of the normal colleges at Oxford and Athens, and one each from the faculties of the normal schools at Kent and Bowling Green. The various faculty representatives on the board of inspectors devote one half the year to inspection and the other half to teaching. The classification and rating of all schools is decided by a majority vote of all inspectors, meeting together under the chairmanship of the superintendent of public instruction. A copy of the report made on each school is furnished to the school itself, and one is sent to each of the institutions from which the half-time inspectors are chosen.

The systems in force in two other States may also be mentioned briefly. In Arkansas the high-school inspector is appointed by the State university and reports both to the university and the State department of education. The object of the inspection is threefold: To determine the granting of State aid, to organize and develop high schools, and to accredit schools equipped to prepare for college. In Florida the high-school inspection is under the joint control of the State university and the State department of education. The high-school inspector is the dean of the teachers' college of the

university and reports both to the university and to the department of education. The objects of the inspection are to stimulate the development of weak schools and to accredit schools equipped to prepare for college.

The commission has no right to offer recommendations on these matters, but it desires most earnestly to call them to the attention of the board, the legislature, and the people of the State.

A second subject, also outside of its legitimate field, on which the commission feels constrained to comment, is the constitution of the board of educational examiners. This board determines the qualifications of teachers for the State and issues certificates authorizing individuals to teach. It consists at present of the superintendent of public instruction, who acts as chairman, the president of the State university, the president of the State teachers college, and two persons appointed by the governor. It will be remarked that the president of the State college of agriculture and mechanic arts is not a member of this board. Since the State college is now the recognized training school for certain groups of teachers and is preparing annually such large bodies of young people for the teaching profession, it seems to the commission a matter both of courtesy and good judgment to include the president of that college in the membership of the board of educational examiners.

THE POWERS OF THE FINANCE COMMITTEE AND THE POSITION OF THE PRESIDENTS OF THE HIGHER INSTITUTIONS.

The commission is unanimously of the opinion that to go to the bottom of the difficulties confronting the State necessitates touching upon certain other and more intimate aspects of the organization of the State board of education.

The position of the finance committee seems to demand very thoughtful consideration. Unless the functions of this body are sharply defined and restricted, it appears to the commission highly probable that within a short time many of the responsibilities generally assigned to the executives of State institutions will largely pass into the hands of the committee. If it be desired that the presidents shall become purely *educational* administrative officers, with no responsibility whatever in fiscal affairs, this can perhaps be brought about. It would certainly constitute an interesting experiment in college and university administration—an experiment which most States would prefer to have made for them by some other State. Something of the sort has been more than once suggested. The commission does not, however, understand that this was the purpose of the act creating the committee. It is, nevertheless, clear that a committee of this kind, frequently on the grounds of each institution and

by reason of this fact more intimately informed regarding their internal conditions than perhaps any member of the board, partly in consequence thereof enjoying de facto (whatever the theory) large control over expenditures, is likely to acquire powers which it was never intended to convey. With the best of intentions such a committee will inevitably come under the influence of particular faculty individuals or parties, and the president's position may well become decidedly anomalous. It should be emphasized that the committee was everywhere spoken of with respect and appreciation, and the commission doubts whether abler and more efficient appointees could be chosen. But more than once indications appeared that the difficulties predicted had already in some instances begun to be realized. In some cases it seems that members of the faculties have been uncertain as to whether in seeking approval for proposed expenditures they ought properly to go to the president or to the finance committee. This uncertainty is of course capable of speedy correction. Its importance here is simply as an indication of the almost inevitable tendency of a body like the finance committee, consciously or otherwise, to acquire functions commonly restricted to the presidents.

To one unfamiliar with the actual internal workings of an American State university it may seem wholly practicable to divorce the educational supervision from all fiscal control, and as already indicated this has more than once been suggested. But to persons cognizant of the actual circumstances the practicability of this plan seems open to grave doubt. Not only must there be some one whose judgment in educational matters can be trusted when expenditures for wholly new enterprises are at issue; there must also be some authority who shall determine the thousand and one questions of *detail* in expenditure within the limits of a general budgetary program. For example, who shall determine whether, of \$2,000 available in general funds, the department of botany shall be allowed to purchase certain desired and perhaps essential additions to its equipment, or instead of this the department of history be permitted to make indispensable additions to its library? Only one can be done at a time. Questions of this kind under any budgetary system are constantly coming up in the larger institutions, and it seems somewhat obvious that an intelligent college president is more likely to reach a decision based on a just consideration of the educational issues involved than any layman, however well intentioned. Illustrations of the same type might be repeated indefinitely.

Now, again, it is not the understanding of the commission that in theory the finance committee forthwith decides this kind of thing, much less that it works in a manner designed to go behind the presidents, or undermine their authority with the faculties and students.

But, as was remarked above, there can be no question that increasingly as time goes on, the more intimate knowledge of the local situations possessed by the members of this committee, as compared with most of the members of the board, must operate to confer on the committee very large power and often a decisive influence. It will in the judgment of the commission inevitably occur that the board as a whole will get further and further away from the institutions, a result which would be highly regrettable. So long as the committee is equipped, as at present, with men of ability and single-minded devotion to the interests of the State, the practical consequences of the situation, so far as concerns the measures actually approved by the board, might be quite beyond criticism. With members of another kind the influence of the committee might be disastrous, and in any case, unless the powers of the committee are carefully defined so as to avoid all possibility of interference with the legitimate influence and authority of the several presidents, there is contained here the seed of serious consequences—among others the entire unwillingness of men of first-rate character and ability to serve the State in the presidential offices. High-grade character and ability always demand, and properly demand, actual power and real responsibility.

The commission finds it difficult to believe that the exclusion from the sittings of the board of education of the presidents of the State institutions of higher education (save on receipt of special invitation) can commend itself permanently as a wise policy. It is the unanimous opinion of the commission that the present procedure subjects the presidents of these institutions to conditions that are incompatible with the dignity of their office and likely to prove provocative of serious misconceptions in the State. From one point of view the presidents, like any of the other officers of these institutions, are simply employees of the State and more immediately of the board. In a larger and truer view of the case, however, they are expert officers of the State itself, responsible for perhaps the most important part of its internal administration, and, as such, every measure ought to be taken which will insure a dignified and complete presentation to the board of the issues affecting the several institutions in their charge. The commission questions most seriously both the propriety and the ultimate efficiency of a system which gives the institutions no official representation before the board, but it leaves it entirely to the initiative of the board to call them in when it sees fit. Such a procedure inevitably puts the administrative head of an institution in the position of a suppliant for favors instead of in the position of an authorized expert presenting to the responsible authorities the interests of the institution immediately in his charge.

Moreover, under present conditions it is difficult for the executives to view their problems as concerned solely with the best service of the State rather than with the upbuilding of particular institutions. If they were regular members of the State board, even though enjoying no vote, their outlook on the situation as a whole would necessarily be at once enlarged and altered and the board would unquestionably enjoy their loyal cooperation in meeting its problems. So far from complicating the transaction of the board's business, as might be feared by some, their joint presence would allay suspicion and create an atmosphere of frankness and fair dealing which could only be conducive to the welfare of the educational interests of the State. It is therefore recommended that the presidents of the State institutions of higher education be made *ex officio* members of the board of education without power to vote.

SUGGESTIONS REGARDING INTERNAL INSTITUTIONAL ADMINISTRATION.

The commission has been impressed with the possibility of improving certain features of the internal administration of the State institutions. Some of the present practices were no doubt satisfactory when the institutions were much smaller. Their inappropriateness to present conditions is perhaps more obvious to outsiders than to those within the institutions who have become more or less accustomed to the situation and have consequently come to accept it as natural.

At the State university the commission remarked in many ways the evident absence of a definite and consecutive policy in accordance with which the institution has been guided in recent years. This is no doubt in part due to the frequent changes in the presidency, with the consequent disorganization of plans. It is probably also due to the lack of active participation by the faculty as a whole in the formulation and execution of any program for the development of the institution. The university presents rather strongly to a visitor the impression of a group of relatively autonomous departments and colleges, many of them going their own way, with little obvious regard to the interests of other departments and even less for the institution as a whole. In default of a strong continuous centralized administrative control, such a condition tends to give the pushing, and even the selfish individual, an unfair advantage over his less aggressive and more generous-minded colleague. Needless to say, the institution is not always the gainer by the results of this situation. Furthermore, certain individuals may, under these circumstances, acquire essentially vested rights and privileges which it then becomes academic sacrilege to invade. The commission is disposed strongly to urge whatever measures will create or restore a

keener sense of faculty responsibility, with a corresponding decrease of departmental autonomy. The department should be the servant, not the master, of the university.

At the State teachers college a different form of administrative policy was encountered which also seemed open to betterment. There is no question here of the usurping by the departments of powers or privileges commonly vested in the executive or in the faculty. But as an incident of the highly centralized organization, there was observed a form of procedure, several times repeated, which perhaps attains a certain administrative efficiency at the cost of a genuine educational efficiency. For example, psychology is taught in the college ostensibly for its value in the science and art of teaching. The college courses in education are given for a similar reason. But the work of the practice school in which these subjects might be expected to find their application, illustration, and correction is conducted under an entirely separate administration and with only the most nominal and perfunctory coordination with the college department. The conditions of mutual understanding and cooperation between these two divisions of the institution, which the commission had been led to expect, proved on analysis of the facts to be of the most formal character. The disparity between the theory of the relationship and the actual fact appeared to be unequivocal. The commission is not unaware of the difficulties, both educational and administrative, involved in the conduct of a practice school and the proper correlation of its work with the academic work in education; nor is it oblivious to the obvious freedom from administrative friction which ensues from a policy of mutual exclusion such as is here represented. Unquestionably it makes for administrative quiet and peace. Also unquestionably it diminishes for the students by an amount not easily estimated, the actual significance of the work in teaching, in psychology, and in education. There is also perhaps an equally great loss in another direction, namely, in the vitalizing of the work of the members of the staff of the practice school which would follow from a more intimate contact with the work of the academic division.

A similar situation exists in the lack of coordination between the rural school division, giving work in education and psychology, and the college department. Here there is no necessary loss to the students, because they do not regularly come into contact with both divisions; but it is hard to believe that a system which keeps two such cognate divisions apart from one another can be realizing at all completely on its own intellectual resources.

Again, the organization of three essentially distinct divisions of work in home economics with separate laboratories, separate staff, separate purchasing arrangements, and the like, makes for

needless multiplication of supervisory duties, to say nothing of administrative wastage at other points.¹ In the new building presumably some of these objectionable features will be remedied. But the administrative principle under which such conditions can have arisen is the object of skepticism; and unless this is corrected, the same type of difficulty will certainly occur again. An administrative coordination represented by the nominal subserviency of cognate unrelated divisions of work to a central office or person outside the departments concerned may conceivably achieve desirable freedom from some forms of tension, but as represented in the instances cited at the teachers college, it is highly improbable that it could ever meet fully the genuine needs of the students for whom the institution is conducted.

Attention should also be called to the danger that the extension work now in operation at the teachers college may affect unfavorably the work done on the grounds, because of the fatigue and distraction of the staff represented. The work itself appears to be admirably conceived and thoroughly worthy of development; but unless some conditions are made to the faculty, or in some other way the school hours of the teachers engaged in this work are diminished, the result is certain—impaired health, impaired intellectual resiliency, and consequent loss of efficiency in the work of instruction at Cedar Falls. On the other hand, if relief of this kind is afforded, the work will bring back to the institution in the way of enrichment and vitalizing teaching all that it gives.

INTER-INSTITUTIONAL SENTIMENT AND ATHLETICS.

The commission has already several times referred to the unfortunate bitterness which characterizes the attitude of the partisans of each of the State institutions toward those of the others. The tendency to regard with suspicion acts of a sister institution, to impute unworthy motives to its officers and adherents—this is the principal cause of the State's educational woes. It is not an expression of generous rivalry or of wholesome competition. It represents rather a devastating blight fastened upon the whole educational system of the State. That all three of the institutions should have made such genuine progress and should have attained such commanding rank among the collegiate institutions of the country in an atmosphere so hostile to true educational advance is testimony of an amazing innate vitality. The fact indicates that fundamental organic weaknesses are lacking and that Iowa's difficulty is largely a state of mind.

The commission can not believe that the citizens of a strong and enlightened Commonwealth will much longer tolerate a situation in

¹ This question has already been discussed. See Chapter VIII.

which the most potent instruments for civic and intellectual betterment are thus blunted. It can not believe that the good sense of the State will longer permit petty institutional jealousies, founded for the most part on the merest illusions, to defeat even partially the State's educational purpose. It can not believe that the citizens of Iowa, even the most partisan minded, will much longer fail to see that the State's advantage is above the ambitions of any institution; that true institutional loyalty in any student or alumnus of a State institution means the consideration of the State's advantage first; that any student or alumnus who puts the claims of his institution above those of the State is an enemy alike to the State and to his institution.

While the commission is confident that this point of view must inevitably prevail—and it hopes speedily—nevertheless it recognizes the tenacity of existing animosities and the fact that exhortation will probably have slight effect upon them. It is led therefore to suggest one, as it believes, practical step toward the accomplishment of the desired end. This is the temporary discontinuance of intercollegiate football, and perhaps baseball, between the Iowa State University and the Iowa State College of Agriculture and Mechanic Arts.

The annual football game between the college and the university is the occasion of the revival of feuds, charges, and countercharges, the reassertion of differences and criticisms which at best have had only poor reasons for existence. The event, if the evidence is to be trusted, rarely partakes of the wholesome, generous, sportsmanlike rivalry which generally characterizes the relations between other universities in different States—for example, between Minnesota and Illinois. An enthusiastic, intelligent loyalty to an institution on the part of its alumni and friends is one of its strongest assets. Occasions which stir up such loyalty by bringing together large numbers of supporters of an institution like either of these, which is the creature and servant of the State, should be encouraged and supported, but occasions which engender misunderstandings and antipathies, with their consequent disintegrating and harmful effects, are to be avoided. That form of loyalty which finds its chief incentive and expression in hostility toward another creature and servant of the same State can not of itself and in the long run be a good thing for the State or its institutions.

For these reasons the commission recommends that intercollegiate football games at least, and perhaps baseball games also, between the two institutions under discussion should be completely suspended for a period of five or six years. This recommendation has nothing whatever to do with the larger matter of the participation of both institutions in other intercollegiate contests—for example, between

either of the institutions and the University of Nebraska or the University of Missouri or the Kansas State College. Games such as these ought to furnish the occasion for gatherings of enthusiastic and sportsmanlike alumni. They would, however, be devoid of the highly objectionable bitterness and institutional prejudices which seem to have contributed in recent years to obscure a sound and appreciative judgment of the merits of each institution by the adherents of the other.

The substitution of cooperation for competition is one of the largest and most outstanding needs in the adjustment of the relations of the two institutions. An earnest and progressive desire to cooperate by the alumni, faculty, and students of both the State college and the university should take the place of the traditional and oftentimes exaggerated rivalry which has hitherto characterized their relations in general. To magnify and perpetuate old antagonisms and fictitious differences under the guise of cultivating loyalty is to prevent the most efficient accomplishment of the State's purpose in creating these institutions.

CONCLUSION.

The commission has no desire to have its last word one of adverse criticism. In spite of the unwholesome effects of such interinstitutional sentiment as has been referred to in the preceding paragraphs, the commission would like to record its keen appreciation of the condition of the three State institutions. It considers that the State is to be congratulated upon the possession of higher schools on the whole so well conceived and well managed. It was especially impressed by the ability and devotion with which the members of the several instructional and official staffs are discharging their functions. An attitude of simplicity and straightforwardness prevails at all three institutions. The standards of all three are high and are conscientiously enforced. The high position of all three among similar institutions in the country is well known and unquestioned.

SUMMARY OF RECOMMENDATIONS.

1. The readjustment of the official relationships between the office of the State superintendent of public instruction and the State board of education.

2. The inclusion of the president of the State college of agriculture and mechanic arts in the membership of the board of educational examiners.

3. The strict definition of the powers and functions of the finance committee.

4. The inclusion of the presidents of the State higher institutions ex officio in the membership of the State board of education, without power to vote.

5. A larger measure of faculty responsibility and a decrease of departmental autonomy at the State university.

6. The closer correlation of cognate departments in the practice school and in the academic divisions of the State teachers college.

7. The temporary discontinuance of football (and perhaps baseball) games between the State university and the State college of agriculture and mechanic arts.

Chapter XVII.

GENERAL SUMMARY OF RECOMMENDATIONS.

DUPLICATION.

1. The adoption of the principle of "major and service lines of work" at the three State institutions.

2. The creation of an annual conference consisting of members of the faculties of the institutions and the State board of education, to adjust questions of overlapping not automatically determined, by the establishment of major lines for each institution.

3. The readjustment of the work in engineering at the State university and the State college, according to one of three methods:

(a) A horizontal division assigning graduate work to one school and undergraduate work to the other. (Judged at present impracticable by the commission.)

(b) The union of the two schools at one place. (Thought by the commission to be at present possibly inexpedient because of the state of public opinion.)

(c) A vertical division of work, assigning some branches of engineering to one institution and some to the other.

4. The discontinuance of the last two years in liberal arts at the Iowa State Teachers College with suggestion of three-year nondegree courses for rural and grade teachers.

5. The enlargement of facilities for practice teaching at the State teachers college.

6. The establishment of additional normal schools.

7. The addition of men to the faculty of the State teachers college, to give half of their time to instruction and half as members of the staff of the State superintendent of public instruction to the supervision of work in the normal-training high schools.

GRADUATE WORK.

8. The encouragement of the development of graduate work at the Iowa State University and the Iowa State College of Agriculture and Mechanic Arts along the major lines of the institutions.
9. The adoption of a rule by the university according graduate status to none but students having a definite proportion of their registration in courses for graduates only.
10. The determination by the university senate, or some other representative body, of the departments to be encouraged to develop graduate courses.
11. The exercise of greater care by the graduate division of the State college in admitting students from other institutions to graduate standing.
12. The creation of a standing committee on graduate work, to consist of two members of the State board of education and three members each from the institutions giving graduate work, the latter to be elected for a term of years by the graduate faculties.

LIBERAL ARTS AT THE STATE COLLEGE.

13. The strict enforcement by the State board of education of the principle that departments of liberal arts and sciences at the Iowa State College of Agriculture and Mechanic Arts shall be simply service departments; especially the revision of the work offered in the departments of economic science, geology, physics, and mathematics, to secure conformity to this principle.
14. The abandonment of courses in chemistry at the Iowa State college which neither contribute to the major lines of that institution nor reenforce the work of the experiment stations.
15. The revision of the requirements for the degree of bachelor of science in the division of industrial science, to render it impossible to secure the degree except on completion of industrial and professional courses (in contradistinction to liberal arts courses) equal in amount to those required in technical curricula.

EXTENSION WORK.

16. The strict application of the principle of the major lines of work to the development of the extension enterprises of the three State institutions.
17. The establishment of a conference on extension work composed of members of the board of education and extension officers of the three institutions to discuss projects.

DUPLICATION IN EDUCATION AND PSYCHOLOGY.

18. The imposition of no external limitation upon facilities offered at the three State institutions for giving work in home economics, agriculture, and manual training until the present force of teachers

in the State schools is equipped to meet the obligations imposed by the State law.

19. Thereafter the delimitation of work in psychology and education at the State college to the amount requisite to meet the requirements of the first-class State certificate.

20. The provision of better practice facilities at the State university.

HOME ECONOMICS.

21. The development at the Iowa State University of home economics as a service department along lines that will make it of greatest value to students majoring in other courses of study.

22. The avoidance by the university of courses that duplicate the work offered at the State College of Agriculture and Mechanic Arts in the preparation of high-school teachers.

23. The establishment at the university of special lines of work for the training of hospital dietitians

24. The provision in the near future of enlarged accommodations for the department of home economics at the State College of Agriculture and Mechanic Arts.

25. The provision of opportunities for preparation in institutional and cafeterial management at the State College of Agriculture and Mechanic Arts.

26. The provision of special courses for the preparation of trade and industrial school teachers at the State College of Agriculture and Mechanic Arts.

27. The improvement of the accommodations provided for work in home economics at the Iowa State Teachers College.

28. Reorganization of the department at the State teachers college under a single head.

SUBCOLLEGIATE WORK.

29. The continuance of subcollegiate work at the State teachers college.

30. The abandonment by the State College of Agriculture and Mechanic Arts of all noncollegiate work, except for limited short courses, in winter or in summer, for special groups of students. The establishment of corresponding work in selected high schools throughout the State under the direction of the State college.

JOURNALISM.

31. The approval of the work in journalism now offered at the Iowa State University and the Iowa State College of Agriculture and Mechanic Arts and the limitation of it to approximately its present scope.

COMMERCE.

32. The moderate expansion and better correlation of courses now offered in various departments of the Iowa State University, rather than the creation of a separate school of commerce.

UTILIZATION OF BUILDINGS.

33. At the State university:

- (a) The construction of a library and an auditorium as the greatest present need.
- (b) The accommodation of one or both of the departments of botany and geology in the space thus released in the Natural Science Building.
- (c) The remodeling of the Old Science Building or the construction of a simple fireproof building to house the remaining department and its valuable collections (in case only one is accommodated in the Natural Science Building). Adequate provision for the departments of geology and botany to be a part of any building plans relating to the immediate future.
- (d) Larger utilization of the physics building.

34. At the State college:

- (a) The early construction of a library and an auditorium.

35. A definite survey of the effective use of present building facilities along lines suggested in this report.

COST OF BUILDINGS.

36. An annual allowance of 2 per cent of the cost of buildings for repairs and renewals of furniture.

37. The replacement of worn-out or antiquated buildings by modern structures of the same capacity.

38. The realization of the necessity of appropriating \$75,000 or \$80,000 worth of buildings to provide for every addition of 100 to the average attendance after the limit of the utilization of the present space has been reached.

PHYSICAL EDUCATION OF WOMEN.

39. The appointment of a regular woman physician at each of the three State institutions to supervise the physical training and the health of women students.

WORK AND SALARIES OF INSTRUCTORS.

40. The establishment of \$2,000 as the average salary for a department.

41. The general reduction of the number of one and two hour courses, especially in elementary work and in the first half of the college course, at the State university and the State college.

42. The reduction of the number of small classes (10 or under) at all three institutions.

43. More even distribution of teaching loads to reduce the number of large classes (30 or more) at all three institutions.

44. The employment of several additional instructors (the number to be determined by the number of student-clock-hours to be carried) at the State teachers college.

45. The provision of a greater number of courses of less than five hours a week (three-hour courses are suggested) at the State teachers college.

STATE AND INSTITUTIONAL ADMINISTRATION.

46. The readjustment of the official relationships between the office of the State superintendent of public instruction and the State board of education.

47. The inclusion of the president of the State college of agriculture and mechanic arts in the membership of the board of educational examiners.

48. The strict definition of the powers and functions of the finance committee.

49. The inclusion of the presidents of the State higher institutions ex officio in the membership of the State board of education, without power to vote.

50. A larger measure of faculty responsibility and a decrease of departmental autonomy at the State university.

51. The closer correlation of cognate departments in the practice school and in the academic divisions of the State teachers college.

52. The temporary discontinuance of football (and perhaps baseball) games between the State university and the State college of agriculture and mechanic arts.

APPENDIX A.

DISCUSSION OF CERTAIN DEPARTMENTS OF IOWA STATE COLLEGE.

CHEMISTRY.

As a reinforcement of the judgment of the commission with respect to the development of the department of chemistry at the Iowa State College, comparison is made between the announcement of courses in chemistry by the college and similar announcements by the University of Wisconsin and the University of Illinois. In the latter institutions it should be noted that the department of chemistry is not merely a service department, meeting the instructional and investigational needs of the colleges of agriculture and engineering and allied experimental work. These institutions have developed long advanced and graduate courses in general, theoretical, analytical, and applied chemistry, courses such as would be expected in a unified institution embracing a college of liberal arts and sciences, as well as colleges of agriculture and engineering, and also a great graduate school, in which the department of chemistry is a major factor. The announcements of the department of chemistry in the Iowa State College cover 109 different courses, each having a number. They represent at least 320 semester hours, after excluding 17 courses for which no credit hours are specified; 14 courses out of these 17 are "research" courses. Of the 109 courses, 8 are substantially four duplicate sets of two-semester courses, covering approximately the same ground, but having slightly varied credits to fit into curricula leading to different degrees.

The corresponding announcements in chemistry in the University of Wisconsin in 1914-15 comprised about 114 courses, and in the University of Illinois about 88 courses, of which 36 were for graduates only. The total number of semester hours represented by the 88 courses at Illinois was about 273. Each semester's work at Illinois and Wisconsin has been computed as a separate course, even if announced in the catalogue as a year course with a single number.

In the announcements of the department of chemistry of the Iowa State College no hint is given as to how many of the 109 courses are given in alternate years or in sequence, or how many of them have not been given at all; nor is it quite clear how far the different courses overlap. The announcements give the impression of a symmetrical development. The following tabulation of the instructional staff of the three institutions under discussion is illuminating:

Number of instructors.

	Iowa State College.	University of Illinois.	University of Wisconsin.
Professors.....	2	6	6
Associate professors.....	5	.....	2
Assistant professors.....	.....	4	6
Associates.....	.....	3	.....
Instructors.....	7	8	13
Assistants.....	10	19	21
Graduate assistants.....	.....	19	.....
Lecturers.....	.....	.....	6

It needs no argument to show that a staff of 2 professors, 1 of whom is on leave of absence, 5 associate professors, 1 of whom is on leave of absence, 7 instructors, and 10 assistants, of whom some are graduate students in the department, can not give every year 109 courses, involving more than 320 semester hours. Any endeavor to give a large proportion of these courses every year would certainly lead to a lowering of the grade of instruction through overloading of instructors.

MODERN LANGUAGES.

The department of modern languages offers instruction in French, German, and Spanish, aiming at "the selection of material to be used in the study of languages, so that they will be helpful to the student in the pursuit of the technical subjects which make up the main body of his work." In French 8 courses are offered, with a total of 23 semester hours, or if alternatives in advanced French prose be considered, 29 hours. Of this, 8 or 10 hours constitute work in elementary French, of which 6 hours are devoted to scientific French, with "selected readings in physics, chemistry, geology, and mineralogy." The purpose in giving 6 or 12 hours in advanced French prose, as announced above, is not quite clear, however, in view of the fact that so few high schools in the Middle West enable students to secure enough hours in that subject for admission, so that they could take advanced French in their freshman and sophomore years. Courses in Spanish, which are now considered important for engineers, number 4, with a total of 16 hours, of which 6 or 10 belong to elementary Spanish.

In German 20 different courses are announced, covering a maximum credit of 62 semester hours, of which 10 hours are in elementary courses for beginners and 6 for students who have had one year of high-school German. One course is for students in botany, bacteriology, chemistry, etc., 6 hours for the year; another having the same prerequisites and the same credit value is made up of "readings" in physics (such topics as sound, heat, light, and electricity), chemistry, geology, and mineralogy. A third is given in advanced German prose, a fourth in Goethe's "Faust," and a German "seminar" is devoted to some phases of Goethe's work. When compared with the modest offerings in Spanish and in French, the offerings in German appear somewhat excessive, especially when it is stated that only 5 students from home economics and industrial science constitute one of these advanced classes. In this connection it is to be noted that the Iowa State College offers a total of 62 semester hours in German as a service department, and the State University of Iowa offers 88 semester hours, exclusive of courses for graduate students only, but including a considerable number of advanced undergraduate courses designed to prepare students for strictly graduate work. The latter includes also courses which are given in alternate years, of which in 1914-15 there were 6 hours. These figures, of course, have little to do with the total number of students registered or the number of instructors required. Quite possibly the number of such students in the courses in the freshman and sophomore years is already greater at the State college than at the State university, but in these cases the larger number of students would be taking their work in sections of a single course instead of courses of different grades or different content.

MATHEMATICS.

The department of mathematics is one of the large service departments, and as a departmental staff, perhaps the largest in the State. It is estimated that nearly 80 per cent of all the students in Iowa State college pursue some course or courses in mathematics. In its capacity as a service department, it must offer more advanced courses than the department of English in order to support the advanced technical courses in physics and engineering. A student, however, may major in mathematics in the course in industrial science, and in that case he takes a total of 36 to 41 hours in the department. The department announces 13 courses for undergraduates, 19 for undergraduates and graduates, and 5 for graduates only. The announcement of 25 of these courses follows this note: "Mathematics 48, or any subject following 48 although taught regularly but once in two years, will be given at any time when there is sufficient demand to justify the formation of a class"; 11 of the 25 were not offered in 1915-16.

The courses thus developed in the department of mathematics include, first, the usual required work in algebra, trigonometry, analytical geometry, and calculus, and then a diversified group of advanced courses comparable with those offered by any department of mathematics in a liberal arts college; advanced integral calculus, theory of the functions of a complex variable, projective geometry, infinite series, vector analysis. Special courses for the assistance of engineers are higher mathematics for electrical engineers, 3 hours; advanced dynamics, 6 hours; differential equations of mathematical physics, 3 hours; and an introduction to the mathematical theory of electricity and magnetism, 3 or 4 hours. A course of questionable propriety in this institution is "*Mathematics as applied to social and economic problems, probability, finite differences, adjustment and use of mortality tables, annuities, life insurance and investments, and such other subjects as are adapted to the needs of those taking the subject.*" In this connection it is interesting to note that the offerings in the department of mathematics are more extensive and specialized than those to be found in such great engineering schools as Stevens Institute of Technology, and in Rensselaer Polytechnic Institute, which gives not only the usual undergraduate curricula in civil, electrical, and mechanical engineering, but offers graduate curricula leading to master's and doctor's degrees in engineering and science. The commission is of the opinion that the offerings of this department are more than sufficient for the needs of the college, even when the advanced work is given due weight. With a staff so large as this department has, opportunity should be given to the members to continue productive study even though they do not offer a great variety of advanced and graduate courses in mathematical specialties. The fact that these advanced courses are elected by but few students, or that some of them are given only in alternate years, does not affect the principle involved.

PHYSICS.

An illustration of what looks like a tendency to announce a group of graduate courses in advance of any large demonstrated demand is found in the department of physics, in which a student in the division of industrial science may also major. Without discussing the announcement of several courses with substantially the same content, though with varying credit, for example, "617. Physical Laboratory. Credit 2," and "615. Physical Laboratory. Similar to

617. Credit 1," attention is called to the following announcement of eight courses:

- 850. Thesis.
- 1041. Theory of heat.
- 1042. Wave motion and sound.
- 1043. Theory of light.
- 1044. Theory of electricity and magnetism.
- 1045. Research.
- 1046. Research.
- 1047. Physics seminar.

The amount of laboratory work and the number of recitations in studies 1041 and 1047 to be arranged.

Here it should be pointed out again that the State does not need two research laboratories of physics, unless they are so definitely differentiated that the enormously expensive apparatus for the best results in physical investigation need not be duplicated in any considerable measure.

ZOOLOGY.

The department of zoology is an interesting and significant example of a real service department, which in its announcements holds close to the purposes of a service department, at the same time including a wide range of courses which buttress the major interests of agriculture and home economics. It offers 20 courses for undergraduates, 10 for undergraduates and graduates, and 1 for graduates only; 14 of these are really courses in entomology, which in some institutions is constituted as a separate department. Students who wish to make zoology their major in the curriculum in industrial science have opportunity to specialize within this major in morphology, embryology, physiology, and entomology. The department might very well be encouraged to expand its courses in entomology, for example, "42-43. Research in entomology," giving a total of eight semester hours, into a graduate course proper, so closely is the work of entomology, and more particularly economic entomology, connected with the problems of a college of agriculture. The increasing importance of entomology as a field of scientific investigation and expert administration in the State may lead to the appointment of a State entomologist or to an entomological survey. The center of operations of such an office ought to be the State college. Just as the advanced and research work in geology should be placed at the State university, the advanced and research work in entomology should be developed at the State college, with prompt interchange of students and younger members of the faculty who develop talents in one direction or the other.

The one course for graduates only announced by the department, "Neurology, the comparative morphology and vertebrate nervous system, especially the physical anatomy, of the human brain," does not belong in the curriculum of the State college and clearly parallels a course or courses given in the State university in comparative neurology, both in the nonprofessional courses and in the college of medicine. This development of a graduate course at the State college probably represents the individual preference and strength of a professor, rather than a judiciously determined need of the department or the college.

APPENDIX B.

EXTENSION WORK.

AT THE UNIVERSITY OF IOWA.

From the earliest days members of the staff of the University of Iowa have given lectures and courses of lectures in various parts of the State on the subject matter in which they are specialists. This type of extension work, representing a number of the departments of instruction, is still continued, but without an organized plan.

The present extension enterprise of the university is known as the extension division. It is of about two years' standing. The first year the appropriation for this work by the State was \$15,000 and for the year 1915-16 it is \$10,000. The appropriation act specifically mentions "University extension work," but does not define it.

The extension enterprise is not an organic part of the university in the sense of representing the different departments of research and instruction. It is organized separately, the responsible officer is known as the director, and he does not have a seat in the university faculty. The organization calls for eight in the staff for the current year, although two places are for the present unfilled and three of the persons give only part time. The salary budget for the year is \$12,940.

The extension division reports directly to the president of the university. Its relations with the departments of the institution are purely advisory so far as the extension division is concerned, and the cooperation is voluntary on the part of the members of the university staff. Some members of the division have given instruction to university students during the year. No fees or compensation for services are given to any members of the university staff when they are absent on extension business, but their expenses are paid from the extension fund. The regular departments or enterprises of the university receive no allotment of funds from the extension division with the single exception that an annual appropriation of \$800 is at present set aside to meet the payroll of the Lakeside Laboratory, on Lake Okobji, in the northern part of the State. This laboratory has been in existence a number of years as a specialized study center for extension work in botany and related subjects. This allotment of \$800 does not cover all the expense of the laboratory.

The special staff for the extension division, aside from the director, is a specialist in business administration, one in educational service, one in debating and public speaking, one in accounting, one in social service, and one in social welfare. Most of these persons bear the title of instructor. The division is organized into bureaus, which are essentially projects or departments of work other than separate secondary organizations. The general purpose of the extension division is to be of service to the people of the State, particularly to municipalities and to business interests in them, in the way of making surveys,

giving advice, and in the holding of meetings and conventions. The enterprises or projects are as follows:

- Municipal information;
- Social welfare;
- Child welfare;
- Educational service;
- Business administration;
- Accounting for retailers;
- Debating and public speaking;
- Lectures;
- Training camp for camp-fire guardians.

Correspondence courses for college credit are in contemplation, but are not yet definitely organized.

Aside from the staff of the extension division itself, about two dozen members of the university staff have gone into the field by arrangement with the division. The extension division feels itself at liberty to call on others, when occasion may arise, for their services. None of the officers is under obligation to partake, but the director reports the best spirit of cooperation on the part of the university membership. This cooperation may be in the nature of lectures or the conducting of more or less definite convention work, the making of special studies in localities, or undertaking research surveys.

The object of the work of municipal information is to collect and to disseminate facts on the many phases of city, town, and village life in Iowa. The division meets the inquiries of municipal officers, voluntary organizations, commercial clubs, and individuals, with information on such problems as municipal government and administration, public utilities, town and city planning, advertising, business organization and methods, street improvement, transportation, public service rates, sewage, sanitation, and municipal accounting.

The project known as business administration is distinct from the above, inasmuch as it deals with retail merchants rather than with municipalities or those representing municipal problems. The service is rendered directly to retailers and also to organizations of retailers who desire to be advised as to the best method of procedure to enable them to assist themselves in their business administration and in methods of cost accounting.

The bureau or project of accounting for retailers concerns itself chiefly with the installation of definite accounting systems in the stores or establishments. It is reported that several of the large firms in the State have taken advantage of the opportunity to secure advice as to better ways of keeping accounts.

The above descriptions of the bureaus or divisions of the work are sufficient to explain the general character of the other enterprises. These enterprises operate largely through organizations of various kinds in the towns and cities and are likely to result in conventions and in some cases in the publication of a bulletin setting forth the best experience on a given subject of inquiry. As illustrations of the kinds of meetings and conventions that have been held, the following may be mentioned: Winter short course in merchandising, under the auspices of the Sioux City Commercial Club; part of the program at Dubuque of the Iowa State Retail Merchants' Association and short course in retailing; short course in Burlington in retail merchandising; conference at Iowa City on supervision for city superintendents, county superintendents, high-school principals, grade principals, and other supervisors; conference of commercial club secretaries at Iowa City; conference of Iowa Latin teachers at Iowa City; an annual day at Iowa City; a municipal lighting day at Iowa City; cooperation in the extension of Y. M. C. A. courses in the localities. If the local organization under which the meetings are held has finances sufficient, it may pay all necessary traveling expenses. The extension division carries the expense

necessary to organize the programs in case of such meetings as business institutes, short courses, and the like. About 260 meetings have been held during the past year.

An important part of the extension enterprise is represented in the loan collection of lantern slides. There are several hundred of these slides, which are loaned to high schools. The schools are not charged for use of the slides, the teacher or the schools paying only the express charges both ways and being responsible for broken slides. These slides represent objects and methods in the teaching of botany, geography, physical geography, German, Greek history, Latin.

The extension division has issued 12 bulletins as follows: No. 1, "Street Lighting," by A. H. Ford; No. 2, "Rate Making for Public Utilities," by Wm. G. Raymond; No. 3, "Engineering as a Profession," by Wm. G. Raymond; No. 4, "Store Lighting," by Arthur H. Ford; No. 5, "Economy of Time in Arithmetic," by Walter A. Jessup; No. 6, "Vocational Guidance in High Schools," by Ervin Eugene Lewis; No. 7, "Ninth Annual Announcement of the Iowa High School Debating League," edited by O. E. Klingaman; No. 8, "Water Works Statistics of Thirty-eight Cities of Iowa, with the Meter Rates of Seventy Cities," by John H. Dunlap; No. 9, "Work, Wages, and Schooling of Eight Hundred Iowa Boys in Relation to the Problems of Vocational Guidance," by Ervin E. Lewis; No. 10, "Principles of Advertising," by Philip J. Sodergren; No. 11, "Hygienic Conditions in Iowa Schools," by Irving King; No. 12, "Tenth Annual Announcement of the Iowa High School Debating League," edited by O. E. Klingaman.

AT THE IOWA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.

At Ames, extension work has assumed very large proportions, because it is founded on acts of the legislature of nearly 10 years' standing, because it receives the benefits of the Smith-Lever fund appropriated by Congress, and in part because of the character and intention of agricultural-college work in general. Two separate lines of extension enterprise issue from the institution, each under its distinct and separate organization. One is extension in agriculture and home economics and the other in engineering.

1. AGRICULTURE AND HOME ECONOMICS.

The extension of the results of experiment-station work, as well as of the teaching, is an enterprise of many years' operation. The legislature of 1906 authorized or defined the extension work, and the following year the statute was modified. In the former year the sum of \$15,000 was appropriated for the work and in the latter year the sum was \$27,000. The general purpose of the work as defined by the law and as practiced by the college is to extend to the people of the State the knowledge that is gained by the institution in its experimental and research work, and to make its teaching staff and organization of use to its constituency throughout the Commonwealth. Tests are made in different parts of the State, demonstrations are held, and instruction is given in corn judging and stock judging at the agricultural fairs, institutes, and clubs; farm bureau organizations are maintained; general application of the knowledge and advice accumulated at the institution is made to the farms and homes of the State.

The agricultural extension is organized in a separate department, reporting directly to the president through its director. The director of extension has

charge of the administration and organization of the various lines of extension work, receives reports from all members of the extension staff, and is himself part of the time in the field. There is a secretary of agricultural extension who does no field work, but has charge of the office force and makes the speaking, demonstration, and organization dates for the members of the extension department. Comprised in the staff of the department is a State leader of county agents, a State leader of boys' and girls' club work, a supervisor of correspondence courses, a State leader of dairy farming extension, a State leader of creamery extension work, together with such helpers as may be necessary.

The teachers giving the subject matter work throughout the State are members of the various college departments, receiving their instructions as to scientific data from the head of the department, but being under the administration of the extension director so far as appointments, dates, traveling, and salaries are concerned. Conferences between the various subject-matter departments in the college and the director or staff of the extension department tend to solidify the work and to bring all forces into close cooperation. The total extension staff, comprising the officers of the extension department and the extension teachers in the different departments or divisions of the college, numbers more than 50 persons. The subjects represented are animal and poultry husbandry, farm crops and soils, horticulture, veterinary medicine, agricultural engineering, agricultural education, rural sociology, home economics.

Cooperative extension work in agriculture and home economics is under the general oversight of the United States Department of Agriculture, under the terms of the Smith-Lever Act. The allotments of funds, by projects, for cooperative agricultural extension work for the fiscal year 1915-16 in all the States are published in the Weekly News Letters of the United States Department of Agriculture for November, 1915. The allotments for Iowa are as follows, arising from Federal, State, and local funds:

Total, \$229,878; administration, \$19,058; publications, \$71,974; county agents, \$47,210; home demonstration, \$30,000; movable schools, \$40,643; boys' club work, \$13,482; live stock, \$14,483; poultry, \$2,250; dairying, \$8,180; agronomy, \$11,875; horticulture, \$3,000; agricultural engineering, \$3,675; farm management, \$3,650; rural organization, \$1,600; other projects, \$22,798.

The projects of the agricultural extension department at Ames as planned for the year July 1, 1915, to June 30, 1916, are as follows:

- No. 1. Administration.
- No. 1-A. Printing and distribution of publications.
- No. 2. County agent work.
- No. 3. Home economics or home demonstration work.
- No. 4. Movable schools.
- No. 5. Boys' and girls' club work.
- No. 6. Pomology demonstration work.
- No. 7. Truck crops demonstration work.
- No. 8. Farm crops demonstration work.
- No. 9. Prevention of animal diseases.
- No. 10. Dairy farming extension work.
- No. 11. Creamery extension work.
- No. 12. Farm management demonstration work.
- No. 13. Animal husbandry demonstration work.
- No. 14. Poultry demonstration work.
- No. 15. Farm crops and soils demonstration work.
- No. 16. Agriculture in schools.
- No. 17. Landscape gardening demonstration work.
- No. 18. Correspondence courses.
- No. 19. Agricultural engineering extension work.
- No. 20. Rural social welfare.

2. ENGINEERING EXTENSION.

The extension enterprise in engineering at the Iowa State College is separate and distinct from the other extension work of the institution, being organized under its own directing officer, who is responsible to the president of the institution. This is entirely a college enterprise, being supported by appropriations that are made to the institution by the State and receiving none of the Smith-Lever fund. The sum of \$25,000 is used annually in the work. The regular staff comprises 8 persons, together with more than 20 local instructors who live at various points in the State. Aside from these are professors and associate professors in the college department of engineering who are engaged in extension enterprises. The engineering extension is coordinate with the agricultural extension and has much the same kind of organization, although dealing with a different line of problems. The engineering matters that relate particularly to the agricultural occupations are handled by the department of agricultural extension, inasmuch as they are not professional or are not taught from the point of view of the industrial classes.

The purpose of the engineering extension is to aid and instruct engineers, mechanics, supervisors of industrial concerns, and to be of service to municipalities desiring engineering advice.

The engineering extension is now projected into nine fields or lines of work, as follows:

1. The two-year vocational course at the college at Ames, for electricians, stationary engineers, mechanical draftsmen, and building superintendents. It is the purpose in this division to prepare the student definitely for the industries rather than to give the equivalent of a high-school or manual-training course. In this two-year work 6 men enrolled in 1913; 41 enrolled in 1914; in the fall of 1915 about 45 men entered. A certificate is given for this course, three being awarded in June, 1915.

2. Correspondence and class study at points outside the college. About 600 correspondents and class students in courses requiring from three months to two years for completion had been enrolled up to July, 1915. Industrial courses have been established in a number of the cities of the State, and the department has assisted in promoting and teaching industrial classes in other places.

has organized factory schools, courses for engineers and shopmen, and courses about the State in shop drawing, sheet-metal drawing, carpenter's drawing, cement products, and carpenter's arithmetic. Correspondence students are also accepted under certain conditions. All these courses are held in connection with an organization in the locality that is able to take care of the arrangements and to finance the enterprise.

3. Lecture work on technical and industrial subjects before conventions, labor unions, engineering societies, schools, and other bodies. About 82 such lectures already have been given, practically all of them by members of the extension staff.

4. Short courses for tradesmen were begun in 1913-14 by the holding of a course for painters, an enterprise that was continued the following year and which is now a permanent feature of the engineering extension work required by the master painters' association. Courses are also held for telephone operators, for telephone plant men, and for plumbers, steam fitters, janitors, and firemen.

5. The publication of bulletins in cooperation with the agricultural extension department, four of which have now been issued on manual training for rural schools. Technical bulletins have been published on street lighting, street

oiling, garbage disposal, automobile topics, and also one giving a list of practical books.

6. Automobile institutes were held in 27 towns in the State in 1914, said to be the first work of its kind in the Union.

7. Manual training for rural school teachers under a regular instructor, and in cooperation with the agricultural extension department. This work is correlated with the lines discussed in the bulletins on manual training.

8. A technical service bureau has been organized to give aid to municipalities on the various subjects about which they inquire or on developments that they may be considering. This service is rendered mostly by means of talks by practical men before representative bodies or organizations in the various municipalities. These talks or demonstrations have covered the subjects of roads and pavements, electric lighting, sewers and sewage disposal, water supply, and refuse collection and disposal.

9. Moving-picture films. A set of ten moving-picture films has been used the present year in the schools for educational purposes, showing the methods in use in various industrial occupations and establishments, together with suggestions for their improvement. The success of this service has warranted larger appropriations, and it is now being considerably extended.

At the time of the visit of the commission, class work was being conducted in 14 cities and towns in the State, with a total of 409 registrations. These classes continue throughout the winter. Students taking work by correspondence alone numbered 15. In the classes meeting in the different centers for manual training, the attendance of teachers is 17 to 25. Classes meet every Saturday.

AT THE IOWA STATE TEACHERS COLLEGE.

The extension enterprise issuing from the State Teachers College is definitely and concretely for the purpose of supplementing the previous training of teachers. Study centers are organized in the localities, usually in a high-school building, and under the direction of the county superintendent of schools. These meetings are held on Saturdays, and comprise sessions in forenoon and afternoon combined of about four hours. The study center may continue its meetings on some of the Saturdays throughout the entire school year.

The extension effort of the Iowa State Teachers College is two years old, having started in December, 1913. In the years 1913-14 and 1914-15 the work was supported entirely by counties or localities. The State has now made an appropriation of \$19,750 to cover both the per diem or salary of the instructors and the expenses.

The organization at Cedar Falls is known as the extension department of the Iowa State Teachers College, under the directorship of the head of the department of education, who reports directly to the president of the college. There is an assistant director. The heads of the subject-matter departments in the college are called on for this Saturday work in the outside localities. Aside from this, local teachers specially well qualified are secured, and at the time of the visit of the commission 39 of these outside teachers were under employment. City superintendents and other persons who are specialists in certain subject matter are drafted into the work.

The study centers in the localities are of different grades and degrees of efficiency. Some of them are at first in the nature of demonstration centers, to explain to the teachers the importance of the work and the necessity of constantly adding to their professional preparation. In 94 of the 99 courses, study

center work has been undertaken. In some cases there is only one study center in the county, particularly when there is one important railroad point where the teachers may easily assemble from parts of the county. In other counties there may be as many as four centers. Each center holds from 2 to 10 meetings in each year, averaging about 5. The number of teachers enrolled in these study centers to November 1, 1915, was 5,051.

Aside from these county centers, an intensive type of work is conducted on what is called the district-center plan. These represent smaller units, sometimes four or five in a county. The work is carried farther and in greater detail and if possible made more applicable to local conditions than in the county study centers. In 8 or 10 counties these district study centers are now organized. These district study centers are administered in the same way as the county study centers, and with the same type of local organization; they differ in their more intensive teaching.

The subject matter in the study centers of both kinds comprises the usual subjects in the school curriculum. Now that the law requires the teaching of agriculture and home economics in the schools, the demand on the part of the teachers for instruction in these subjects is naturally strong.

Inasmuch as the extension work issuing from the State Teachers College is designed only for teachers and to aid them directly in their school work, there is no conflict or duplication with other extension work in the State. At the State teachers institutes and other meetings, members of the extension staff of the State College of Agriculture and Mechanic Arts may give instruction in agriculture and home economics, and that institution also organizes boys' and girls' clubs and prosecutes other work that may have more or less direct relation to the efficiency of the schools; but that enterprise is not designed for professional work with teachers, and therefore the two enterprises proceed along their independent lines.

Under certain conditions, the teachers attending a study center may receive credit of one-half to one point in the State teachers college. The attendance on these study centers is not obligatory on the part of any teacher, but in practice nearly all the teachers of the county attend. It naturally gives them better chances for promotion and increases their efficiency in the schools.

Although covering practically the entire State, this extension work is really in its initial or formative stage. It is to be expected that very shortly it will become a more integral part of the work of the college, employing more persons both at the college and in the localities, and result in more definite credit to teachers who enroll as students, and count more specifically toward the securing or the renewing of the teachers' certificates. Already about 50 persons in the staff of the college are cooperating in these Saturday extension activities, and about an equal number from outside are also taking part as leaders, teachers, or organizers. When the work matures and assumes its full volume, it is probable that other days than Saturday will have to be given to it, and this may mean either a shift in the curriculum of the college, or else the employment of a larger staff and with some arrangement whereby this staff may be employed the other days either in teaching at the college itself or in various kinds of follow-up work in the State. The extension enterprise can not then be carried as extra duty on the part of the teachers, either in justice to the extension or to the regular teaching in the institution. The burden is now too heavy on the regular staff.

If this enlarged and solidified extension enterprise develops, it will be necessary to have some other arrangement on the part of the school system itself whereby teachers may be excused, with pay, for certain days or periods on

condition that they enroll and take part in a study-center or similar extension enterprise. In such an eventuality, which seems to follow logically from the situation, a large piece of educational organization will be required.

A regular system of college credits will also need to be devised. At present the conditions for receiving credit for college study center work are: (1) Thirty hours of class instruction for a whole credit, to be applied on the 120 hours required for graduation from the college, with (2) an additional 30 hours of home work, to be planned and assigned by the instructor in charge of the study center, and (3) a satisfactory examination on the work that has been covered. One-half credit may be secured for half of the above work. No teachers are enrolled for credit unless they have met all the conditions for college entrance. The conditions for receiving one-half credit in didactics, to apply on the rural-teachers' course or the normal course in teachers' college in the district study center work, are as follows: (1) Attendance on a district study center meeting for 16 hours of instruction; (2) presentation of one paper on some subject assigned by the local leader; (3) an examination on the book that is used as a text in the district study center course. These requirements and privileges suggest a considerable enlargement of the credit system if the professional extension work with the teachers should grow to meet the evident needs of the teachers of the State.

The commission commends this effort to provide extension teaching to aid the teachers of the State and recommends that larger appropriations be made for it to teachers' college, with a definite State-wide policy which shall have organic connection with the school system.

APPENDIX C.

THE HOUSING OF WOMEN STUDENTS.

Under the general authorization given by the board to discuss any matters which might, in its judgment, bear upon the welfare of the three State institutions, the commission takes the liberty of offering a few brief observations, without specific recommendations, on the housing of women students. The suggestions, which follow, are submitted rather as a summary of what appears to be the best current practice and as a tentative program for the consideration of the board than with the intention of criticizing adversely existing conditions.

Those in control of colleges and universities are manifesting a growing sense of responsibility for the moral and physical welfare of the rapidly increasing number of young women who go from the protection and care of their homes into coeducational institutions. To leave hundreds of young girls recently out of the high school, who are separated from parental influences for the first time, absolutely to their own devices in the conduct of their lives is now commonly regarded as a questionable practice. To intrust their physical well-being to uninterested boarding-house keepers is not less unwise. The girl entering college is in need of something more than intellectual training, sufficient housing, and adequate food. She requires social guidance and assistance in the establishment of character ideals. These can best be given in properly supervised dormitories.

The commission therefore commends the efforts of the State board of education to provide dormitories for the young women in the State educational institutions. There are now excellent dormitories at each of the schools, but all three need additional structures for the accommodation of young women. The immediate end which the commission believes the State should seek to attain in the institutional housing of women students might be stated as follows: There should be enough room so that the freshmen women may be cared for, with 10 per cent excess room for the accommodation of upper-class women. All first-year women, not living with relatives or friends, should be required to live in the dormitories. The surplus accommodation just mentioned permits of the retention in the dormitories of a certain number of mature students, by which arrangement the maintenance of a stable house government is furthered.

It is the opinion of the commission that large dormitories, housing from 100 to 150 women, directed by one preceptress, present certain social disadvantages. Since the rooms occupied by the young women are study rooms as well as sleeping apartments, the grouping of large numbers of students together in one dormitory renders it difficult, if not impossible, to insure quiet. No matter what is decided upon as the best exterior effect, it is suggested that dormitory structures should have an interior arrangement in which the maximum accommodation in one section does not exceed 60. Provision should be made in each dormitory constructed for evening games and dancing in the hour of recreation and relaxation immediately after supper.

It is entirely feasible to cook for all the women students of the institution in one adequately equipped kitchen, but it is believed that there is a gain in the

conditions of social intercourse if the number dining together is restricted to the above-mentioned maximum of 60. The cafeteria plan of feeding students may be economical. The commission favors the table of a well-administered dormitory, however, as more nearly approximating family conditions. Particularly as a boarding place for women students, the cafeteria has one very objectionable feature, namely, that the decision as to the amount of food to be purchased is left to the customer. Under these circumstances women students, out of caprice or because of the desire to economize, are likely to underfeed themselves. The commission thinks that an advisory relationship between the food-service department and the home-economics department should be established at each institution to make sure that the food shall be nourishing and attractive as well as furnished at the minimum cost to the institution and the student.

The commission is of the opinion that there should be systematic inspection and approval of the lodging quarters maintained at each institution. It suggests that the dean of women be authorized to exercise special supervision over the housing of women students in private residences, rooming houses, and sorority buildings, as well as in the institutional dormitories. In the performance of this task she may find it desirable to hold weekly advisory meetings with the women in control of the houses.

The question of rest rooms for women students has also been called to the commission's attention. Not infrequently a young woman must secure an hour's relaxation in a horizontal posture in order to be able to continue her class work. It may consume too much time if she goes to her room, and the fatigue of going and returning may offset the benefit gained. Indeed, if she reaches her own room she seldom returns until the next day. To meet these conditions the provision of rest rooms for women students, especially on the university campus, is advised.

APPENDIX D.

SUBSTANCE OF LETTER ADDRESSED TO THE EDITORS OF JOURNALS PUBLISHED IN THE STATE OF IOWA.

At the request of the Iowa State Board of Education, the United States Commissioner of Education has appointed a survey commission to make a report on the conditions and needs of the three State-supported institutions of higher education in the State of Iowa. Among the questions suggested for the consideration of this commission is that of the extension of courses in journalism. In order to facilitate the investigation of this question, the survey commission desires certain facts as to the services rendered hitherto by the Iowa colleges and college men to the journals of the State. The survey commission will, therefore, be especially grateful to you for information regarding two or three specific matters concerning the editorial and managerial staff of your publication. This, of course, excludes compositors or machine men, skilled laborers in binderies, stenographers, and bookkeepers.

1. How many persons are employed in the editorial and business departments?
2. How many of these are college men or women?
3. How many of these are graduates of colleges or universities in the State of Iowa?
4. Is there, in your judgment, a large and growing demand for men technically trained in journalism as a profession comparable with the profession of law or railroad management?

Agricultural Engineering Hall.....	1893	1,776	7,758	2,783	12,317	65.120	39.739	25.845	416	12,733	4,357	5,071	9,428	695	22,856	22,860
Agricultural Engineering Annex.....	1903	676	4,937	.....	5,613	46.325	46.575	21.576	6,541	12,154	3,326	5,514	8,840	.....	20,994	19,400
Agricultural Hall.....	1907-8	8,843	5,814	876	15,533	56.983	30.843	17.572	3,350	18,883	19,337	22,963	42,300	12,771	73,954	70,869
Central Hall.....	1904-5	16,960	4,948	.....	21,908	50.945	55.142	28.046	1,018	22,926	13,760	36,376	50,136	3,754	76,816	72,227
Engineering Annex.....	1910	5,242	5,956	1,530	12,728	49.680	44.006	21.868	6,273	19,001	5,235	7,452	12,687	312	32,000	32,632
Engineering Hall.....	1901-2	3,522	7,057	11,285	21,864	38.491	44.199	17.017	1,446	23,310	5,845	21,199	27,044	2,864	53,218	52,008
Forge shop.....	1896	.....	2,660	.....	2,660	44.000	100.000	44.000	.....	2,660	234	.....	234	.....	2,894	2,906
Gymnasium.....	1912-13	4,966	.....	.....	4,966	79.400	50.000	39.700	35,069	40,035	1,857	11,648	13,505	.....	53,540	47,245
Home economics.....	1909-10	1,751	9,287	.....	11,038	63.855	47.265	30.225	3,196	14,234	3,601	8,460	12,061	.....	26,295	24,492
Morrill Hall.....	1891	864	2,175	.....	3,039	41.625	35.225	14.643	20	3,059	8,001	6,357	14,358	2,730	20,147	20,252
Total.....		44,600	50,592	16,474	111,666	536.424	492.993	260.492	57,329	168,995	65,553	125,040	190,593	23,126	382,714	364,891
Plant average.....						53.642	49.299	26.440								

AT IOWA STATE TEACHERS COLLEGE.

Auditorium.....	1901	14,719	.....	909	15,628	57.775	36.348	20.98	403	16,031	1,423	40,094	41,517	1,012	58,560	82,036
Domestic science (temp).....				2,635	2,635	70.000	45.500	31.85	.....	2,635	64	.....	64	.....	2,699	1,000
Central Hall.....	1867	6,544	3,420	.....	9,964	64.830	47.405	30.72	872	10,836	932	6,990	7,922	320	19,078	22,400
Gilchrist Hall.....	1882	1,947	780	4,151	6,878	67.793	50.560	34.31	3,536	10,414	310	15,768	16,078	.....	⁵ 26,492	⁶ 25,740
Administration.....	1895	7,474	.....	852	8,326	66.880	45.610	30.51	1,861	10,187	3,898	16,339	20,237	.....	30,424	29,008
Teachers' training school.....	1912	18,086	2,741	.....	20,827	61.155	26.880	16.46	1,669	22,496	4,140	15,826	19,966	3,373	45,835	63,020
Gymnasium.....	1903	22,430	.....	.....	22,430	31.250	30.100	9.42	1,626	24,056	2,056	15,686	17,742	.....	41,798	45,540
Laboratory.....	1906	2,538	8,550	.....	11,088	60.297	36.542	22.01	4,323	15,411	2,867	6,555	9,422	.....	24,833	28,672
Total.....		73,738	15,491	8,547	97,776	479.980	318.945	196.26	14,290	112,066	15,690	117,258	132,948	4,705	249,719	297,416
Plant average.....						59.997	39.868	23.93								

¹ Where ratio is not given, complete information was lacking.
² See note on p. 105.
³ By superintendent of buildings or other official, verbally or in writing; discrepancies between "found" and "reported" space probably due to scale calculations and exterior measurements.
⁴ Not included in plant T.
⁵ Basement included.
⁶ Basement not included.

APPENDIX F.

STUDENT CLOCK HOURS, SALARIES, EXPENDITURES.

UNIVERSITY OF IOWA.

BOTANY.

Instructors.	Salary.	Student clock hour	
		First semester.	Second semester.
....., professor.....	\$2,500	168	25
....., professor.....	2,400	315	29
....., assistant professor.....	1,600	35	13
....., assistant.....	900	38	8
....., assistant.....	900	151	12
....., assistant.....	800	41	8
Total.....	9,100	748	96
Average.....	1,517	124	16

Classes.	Students in class.				
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40
Number of classes:					
First semester.....	12	6	4	4	.....
Second semester.....	9	6	5	5	.....

CHEMISTRY.¹

Instructors.	Salary.	Instructors.	Salary.
....., professor.....	\$3,000	....., (one-half time).....	\$600
....., assistant professor.....	1,900	....., assistant.....	900
....., assistant professor.....	1,800	....., assistant (one-half time).....	500
....., assistant professor.....	1,800	....., assistant (one-quarter time).....	300
....., instructor.....	1,200	....., assistant.....	100
....., instructor.....	1,000	....., storekeeper ²	700
....., instructor.....	1,000		
....., instructor.....	1,000	Total (11½).....	16,100
....., instructor.....	1,000	Average.....	1,430

Classes.	Students in class.						
	1 to 5	6 to 10	11 to 20	31 to 40	59 to 67	80	114
Number of classes:							
First semester.....	10	8	1	1	1	1	1
Second semester.....	12	6	.....	.....	2	.....	1

¹ Total number of student clock hours, first semester, 1,988; average, 178; second semester, 1,466; average, 130.

² Not included in total.

EDUCATION.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
—, dean	\$3,500	142	144
—, professor	2,500	234	160
—, assistant professor	1,800	152	278
—, assistant professor	1,600	382	378
—, associate professor	2,200	132	82
—, lecturer (1/2 time)	500	8	6
—, stenographer ¹	1,900		
Total (5 1/4)	12,100	1,050	1,048
Average	2,300	200	200

¹ Not included in total.

MODEL SCHOOL.

Instructors.	Salary.	Instructors.	Salary.
—, teacher	\$700	—, teacher	\$80
—, teacher	600	—, teacher	80
—, teacher	800	—, teacher	80
—, teacher	80	—, teacher	80
—, teacher	80	—, teacher	80
—, teacher	80		
—, teacher	80	Total	2,820

ENGLISH.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
—, professor and dean	\$3,500	133	138
—, assistant professor	1,900	401	397
—, assistant professor	1,900	396	354
—, assistant professor	1,900	370	386
—, assistant professor	1,900	258	212
—, assistant professor	1,900	355	275
—, instructor	1,200	192	176
—, instructor	1,300	345	329
—, instructor	1,000	289	254
—, instructor	1,200	197	193
—, instructor	1,200	220	256
—, instructor	1,200	248	310
—, ¹ (one-fourth time)	300	68	100
Theme readers, 2 instructors	1,995		
Office assistant ²	300		
Total (14 1/4)	22,395	3,472	3,380
Average	1,580	243	237

Classes.	Students in class.						
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 65
Number of classes:							
First semester	1	3	17	24	12	3	1
Second semester	1	5	21	23	10	1	3

¹ Head of department of English, Iowa City high school.

² Not included in total.

PUBLIC SPEAKING.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., assistant professor.....	\$1,650	212	170
....., assistant.....	900	270	280
....., assistant.....	100	.....	.....
Total (3).....	2,650	482	450
Average.....	1,325	241	230

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50
Number of classes:						
First semester.....	1	3	5	1	2	1
Second semester.....	2	3	2	2	2	1

GEOLOGY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor.....	\$2,600	231	232
....., professor.....	2,100	548	647
....., assistant professor.....	1,500	353	335
....., graduate student (one-third time).....	500	192	235
....., graduate student (one-third time).....	500	163	159
....., scholar (one-fifth time).....	150	148	84
Total (3½).....	7,350	1,635	1,692
Average.....	1,900	486	501

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50
Number of classes:						
First semester.....	2	4	2	2	4	1
Second semester.....	2	5	3	3	4	2

GERMAN.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor.....	\$3,000	344	288
....., assistant professor.....	1,650	375	340
....., assistant professor.....	1,500	319	325
....., assistant professor.....	1,650	488	344
....., assistant professor.....	1,500	392	302
....., instructor.....	1,200	468	409
....., assistant (4 months).....	80	.....	.....
....., instructor.....	1,200	347	298
Total.....	11,700	2,733	2,306
Average.....	1,671	390	329

GERMAN—Continued.

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	52 to 69
Number of classes:						
First semester.....	1	5	9	13	10	1
Second semester.....	3	4	13	17	2	1

GREEK.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor and University editor.....	\$3,000	77	151
....., instructor ¹ (one-third time).....	400	17	16
....., stenographer.....	433		
Total (1½).....	3,400	94	167
Average.....		71	125

Classes.	Students in class.			
	1 to 5	6 to 10	11 to 20	30 to 40
Number of classes:				
First semester.....	4	3	2	
Second semester.....	4	4	1	1

¹ Also manager of athletics, \$1,900.

HISTORY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., assistant professor and dean of women (one-fourth time).....		40	34
....., professor and dean.....	\$3,500	77	87
....., professor.....	2,100	154	172
....., assistant professor.....	2,000	206	185
..... (one-fourth time).....	300	15	52
....., assistant (read notebooks) (one-fourth time).....	500		
....., assistant (read notebooks) (one-fourth time).....	200		
....., instructor.....	1,200	724	687
Total (5).....	9,800	1,216	1,217
Average.....	1,960	251	243

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	50 to 62
Number of classes:						
First semester.....	6	5	4	3	1	2
Second semester.....	5	3	7	2	2	2

LATIN.

Instructors.	Salary.	Student clock hours	
		First semester.	Second semester.
....., professor	\$3,000	226	20
....., professor	2,100	82	84
....., assistant professor	1,500	163	10
Total (3)	6,600	471	40
Average	2,200	157	14

Classes.	Students in class.			
	1 to 5	6 to 10	11 to 20	21 to 30
Number of classes:				
First semester	4	6	5	
Second semester	4	6	6	

MATHEMATICS.

Instructors.	Salary.	Student clock hours	
		First semester.	Second semester.
....., professor	\$3,000	112	121
....., assistant professor	1,750	75	33
....., assistant professor	1,750	276	204
....., instructor	1,200	344	204
....., instructor	1,200	375	211
....., instructor	1,000	344	206
....., instructor	1,200	290	250
..... ² instructor (one-fifth time)	300	8	11
Total (7 $\frac{1}{2}$)	11,400	1,824	1,146
Average	1,580	253	159

Classes.	Students in class.			
	1 to 5	6 to 10	11 to 20	21 to 30
Number of classes:				
First semester	7	7	11	
Second semester	9	8	11	

¹ Sick second semester; others carried load.² Instructor in high school, full time.

PHILOSOPHY AND PSYCHOLOGY.

Instructors.	Salary.	Student clock hours	
		First semester.	Second semester.
....., dean	\$3,500	447	416
....., professor	2,500	102	80
....., professor	2,400	165	200
....., assistant professor	1,600	521	471
....., assistant professor	1,500	192	170
Total (5)	11,500	1,377	1,343
Average	2,300	275	269

PHILOSOPHY AND PSYCHOLOGY—Continued.

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	144 to 173
Number of classes:						
First semester.....	5	4	4	2	0	2
Second semester.....	5	3	4	1	1	2

MILITARY TRAINING.

Instructors.	Salary.	Instructors.	Salary.
—, professor.....	\$500	—, bandmaster.....	\$500
—, assistant.....	500	Band members.....	460

PHYSICAL TRAINING FOR MEN.

Instructors.	Salary.	Instructors.	Salary.
—, director.....	\$1,600	—, physical director.....	\$1,200
—, assistant.....	100	—, assistant.....	300
—, assistant.....	100		

PHYSICAL TRAINING FOR WOMEN.

Instructors.	Salary.	Instructors.	Salary.
—, director.....	\$1,500	—, matron.....	\$300
—, assistant.....	800	—, medical examiner.....	250
—, assistant.....	600		

PHYSICS.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
—, professor.....	\$3,000	57	186
—, assistant professor.....	1,850	424	356
—, assistant professor.....	1,850	335	130
—, instructor.....	1,200	323	270
—, assistant (half time).....	600	234	243
—, assistant (half time).....	600	252	234
—, assistant (half time).....	500	148	180
—, mechanician ¹	¹ 1,350		
—, shop assistants ¹	¹ 200		
—, undergraduate assistant.....	75	57	51
—, undergraduate assistant.....	75		
—, undergraduate assistant.....	75		
Total (6).....	9,825	1,817	1,680
Average.....	1,634	303	280

Classes.	Students in class.							
	1 to 5	6 to 10	11 to 20	21 to 30	69	73	111	133
Number of classes: ²								
First semester.....	8	4	18	3	0	1	0	1
Second semester.....	10	4	14	5	1	0	1	.....

¹ Not included in total.² Lecture and laboratory both counted. About two-thirds as many small classes.

POLITICAL ECONOMY AND SOCIOLOGY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
—, professor.....	\$3,000	283	Sick.
—, professor.....	2,400	332	333
—, associate professor.....	2,400	529	435
—, instructor (three-fourths time).....	1,500	177	230
—, assistant professor.....	1,800	397	494
—, assistant (half time).....	500	154	270
Stenographer, assistant ¹	¹ 300		
—, medical school.....	0	22	70
—, law school.....	0	42	26
—, extension.....	0	22	16
—, extension.....	0	24	38
—, extension.....	0	54	53
Total (5½).....	11,600	2,041	2,013
Average.....	2,200	388	834

Classes.	Students in class.								
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	53	68	89
Number of classes:									
First semester.....	6	5	8	4	1	5	1	1	1
Second semester.....	6	5	6	2	8	1	1	1	1

¹ Not included in total.

POLITICAL SCIENCE.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
—, ¹ professor.....	\$2,600	327	368
—, assistant professor.....	1,750	285	315
—, instructor (half time).....	500	117	150
—, assistant (half time).....	500	176	180
—, assistant (half time).....	500	102	176
—, lecturer.....	100	28	54
Total (3½).....	5,950	1,035	1,249
Average.....	1,700	296	356

Classes.	Students in class.								
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	56	68	
Number of classes:									
First semester.....	3	2	4	2	5	0	1	0	0
Second semester.....	3	1	1	7	4	1	0	0	1

¹ Was also director of Iowa Historical Society and drew salary as such.

ROMANCE LANGUAGES.

Instructors.	Salary.	Student clock hours.	
		First Semester.	Second semester.
—, professor.....	\$2,800	503	363
—, assistant professor.....	1,500	526	318
—, instructor.....	1,200	302	260
—, instructor.....	1,000	437	481
Total (4).....	6,500	1,768	1,422
Average.....	1,625	442	356

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50
Number of classes:						
First semester.....	2	2	5	2	5	2
Second semester.....	2	4	6	5	1	1

ZOOLOGY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
—, professor and director.....	\$3,000	315	300
—, professor.....	2,300	506	539
—, professor.....	2,100	277	305
—, assistant professor.....	2,000	72	78
—, assistant professor.....	1,600	318	145
—, instructor.....	1,100	186	159
—, assistant.....	1,000	110	108
—, assistant.....	400	62	56
—, assistant.....	350	186	158
—, assistant.....	200	52	46
—, undergraduate assistant, half time.....	50	101	85
—, undergraduate assistant, half time.....	50	101	85
—, storekeeper, half time ¹	150		
—, mimeographer, half time ¹	150		
.....	150		
Total (8½).....	14,300	2,387	2,152
Average.....	1,685	279	253

Classes.	Students in class.									
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	74	81	90
Number of classes:										
First semester.....	10	4	3	2	7	2	1	0	0	2
Second semester.....	12	4	4	4	2	4	0	1	1	0

¹ Not included in total.

HOME ECONOMICS.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor.....	\$3,000	268	129
....., assistant professor.....	2,500	603	304
....., instructor.....	900	246	230
....., clerk to dean ¹	1,960	.....	.....
Total (3).....	6,400	1,127	693
Average.....	2,133	376	329

Classes.	Students in class.						
	1 to 5	6 to 10	11 to 20	55	56	63	71
Number of classes:							
First semester.....	0	1	1	.....	1	.....	1
Second semester.....	2	2	1	1	.....	1	.....

¹ Not included in total.IOWA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS.
AGRICULTURAL EDUCATION.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor.....	\$2,700	51	191
....., assistant professor (one-third time).....	500	30	174
....., assistant professor.....	2,000	141	226
....., assistant (one-half time).....	1,000	100	56
Total (2½).....	6,200	322	627
Average.....	2,200	114	228

Classes.	Students in class.			
	6 to 10	11 to 20	31 to 40	51 to 60
Number of classes:				
First semester.....	5	1	3	.....
Second semester.....	2	3	2	.....

AGRICULTURAL JOURNALISM.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor (one-fourth time).....	\$712	90	146
....., assistant professor.....	1,450	146	170
Total (1½).....	2,162	236	316
Average.....	1,730	189	252

AGRICULTURAL JOURNALISM—Continued.

Classes.	Students in class.				
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40
Number of classes:					
First semester.....		3	4	2	.....
Second semester.....	2	1	5	2	1

AGRICULTURAL ENGINEERING.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., instructor.....	\$1,100	640	576
....., instructor.....	1,100	748	472
....., instructor.....	1,300	438	440
....., instructor.....	1,300	347	368
....., professor (one-half time; experiment station one-half time).....	1,500	126	275
....., assistant professor.....	1,800	600	476
....., associate professor.....	2,250	315	342
Total (5½).....	10,350	3,214	2,950
Average.....	1,590	495	455

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50
Number of classes:						
First semester.....	1	5	13	13	11	2
Second semester.....	3	8	22	15	6	1

ANIMAL HUSBANDRY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor (one-half time).....	\$1,500	624	255
....., professor.....	2,600	552	526
....., associate professor.....	1,700	627	724
....., associate professor.....	1,900	568	565
....., associate professor.....	1,600	662	573
....., associate professor.....	1,700	678	712
....., professor (one-half time).....	1,250	173	190
....., scholar.....	200	($\frac{1}{8}$)	(lab.) 124
....., scholar.....	200	($\frac{1}{8}$)	(lab.) 112
....., professor (one-half time at dairy farm).....	1,250	($\frac{1}{8}$)	226
....., assistant professor.....	250	($\frac{1}{8}$)	184
.....,		($\frac{1}{8}$)	115
.....,	1,500	90	92
Total (7½).....	15,650	3,974	4,401
Average.....	2,170	528	517

Classes.	Students in class.									
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	81 to 90	125
Number of classes:										
First semester.....		2	2	7	13	7	2	4	1	1
Second semester.....	1	.....	5	19	21	7	1	1	.....	1

BACTERIOLOGY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
_____, professor and dean (nine-tenths time).....	\$2,700	132	237
_____, assistant (one-half time).....	500	84	184
_____, assistant professor (six-sevenths time).....	1,200	173	274
_____, assistant (one-half time).....	600	53	232
Total.....	5,000	442	927
Average.....	1,850	164	342

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	41 to 50	51 to 60
Number of classes:						
First semester.....	14	4	7	1		
Second semester.....	6	6	15		1	1

BOTANY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
_____, professor (thirteen-fifteenths time).....	\$2,600	274	316
_____, associate professor.....	2,000	548	193
_____, assistant professor.....	1,350	211	385
_____, instructor (one-half time).....	600	159	95
_____, instructor.....	900	222	315
_____, fellow (two-fifths time).....	400	126	34
_____, instructor.....	800	506	293
_____, student assistant (one-fifth time).....	200	240	134
_____, student assistant (one-fifth time).....	200	256	78
_____, student assistant (one-fifth time).....	200	126	244
_____, (one-tenth time).....	50		78
_____, (one-tenth time).....	50		56
_____, (one-tenth time).....	50		69
_____, (one-tenth time).....	50		40
Total (6½).....	9,450	2,668	2,350
Average.....	1,490	423	349

Classes.	Students in class.							
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70
Number of classes:								
First semester.....	14	6	15	23	6	1	2	2
Second semester.....	1	4	21	16	5	5	3	

CHEMISTRY.

Instructors.	Salary.	Instructors.	Salary.
—, professor.....	\$2,700	—, assistant.....	\$900
—, associate professor.....	1,800	—, assistant.....	900
—, associate professor.....	1,800	—, assistant.....	950
—, associate professor.....	1,800	—, instructor.....	900
—, instructor.....	1,300	—, instructor.....	800
—, instructor.....	1,200	—, instructor.....	800
—, instructor.....	1,200	—, instructor.....	800
—, instructor.....	1,000	—, assistant instructor (three-fourths time).....	700
—, instructor.....	900	—, associate professor.....	2,000
—, assistant instructor.....	900	—, student assistant (one-tenth time).....	
—, instructor (one-fourth time).....	300	—, (one-sixth time).....	
—, assistant (one-half time).....	400	17 others.....	
—, assistant.....	850		

Instructors.	Salaries.	Student clock hours.	
		First semester.	Second semester.
Total (24½).....	\$26,492	10,572	9,095
Average.....	1,080	430	372

Classes.	Students in class.											
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	81 to 90	91 to 100	100 to 325
Number of classes:												
First semester.....	27	5	40	34	14	8	5	2	1	1	1	6
Second semester.....	28	13	29	19	12	2	9	2	0	2	2	7

The whole number of student clock hours was, for the first semester, 10,572; for the second semester, 9,095. The average for first semester was 430; for the second semester, 372.

CIVIL ENGINEERING.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
—, assistant professor.....	\$1,400	606	895
—, associate professor.....	2,000	534	617
—, instructor.....	1,000	679	407
—, professor (four-fifths time).....	2,200	331	477
—, professor.....	2,400	378	190
—, professor and dean.....	4,000		164
—, instructor (half time).....	800	156	115
—, associate professor (seventeen-eighteenths time).....	1,700	96	68
—, associate professor (five-sixths time).....	1,500	167	155
—, associate professor (three-fifths time).....	1,500	169	42
—, instructor.....	1,200	192	132
Total (8½).....	16,000	3,308	3,262
Average.....	1,820	376	373

Classes.	Students in class.							
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70
Number of classes:								
First semester.....	12	16	21	10	1	1	1	
Second semester.....	11	11	14	8	3	1	1	1

DAIRY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
_____, professor (half time).....	\$1,500	169	180
_____, associate professor (half time).....	1,000	53	192
_____, associate professor.....	1,900	554	675
_____, instructor.....	1,500	.....	48
_____, instructor.....	1,200	10	171
_____, instructor.....	1,200	.....	464
Total (4½).....	8,300	786	1,740
Average.....	1,840	197	340

ECONOMIC SCIENCE.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
_____, professor (twenty-two twenty-fifths time).....	\$2,200	235	58
_____, assistant professor (half time).....	900	19	72
_____, associate professor (three-fourths time).....	1,500	360	91
_____, assistant professor.....	1,500	315	282
Total (3).....	6,100	929	505
Average.....	2,030	310	168

Classes.	Students in class.						
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60
Number of classes:							
First semester.....	1	3	1	2	2	3	2
Second semester.....	1	6	4	1	1	2	.....

ELEMENTARY ENGLISH.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
_____, professor (twenty-seven twenty-ninths time).....	\$2,700	212	140
_____, assistant professor.....	1,900	47	192
_____, assistant professor.....	1,500	204	111
_____, assistant professor.....	1,400	114	153
Total (4).....	7,500	577	602
Average.....	1,875	144	150

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50
Number of classes:						
First semester.....	1	5	5	1	2	.....
Second semester.....	1	3	7	3	.....	1

ENGLISH AND LITERATURE.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
professor	\$2,500	60	36
instructor	900	188	122
instructor	1,100	292	185
assistant professor	1,400	254	144
instructor	900	276	242
instructor	1,150	232	132
assistant professor	1,250	110	126
associate professor	1,700	194	98
instructor	1,000	221	172
associate professor	1,400	138	218
assistant professor	1,400	222	192
instructor	1,200	228	234
.....	950	318	160
instructor	950	219	139
instructor	1,000	74	159
Total	18,800	3,026	2,359
Average	1,253	202	157

Classes.	Students in class.				
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40
Number of classes:					
First semester	4	15	42	27	1
Second semester	3	7	22	.....	.....

HOME ECONOMICS.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
professor and dean	\$2,500	207	76
instructor	1,000	249	363
instructor	1,200	328	310
instructor	900	200	379
associate professor	1,200	468	394
associate professor	1,600	125	55
associate professor	1,300	418	537
instructor	1,200	532	402
instructor	1,000	301	251
assistant professor (half time)	700	299	.....
instructor	1,000	386	272
associate professor (half time)	750	339	.....
instructor	1,000	386	322
instructor	1,000	488	356
assistant professor (two-thirds time)	1,000	179	174
instructor (half time)	700	.....	402
associate professor (half time)	1,050	.....	242
Total (15½)	19,100	4,905	4,535
Average	1,320	346	321

Classes.	Students in class.							
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70
Number of classes:								
First semester	1	2	51	30	10	2	3	1
Second semester	2	5	41	28	4	5	0	0

FARM CROPS.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor (half time).....	\$3,000	309	525
....., instructor.....	1,300	142	157
....., instructor.....	1,200	420	192
....., assistant professor.....	2,000	550	272
....., associate professor.....	2,100	487	525
....., fellow (two-fifths time).....	400	298	100
....., professor (half time, farm management).....	1,200	¹ 315	.....
....., fellow (two-fifths time).....	200	105	.....
....., fellow (two-fifths time).....	300	.....	101
....., scholar.....	200	.....	21
Total (7 $\frac{3}{8}$).....	11,900	2,626	1,893
Average.....	1,630	387	320

Classes.	Students in class.						
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60
Number of classes:							
First semester.....	1	4	5	15	19	1	.....
Second semester.....	2	3	4	21	6	.....	1

¹ Experiment station.

HORTICULTURE.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor and vice dean (20/33 time).....	\$2,000	343	18
....., instructor.....	1,300	301	250
....., instructor.....	1,300	222	251
....., instructor.....	1,200	297	283
....., assistant professor.....	1,500	312	305
....., instructor.....	1,200	152	61
Total (5 20/33).....	8,500	1,627	1,168
Average.....	1,500	286	206

Classes.	Students in class.							
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70
Number of classes:								
First semester.....	11	8	14	15	.....	3	.....	1
Second semester.....	13	5	9	11	1	.....	.....	.....

MECHANICAL ENGINEERING.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
professor (27/29 time).....	\$2,700	210	395
instructor.....	1,100	1,650	927
instructor.....	1,050	558	492
instructor.....	1,050	859	156
instructor.....	1,050	792	576
assistant professor.....	1,300	333	928
instructor.....	1,050	254	378
instructor.....	900	58	378
assistant professor.....	1,500	164	188
associate professor.....	2,200	231	170
assistant professor.....	1,500	259	235
associate professor.....	1,950	201	300
associate professor.....	1,900	331	265
associate professor.....	1,700	498	278
instructor.....	1,000	.....	158
student assistant.....	200	.....	253
Total (14 24/29).....	22,150	6,398	6,075
Average.....	1,475	426	430

Classes.	Students in class.									
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80	
Number of classes:										
First semester.....	10	7	34	13	9	8	1	1	1	
Second semester.....	43	39	37	22	5	2	2	.....	.....

PHYSICS.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
professor (14/15 time).....	\$2,800	609	.....
instructor.....	1,100	246	88
assistant professor.....	1,300	114	240
assistant professor.....	1,500	418	342
assistant professor.....	1,500	225	517
instructor.....	1,000	274	236
instructor.....	1,000	74	248
instructor.....	1,200	275	86
assistant professor.....	1,400	125	177
instructor (half time).....	500	.....	252
Total (9 6/15).....	13,300	2,360	2,186
Average.....	1,490	266	220

Classes.	Students in class.									
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	71 to 80	81 to 90	100 to 120	136 to 200	
Number of classes:										
First semester.....	3	2	37	6	2	3	.....	1	.....
Second semester.....	2	14	57	3	.....	1	3	.....	2	

ZOOLOGY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
(eleven-thirteenths time).....	\$2,200	4	(1)
, associate professor.....	2,000	180	94
, instructor.....	1,000	326	37
, associate professor (half time).....	850	122	100
, assistant professor.....	1,300	330	40
, instructor (half time).....	600	49	134
, instructor (half time).....	600	214	24
, assistant professor.....	1,500	248	74
, assistant professor.....	1,600	293	31
, (one-tenth time).....	50	.....	216
, (one-tenth time).....	65	217	.....
Total (7½).....	11,765	1,819	2,957
Average.....	1,550	280	456

Classes.	Students in class.									
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	71 to 80	81 to 90	139
Number of classes:										
First semester.....	7	13	18	5	.....	1	.....	1	1	.....
Second semester.....	21	14	31	7	2	1	6	1	1	.....

1 Sick.

MATHEMATICS.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
, instructor.....	\$1,200	274	302
, instructor.....	1,300	233	318
, associate professor.....	1,600	221	381
, instructor.....	1,200	320	294
, instructor (half time).....	500	269	.....
, instructor.....	850	238	225
, assistant (half time).....	500	275	.....
, associate professor.....	1,600	297	250
, associate professor.....	1,600	212	251
, associate professor.....	1,600	286	243
, instructor.....	1,300	307	231
, instructor.....	1,000	267	208
, professor (vice dean).....	2,100	215	112
Total.....	16,350	3,414	2,815
Average.....	1,370	262	235

Classes.	Students in class.			
	1 to 5	6 to 10	11 to 20	21 to 30
Number of classes:				
First semester.....	3	0	32	11
Second semester.....	7	1	24	9

PUBLIC SPEAKING.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., instructor	\$1,100	178	59
....., instructor	900	35	52
....., associate professor	1,400	264	224
Total	3,400	397	323
Average	1,133	132	108

Classes.	Students in class.			
	1 to 5	6 to 10	11 to 20	21 to 30
Number of classes:				
First semester	5	4	13	0
Second semester	1	5	9	1

FORESTRY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., associated professor	\$1,800	157	200
....., instructor	1,400	248	200
....., professor ($\frac{3}{4}$ time)	1,300	.....	16
Total	4,500	405	416
Average	1,740	160	164

Classes.	Students in class.				
	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50
Number of classes:					
First semester	3	4	2	0	2
Second semester	3	2	0	4	0

GEOLOGY AND MINING ENGINEERING.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor and vice dean ($\frac{3}{4}$ time)	\$3,300	85	139
....., assistant professor	1,500	77	110
....., associate professor	2,200	84	56
Total (2.94)	7,000	256	305
Average	2,380	87	91

Classes.	Students in class.		
	1 to 5	6 to 10	11 to 20
Number of classes:			
First semester	10	3	1
Second semester	8	2	1

HISTORY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., assistant professor.....	\$1,200	96	363
....., associate professor.....	2,250	93	252
Total.....	3,450	189	615
Average.....	1,725	95	308

Classes.	Students in class.				
	1 to 5	6 to 10	11 to 20	21 to 30	41 to 50
Number of classes:					
First semester.....	2	1	4	1	.....
Second semester.....	.....	1	1	4	.....

SOILS.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor (half time).....	\$1,750	200	182
....., associate professor.....	2,100	413	436
....., assistant professor.....	1,600	464	191
....., instructor (half time).....	600	464	191
....., professor (half time).....	1,250	193	60
Total (3½).....	7,300	1,734	1,060
Average.....	2,090	495	304

Classes.	Students in class									
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	81 to 90	.....
Number of classes:										
First semester.....	2	2	3	2	5	1	2	.....	1	.....
Second semester.....	11	4	5	3	1	1	.....	1	.....	.....

MODERN LANGUAGES.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor.....	\$2,250	114	63
....., instructor.....	1,200	292	208
....., instructor.....	1,200	210	175
....., instructor.....	1,200	278	228
....., instructor.....	1,200	247	275
....., instructor.....	1,200	260	331
Total.....	7,950	1,401	1,280
Average.....	1,325	234	313

MODERN LANGUAGES—Continued.

Classes.	Students in class.				
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40
Number of classes:					
First semester.....	6	2	9	5	.....
Second semester.....	7	6	16	2	1

MUSIC.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., associate professor (half time).....	\$800	116	274
.....	200	.....	62
Total.....	1,000	116	336
Average.....	.....	232	376

Classes.	Students in class.					
	1 to 5	6 to 10	21 to 30	31 to 40	41 to 50	51 to 60
Number of classes:						
First semester.....	.....	2	.....	1	1	1
Second semester.....	5	.....	2	1	1	2

PSYCHOLOGY.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., professor and chaplain.....	\$3,000	92	126
....., assistant professor.....	1,500	464	297
Total.....	4,500	556	423
Average.....	2,250	278	211

Classes.	Students in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	51 to 60
Number of classes:						
First semester.....	.....	.....	2	1	2	1
Second semester.....	1	2	5	1	1	.....

STRUCTURE DESIGN.

Instructor.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., associate professor.....	\$2,500	115	443

Classes.	Students in class.			
	1 to 5	6 to 10	11 to 20	21 to 30
Number of classes:				
First semester.....	3	3	2	0
Second semester.....	5	2	0	2

VETERINARY MEDICINE.

Instructors.	Salary.	Student clock hours.	
		First semester.	Second semester.
....., instructor.....	\$1,200	252	254
....., associate professor.....	2,000	317	299
....., professor.....	2,250	798	482
....., associate professor.....	1,900		
....., instructor.....	1,200	576	279
....., instructor (two-fifths time).....	400	120	40
....., professor.....	2,250	320	211
....., professor and vice dean.....	2,600	175	230
....., assistant professor.....	1,800	100	148
....., dean (five-eighths time).....	3,000	57	.....
Total.....	18,600	2,715	2,127
Average.....	2,065	302	236

Classes.	Students in class.									
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	51 to 60	61 to 70	71 to 80	81 to 90	
Number of classes:										
First semester.....	4	2	10	7	2	1	2	1	1	
Second semester.....	3	.....	13	8	2	.....	.....	1	.....

INSTRUCTORS AND STUDENT CLOCK HOURS.

First semester:	
Number of instructors.....	189.6
Number of student clock hours.....	61,069
Average number of student clock hours.....	322
Second semester:	
Number of instructors.....	190.8
Number of student hours.....	58,354
Average number of student hours.....	305

IOWA STATE TEACHERS COLLEGE.

EDUCATION.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
professor	\$2,700	560	420	310	540
professor	1,400	940	620	780	505
professor	2,000	.....	390	465	345
professor	2,000	720	660	525	614
professor	1,300	.....	555	595	475
professor	1,900	380	640	650	405
professor	1,800	.....	460	365	515
Total (7)	13,100	2,600	3,745	3,690	3,399
Average	1,871	650	535	527	485

Classes.	Number of students.						
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60
Number of classes	0	2	4	8	10	2	3

TEACHING.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$2,400	.....	¹ 1	.....	.....
.....	1,300	154	136	143	141
.....	1,300	154	136	147	158
.....	650	185	133	150	417
.....	1,200	154	111	140	155
.....	850	.....	265	270	397
.....	.....	² 1,305	.....	.....	.....
.....	1,100	.....	91	108	121
.....	1,100	154	141	130	162
.....	1,100	.....	20	30	54
.....	1,000	.....	140	95	96
.....	1,400	185	133	150	417
.....	1,400	.....	265	270	397
Total (12)	14,800	2,291	1,571	1,633	2,515
Average	1,233	327	143	148	229

ENGLISH.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
professor	\$2,300	410	418	320	279
professor	1,500	365	367	600	492
professor	2,000	340	463	402	399
professor	1,700	440	310	490	350
.....	1,500	.....	277	366	364
.....	1,700	214	303	197	276
.....	1,300	.....	392	380	405
Total (7)	12,000	1,769	2,530	2,755	2,565
Average	1,714	354	361	393	366

¹ Director.

² Lectures and demonstration teaching.

ENGLISH—Continued.

Classes.	Number in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50
Number of classes.....	1	4	9	6	2	1

LATIN.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$2,300	100	141	160	167
.....	1,400	120	190	205	145
Total (2).....	3,700	220	331	365	312
Average.....	1,850	110	165	183	150

Classes.	Number in class.		
	1 to 5	6 to 10	11 to 20
Number of classes.....	3	5	2

GERMAN AND FRENCH.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$2,300	325	375	365	345
.....	1,100	190	295	290	120
Total (2).....	3,400	515	670	655	465
Average.....	1,700	258	335	328	233

Classes.	Number in class.				
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40
Number of classes.....	2	2	3	2	1

MATHEMATICS.

Instructor.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$2,300	595	245	219	220

Classes.	Number in class.			
	1 to 5	6 to 10	11 to 20	21 to 30
Number of classes.....	1	1	3	1

PHYSICS AND CHEMISTRY.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$2,300	736	164	168	202
.....	1,500	.....	503	377	273
.....	.....	157	.....	.....	.....
.....	1,200	151	458	259	239
.....	1,300	.....	140	84	245
Total (5).....	6,300	1,044	1,265	888	959
Average.....	1,575	348	316	222	240

Classes.	Number in class.			
	1 to 5	6 to 10	11 to 20	21 to 30
Number of classes.....	4	1	5	3

NATURAL SCIENCES.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$2,100	217	567	253	1,162
.....	2,000	1,110	427	660	734
.....	1,900	746	448	287	511
.....	1,400	529	344	126	579
Total.....	7,400	2,602	1,786	1,326	2,986
Average.....	1,850	650	446	331	746

Classes.	Number in class.						
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60
Number of classes.....	3	3	3	3	2	1	3

HISTORY.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$1,500	410	405	285	196
.....	1,400	390	475	500	610
Total.....	2,900	800	880	785	806
Average.....	1,450	400	440	393	403

Classes.	Number in class.					
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50
Number of classes.....	3	1	3	2	2	3

GOVERNMENT.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$2,200	766	287	180	295

Classes.	Number in class.			
	6 to 10	11 to 20	21 to 30	31 to 40
Number of classes.....	2	1	$\frac{1}{2}$	$\frac{1}{2}$

ECONOMICS.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$1,800	467	321	436	366

Classes.	Number in class.	
	11 to 20	21 to 30
Number of classes.....	2	2

ART.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$1,500	460	90	195	225
.....	1,400	375	175	330	350
.....	1,100	.....	270	535	330
.....	.....	640	.....	.....	.....
Total.....	4,000	1,475	535	1,060	905
Average.....	1,333	492	178	353	301

Classes.	Number in class.				
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40
Number of classes.....	1	4	3	3	$\frac{1}{2}$

MUSIC.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$2,300	770	626	240	402
.....	1,300	.....	334	224	68
.....	1,500	.....	146	473	239
Total.....	5,100	770	1,106	937	709
Average.....	1,700	770	368	312	236

Classes.	Students in class.						
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60
Number of classes.....	1	2	3	2	1	1	1

MANUAL ARTS.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$2,300	215	135	193	304
.....	1,300	293	229	367	407
Total.....	3,600	508	364	560	711
Average.....	1,800	254	182	280	356

Classes.	Number in class.			
	1 to 5	6 to 10	11 to 20	21 to 30
Number of classes.....	1	4	3	1

HOME ECONOMICS.

Instructors.	Salary.	Student clock hours.			
		Summer.	Fall.	Winter.	Spring.
.....	\$1,600	280	286	340	254
.....	900	300	220	254	261
.....	1,000	336	280	.....	.....
.....	1,000	.....	187	299	200
Total.....	3,500	916	973	893	715
Average.....	1,166	305	243	298	238

Classes.	Number in class.				
	1 to 5	6 to 10	11 to 20	21 to 30	31 to 40
Number of classes.....	1	2	11	3	1

APPEN

ANALYSIS OF EXPENDITURES

		<table border="0"> <tr> <td>Training school.....</td> <td>\$39,050.49</td> </tr> <tr> <td>Library.....</td> <td>564.64</td> </tr> <tr> <td>Power house.....</td> <td>16,243.40</td> </tr> <tr> <td>Dormitory.....</td> <td>401.05</td> </tr> <tr> <td>Paving and walks.....</td> <td>549.19</td> </tr> <tr> <td>Furnishing new building.....</td> <td>2,077.04</td> </tr> <tr> <td></td> <td><hr/></td> </tr> <tr> <td></td> <td>58,885.81</td> </tr> </table>	Training school.....	\$39,050.49	Library.....	564.64	Power house.....	16,243.40	Dormitory.....	401.05	Paving and walks.....	549.19	Furnishing new building.....	2,077.04		<hr/>		58,885.81
Training school.....	\$39,050.49																	
Library.....	564.64																	
Power house.....	16,243.40																	
Dormitory.....	401.05																	
Paving and walks.....	549.19																	
Furnishing new building.....	2,077.04																	
	<hr/>																	
	58,885.81																	
Construction and land, \$58,885.81.																		
		<table border="0"> <tr> <td>Operating hospital....</td> <td>1,644.33</td> </tr> <tr> <td>Fees refunded.....</td> <td>5.00</td> </tr> <tr> <td></td> <td><hr/></td> </tr> <tr> <td></td> <td>1,649.33</td> </tr> </table>	Operating hospital....	1,644.33	Fees refunded.....	5.00		<hr/>		1,649.33								
Operating hospital....	1,644.33																	
Fees refunded.....	5.00																	
	<hr/>																	
	1,649.33																	
Special funds \$1,649.33																		
Teachers College, exclusive of extension work, \$298,488.65.																		
		Total operating expenses, \$237,953.51.....																
		<table border="0"> <tr> <td>Extension and industrial service, \$320.</td> <td>Study center work (extension).....</td> <td>\$320.00</td> </tr> </table>	Extension and industrial service, \$320.	Study center work (extension).....	\$320.00													
Extension and industrial service, \$320.	Study center work (extension).....	\$320.00																

Iowa State Teachers College, total expenditures, 1913-14, \$298,808.65.

IX G.

OF IOWA STATE INSTITUTIONS.

Education, equipment and supplies, \$22,- 707.06.	Library books and sup- plies.....	\$6,955.61
	Home economics.....	3,044.45
	Physics and chemistry.....	1,496.11
	Training school.....	2,070.79
	Natural science.....	1,987.24
	Music.....	2,659.65
	Orchestra.....	626.16
	General use of depart- ment.....	2,711.80
	Manual training.....	388.95
	Other departments....	766.30
	<hr/>	22,707.06

Instruction, \$139,984.63.....

Education.....	\$13,550.00	
Teaching.....	19,214.01	
English.....	17,500.00	
Latin and Greek.....	3,700.00	
German and French..	4,200.00	
Mathematics.....	7,500.00	
Physics and chemistry	8,560.00	
Natural science.....	9,933.33	
History.....	2,910.00	
Government.....	3,300.00	
Home economics.....	5,950.00	
Economics.....	1,700.00	
Music.....	7,220.00	
Art.....	3,373.33	
Commercial education.	2,820.00	
Manual arts.....	4,500.00	
Physical education....	5,930.00	
Balance, salaries.....	188.97	
	<hr/>	122,049.64
Summer term.....	17,934.99	
	<hr/>	139,984.63

	Salaries.	Labor, equipment, supplies.
Administration.....	\$16,192.33	\$1,904.39
Library.....	7,760.81	.....
Commencement.....	.....	983.76
Superintendent build- ings and assistant...	3,609.96	.....
Janitors and grounds..	10,071.60	1,000.00
Engineer and firemen..	4,226.00	2,000.00
Fuel.....	.....	10,881.68
Repairs.....	1,800.00	10,349.24
Printing.....	.....	2,664.29
Advertising.....	.....	1,501.23
Telephone and tele- graph.....	.....	316.53
	<hr/>	<hr/>
	43,660.70	31,601.12

General operating ex-
penses, \$75,261.82.

Construction and land, \$86,013.52.	Training school.....	\$607.98
	Power house.....	2,415.09
	Dormitory.....	72,084.87
	Vocational building...	8,879.94
	Furnishing new building.....	938.29
	Paving and walks.....	1,087.35
		86,013.52

Special funds, \$1,779.93. Operating hospital.... 1,779.93

Teachers College, exclusive of extension work, \$349,495.82.

Total operating expenses, \$261,702.37

Iowa State Teachers College, total expenditures 1914-15, \$357,598.33.

Extension and industrial service, \$8,102.51 } Study center work (extension)..... \$8,102.51

Education, equipment, and supplies, \$19,- 5.08.	Library books and sup- plies.....	\$7,747.07
	Home economics.....	2,767.03
	Physics and chemistry.....	1,391.25
	Training school.....	1,441.61
	Natural science.....	1,210.66
	Music and orchestra...	1,143.46
	Manual training.....	677.61
	Physical education....	617.47
	Rural education.....	1,043.03
	General use of depart- ment.....	1,341.71
	Other departments....	364.18
	19,745.08	

Instruction, \$158,581.60

Education.....	\$13,100.00
Teaching.....	19,698.75
English.....	18,125.00
Latin and Greek.....	3,700.00
German and French..	4,300.00
Mathematics.....	7,500.00
Physics and chemistry	9,975.00
Natural science.....	11,530.50
History.....	2,900.00
Government.....	3,600.00
Home economics.....	7,435.00
Economics.....	3,000.00
Music.....	8,280.00
Art.....	4,040.00
Commercial education.	2,900.00
Manual arts.....	4,620.00
Physical education....	6,550.00
Rural education.....	6,632.50
	137,886.75
Summer term.....	20,694.85
	158,581.60

General operating ex-
penses, \$83,375.69.

	Salaries.	Labor, equipment, supplies.
Administration.....	\$19,385.00	\$2,961.32
Library.....	10,359.39	.....
Commencement.....	.....	981.55
Superintendent build- ings and assistant...	2,700.00	.....
Janitor and grounds...	10,302.00	1,000.00
Engineer and firemen.	4,267.00	2,000.00
Fuel.....	.....	13,017.08
Repairs.....	3,465.00	9,092.80
Printing.....	.....	2,808.23
Advertising.....	.....	663.30
Telephone and tele- graph.....	.....	373.02
	50,478.39	32,897.30

	Hospital.....	\$47,547.37	
	Currier Hall.....	84,643.64	
	Annual House.....	13,582.25	
	Chemical building.....	7,931.55	
	Storehouse.....	3,127.76	
	Other buildings.....	1,688.93	
Construction and land, \$212,766.33.	Equipping new build- ings.....	28,142.53	
	Land purchases.....	12,395.59	
	Tunnel.....	8,713.73	
	Paving and walks.....	4,992.99	
		<hr/>	
			212,766.33
	Hospital.....	\$50,235.84	
	Homeopathic hos- pital.....	8,025.92	
	Currier Hall.....	19,267.80	
	Law loan books.....	168.40	
Special funds, \$82,- 275.94.	Storehouse.....	1,880.93	
	Tuition refund.....	25.00	
	Carr fund.....	2,330.00	
	Gifford fund.....	182.05	
	Lowden fund.....	150.00	
	Bryan fund.....	10.00	
		<hr/>	
		82,275.94	

State University, ex-
clusive of extension
and service, \$933,-
759.86.

Total operating expenses, \$638,717.59

The University of Iowa,
total expenditures,
1913-14, \$944,058.75.

Extension and indus- trial service work, \$10,298.89.	Epidemiologist.....	\$3,276.98
	University extension.....	7,021.91
		<hr/>
		10,298.89

Educational equipment and supplies, \$95,406.15.	Library books and supplies.....	\$21,006.73
	College of arts	22,354.73
	College applied science.....	12,527.92
	College of law.....	500.12
	College of medicine....	11,232.93
	Hospital deficit.....	11,408.17
	College of homeopathic medicine.....	77.61
	Homeopathic Hospital deficit.....	1,090.50
	College of dentistry...	11,886.19
	College of pharmacy...	1,913.05
	Graduate college.....	371.03
	Fine arts.....	891.70
	Summer session.....	145.47
	95,406.15	

struction, \$364,413.08.....

College of arts	\$183,008.00
College of applied science.....	34,880.00
College of law.....	23,975.00
College of medicine....	58,769.51
College of homeopathic medicine.....	5,300.00
College of dentistry...	25,100.00
College of pharmacy...	5,600.00
College of fine arts...	6,200.00
Music, tuitions.....	6,412.22
Graduate college.....	5,520.00
	354,764.73
Summer term.....	9,648.35
	364,413.08

General operating expenses, \$178,898.36.

	Salaries.	Labor, equipment, supplies.
Administration.....	\$22,915.58	\$4,754.82
Library.....	7,123.32	.....
Commencement and general lectures.....	2,321.35	.....
Superintendent building, assistant.....	6,332.59	82.98
Janitors.....	21,069.74	3,247.95
Engineer and firemen.	9,158.05	1,329.99
Fuel.....	.....	31,712.77
Repairs.....	.....	30,033.99
Printing.....	.....	5,059.38
Advertising.....	.....	2,569.84
Telephone and telegraph.....	.....	1,184.71
Gas, water, electricity, ice.....	.....	6,405.69
Postage.....	.....	3,634.00
Miscellaneous.....	.....	16,214.90
Alumni secretary and bulletin.....	2,720.00	1,026.71
	71,640.63	107,257.73

Educational equipment and supplies, \$100,532.91.	Library books and supplies.....	\$18,776.13
	College of Arts.....	21,671.78
	College of Applied Science.....	13,280.65
	College of Law.....	1,162.08
	College of Medicine.....	12,593.85
	Hospital deficit.....	12,868.35
	College of Homeopathic Medicine.....	125.49
	Homeopathic Hospital deficit.....	1,787.57
	College of Dentistry.....	13,748.42
	College of Pharmacy..	2,003.95
	Graduate College.....	384.53
	Fine Arts.....	1,304.47
	Summer session.....	825.64
		100,532.91

struction, \$388,233.74.....

College of Arts.....	\$193,528.28
College of Applied Science.....	37,821.30
College of Law.....	23,350.00
College of Medicine....	63,240.18
College of Homeopathic Medicine.....	5,300.00
College of Dentistry...	27,059.99
College of Pharmacy..	6,615.00
College of Fine Arts...	4,545.00
Music, tuitions.....	9,555.75
Graduate College.....	6,800.00
	377,815.50
Summer term.....	10,418.24
	388,233.74

	Salaries.	Labor, equipment, supplies.
Administration.....	\$25,371.73	\$6,415.75
Library.....	7,380.00	.....
Commencement and general lectures.....	2,379.19	.....
Superintendent buildings, assistant.....	6,392.66	124.10
Janitors.....	22,896.12	2,721.96
Engineers and firemen..	7,351.32	1,309.59
Fuel.....	.....	25,841.42
Repairs.....	.....	30,257.45
Printing.....	.....	4,181.28
Advertising.....	.....	2,511.62
Telephone and telegraph.....	.....	1,287.11
Gas, water, electricity, ice.....	.....	4,334.93
Postage.....	.....	3,735.00
Miscellaneous.....	.....	11,973.46
Alumni secretary and bulletin.....	2,840.00	542.00
	74,611.02	95,235.67

eneral operating expenses, \$169,846.69.

State College, exclusive of extension and serv- ice, \$1,037,833.47.	Construction and land, \$317,978.63.	Gymnasium.....	\$3,040.71
		Chemistry building ...	172,282.28
		"Emergency".....	4,040.43
		Mechanical engineering building.....	40,051.90
		Transportation build- ing.....	49,801.60
		Heating plant.....	18,941.60
		Margaret Hall Annex..	5,617.00
		Sewage plant.....	4,072.74
		Other buildings.....	6,007.02
		Improvement of grounds.....	14,123.21
		317,978.63	
	Special funds, \$95,846.55	Agricultural engineer- ing.....	\$861.68
		Dairy.....	28,995.23
		Farms.....	19,238.33
		Horticulture.....	2,735.09
Veterinary hospital...		2,281.39	
Other departments....		8,948.18	
Operating hospital....		9,886.60	
Operating storeroom..		10,603.89	
Women's dormitory...		4,277.05	
School fund.....		1,362.50	
Fees refunded.....	6,656.61		
	95,846.55		
	Total operating expenses, \$624,008.29.....		

Iowa State College of
Agriculture and Me-
chanic Arts, total
expenditures, 1913-14,
\$1,461,684.25.

Extension and indus- trial service work, \$424,850.78.	Construction, \$42,874.10	Serum plant and equip- ment.....	\$21,750.77
		Land purchased.....	21,123.33
			42,874.10
	Special funds, \$142,444.59.	Agricultural experi- ment station.....	\$15,028.11
		Engineering experi- ment station.....	1,582.64
		Agricultural extension.	761.43
		Serum fund.....	125,072.41
			142,444.59
		Operating expenses, \$239,532.09.....	

Educational equip- ment and supplies, \$144,974.02.	Library books and sup- plies	\$6,958.96
	Agricultural division..	59,241.35
	Agricultural engineer- ing.....	4,529.02
	Engineering division..	25,715.44
	Home economics	20,883.08
	Veterinary medicine..	8,008.62
	Industrial science.....	3,120.64
	Noncollegiate	14,303.81
	Veterinary practical course.....	588.56
	Summer term.....	1,624.54
	144,974.02	

Instruction, \$313,158.01.....

Agriculture.....	\$106,006.17
Agricultural engineer- ing.....	12,420.99
Engineering.....	78,627.77
Home economics.....	52,699.24
Veterinary medicine..	16,854.73
Industrial science.....	7,547.22
Noncollegiate.....	31,647.95
	305,804.07
Summer session.....	7,353.94
	313,158.01

	Salaries.	Labor, equipment, supplies.
Administration.....	\$27,350.00	\$8,282.58
Library.....	6,712.43	.....
Commencement and general lectures.....	.....	2,053.23
Janitors.....	14,726.75	1,641.26
Engineers and firemen.	9,786.78	10,113.54
Fuel.....	.....	36,318.37
Repairs and contingent	.....	39,034.51
Printing and advertis- ing.....	.....	5,495.33
Care grounds.....	989.63	3,371.85
	59,565.59	106,310.67

General operating ex-
penses, \$165,876.26.

Experimental work, \$145,544.09.	Agriculture.....	\$51,173.46	\$62,990.32
	Engineering.....	6,195.71	7,067.07
	Good roads.....	4,166.48	4,962.36
	Veterinary.....	2,328.43	6,660.26
		63,864.08	81,680.01
Extension work, \$93,988.	Agriculture.....	\$43,673.51	\$29,770.12
	Engineering.....	8,435.86	5,964.91
	Hog cholera serum....	6,143.60	.....
		58,252.97	35,735.03

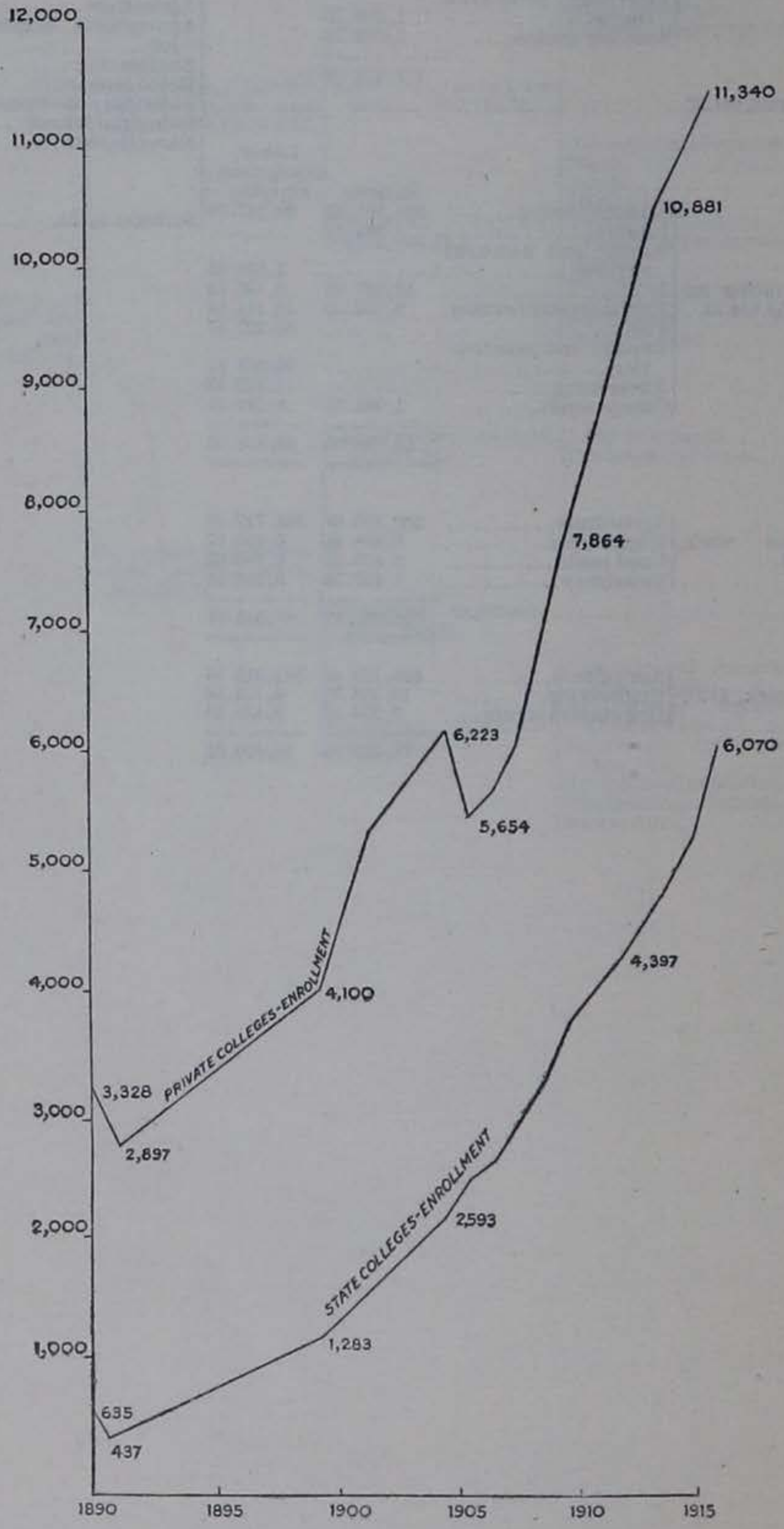
Iowa State College of Agriculture and Mechanic Arts, total expenditures, 1914-15, \$1,599,430.41.

		{ Chemical building \$128,892.22 Women's dormitory 52,096.52 Plant industry building 57,038.13 Steam and gas laboratory 13,989.84 Transportation building 22,247.24 Central heating plant 32,569.47 Dormitory annex 10,494.86 Other buildings 4,509.94 Grounds, improvement 16,498.30 <hr/> 338,336.52
(State college, exclusive of extension and service, \$1,150,081.67.	Total operating expenses, \$687,144.73.	
	{ Agricultural education \$2,418.86 Dairy 38,500.71 Farms 23,918.81 Horticulture 3,594.07 Veterinary hospital 2,933.29 Other department sales 14,355.34 Hospital 10,168.28 Storeroom 10,383.88 Dormitories 9,995.31 Scholarships 1,924.96 Fees refunded 6,406.91 <hr/> 124,600.42	
	Special funds, \$124,600.42.	
	{ Construction and land, \$14,778.21. { Land purchased \$10,875.00 { Drainage and fence 3,903.21 <hr/> 14,778.21	
Extension and industrial service work, \$449,348.74.	Operating expenses, \$294,228.82.	
	{ Agricultural experiment station \$19,815.91 Engineering experiment station 1,270.22 Veterinary investigation 225.67 Agricultural extension 1,038.48 Engineering extension 1,319.75 Serum fund 116,671.68 <hr/> 140,341.71	
	Special funds, \$140,341.71.	

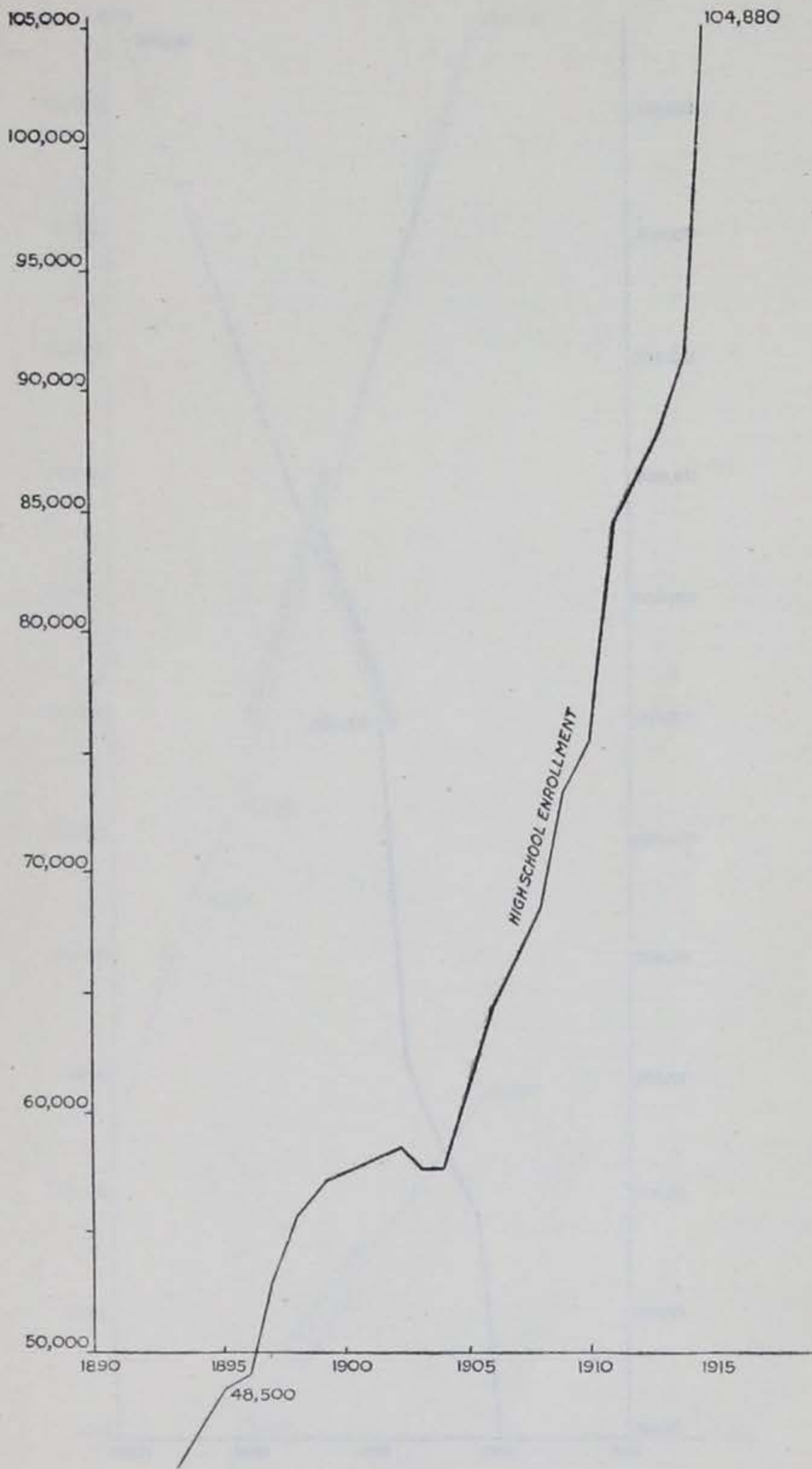
Educational equipment and supplies, \$172,218.11.	Library books, supplies.	\$7,844.52		
	Agricultural division..	63,207.74		
	Agricultural engineering.....	5,095.51		
	Engineering.....	30,523.53		
	Home economics.....	25,868.10		
	Veterinary medicine..	7,172.51		
	Industrial science.....	3,157.83		
	Noncollege.....	24,666.87		
	Veterinary practice course.....	1,588.77		
	Summer session.....	3,092.73		
		<u>172,218.11</u>		
Instruction, \$362,291.87.....				
			Labor, equipment, supplies.	
	Salaries.			
General operating expenses, \$152,634.75.	Administration.....	\$28,201.33	\$9,347.00	
	Library.....	7,283.32		
	Sunday and general lectures.....		2,635.98	
	Janitors.....	16,927.40	2,196.16	
	Engineers and firemen.	9,682.09	10,414.53	
	Fuel.....		30,227.47	
	Repairs and construction.....		25,661.22	
	Advertising.....		5,112.43	
	Care grounds.....	1,701.51	3,244.31	
		<u>63,795.65</u>	<u>88,839.10</u>	
				Summer term.....
				<u>9,998.05</u>
				<u>362,291.87</u>
Experimental work, \$163,883.32.	Agriculture.....	\$60,895.69	\$68,727.78	
	Engineering.....	8,838.86	6,046.27	
	Good roads.....	5,670.25	6,780.35	
	Veterinary.....	1,432.58	5,491.54	
		<u>76,837.38</u>	<u>87,045.94</u>	
Extension work, \$130,345.50.	Agriculture.....	\$55,753.43	\$41,913.08	
	Engineering.....	10,558.50	6,753.58	
	Hog cholera serum.....	7,233.32	8,133.59	
	<u>73,545.25</u>	<u>56,800.25</u>		

APPENDIX H.

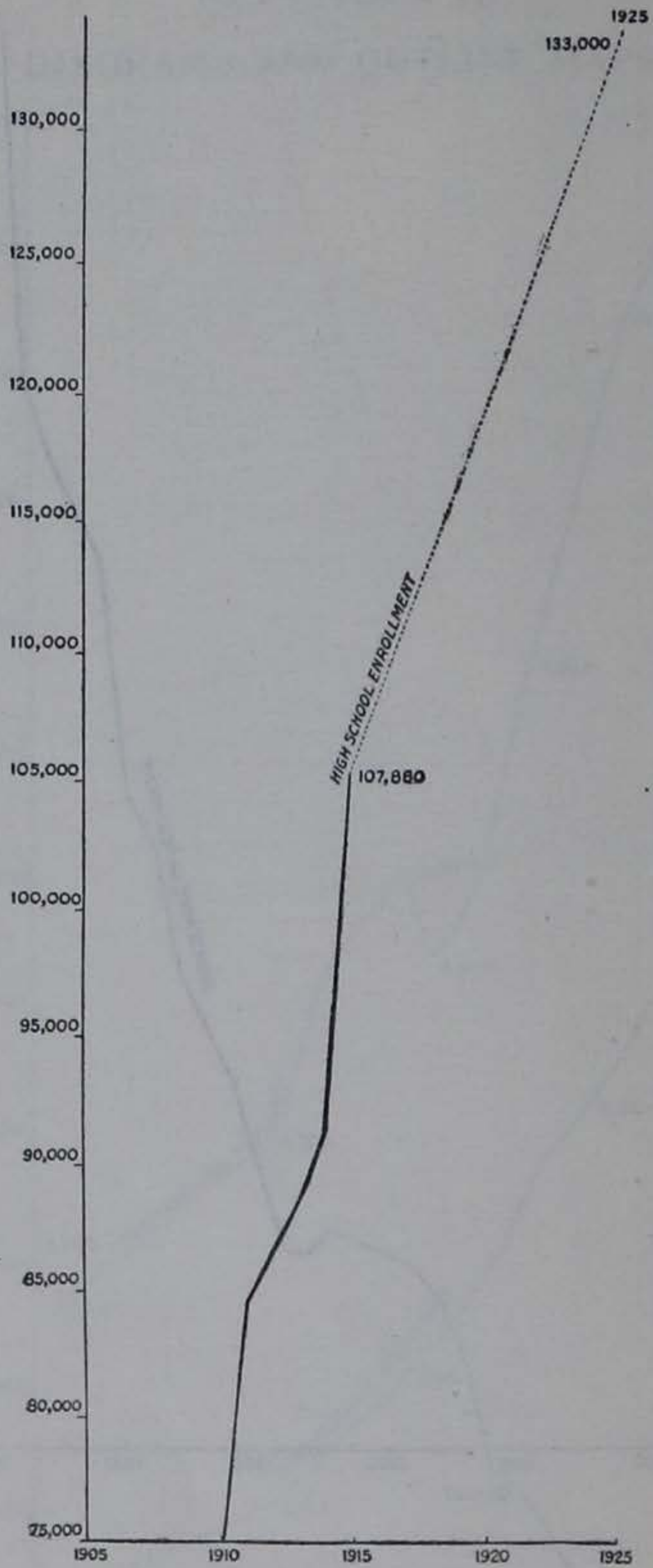
DIAGRAMS AND OUTLINE MAPS.



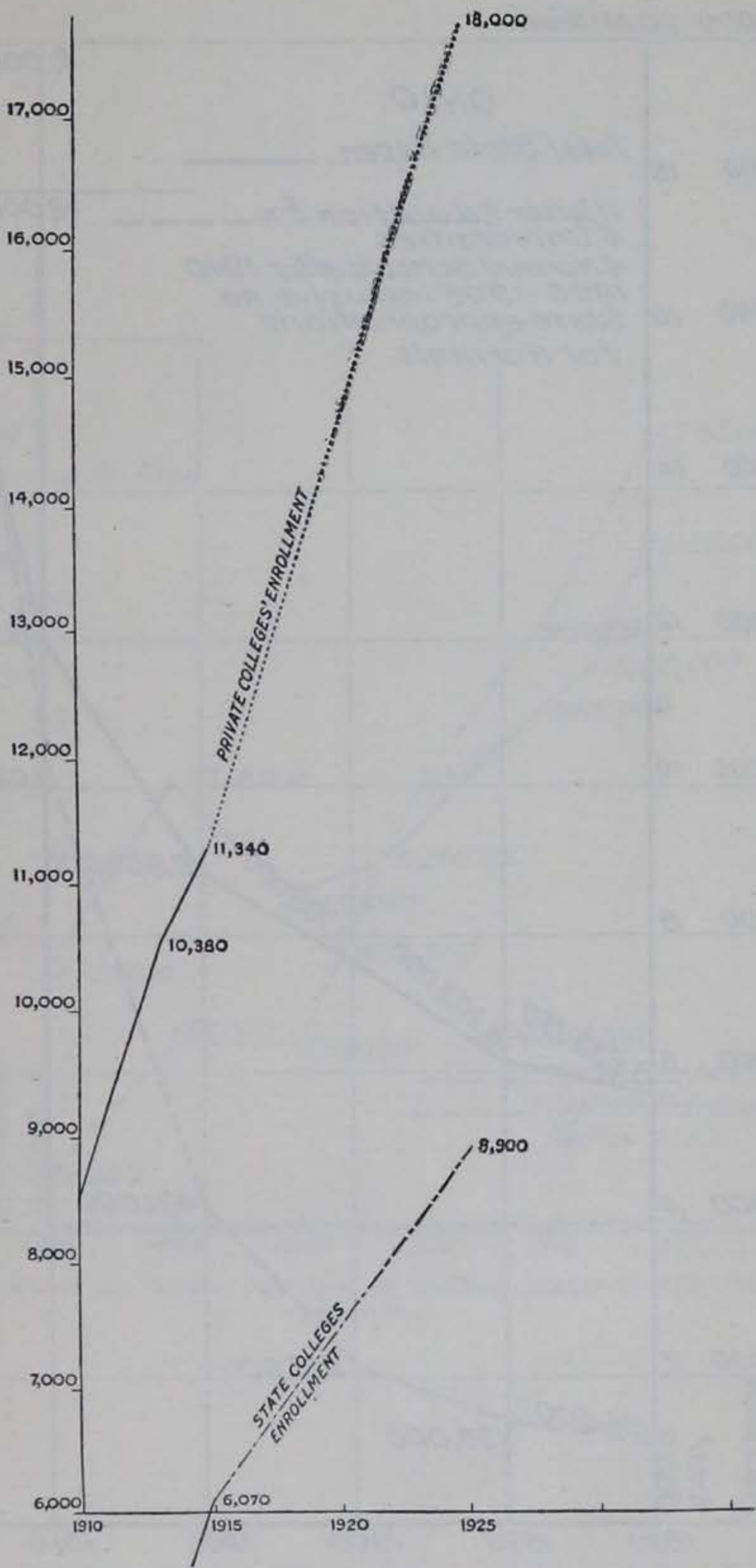
Private and State College enrollment, Ohio.



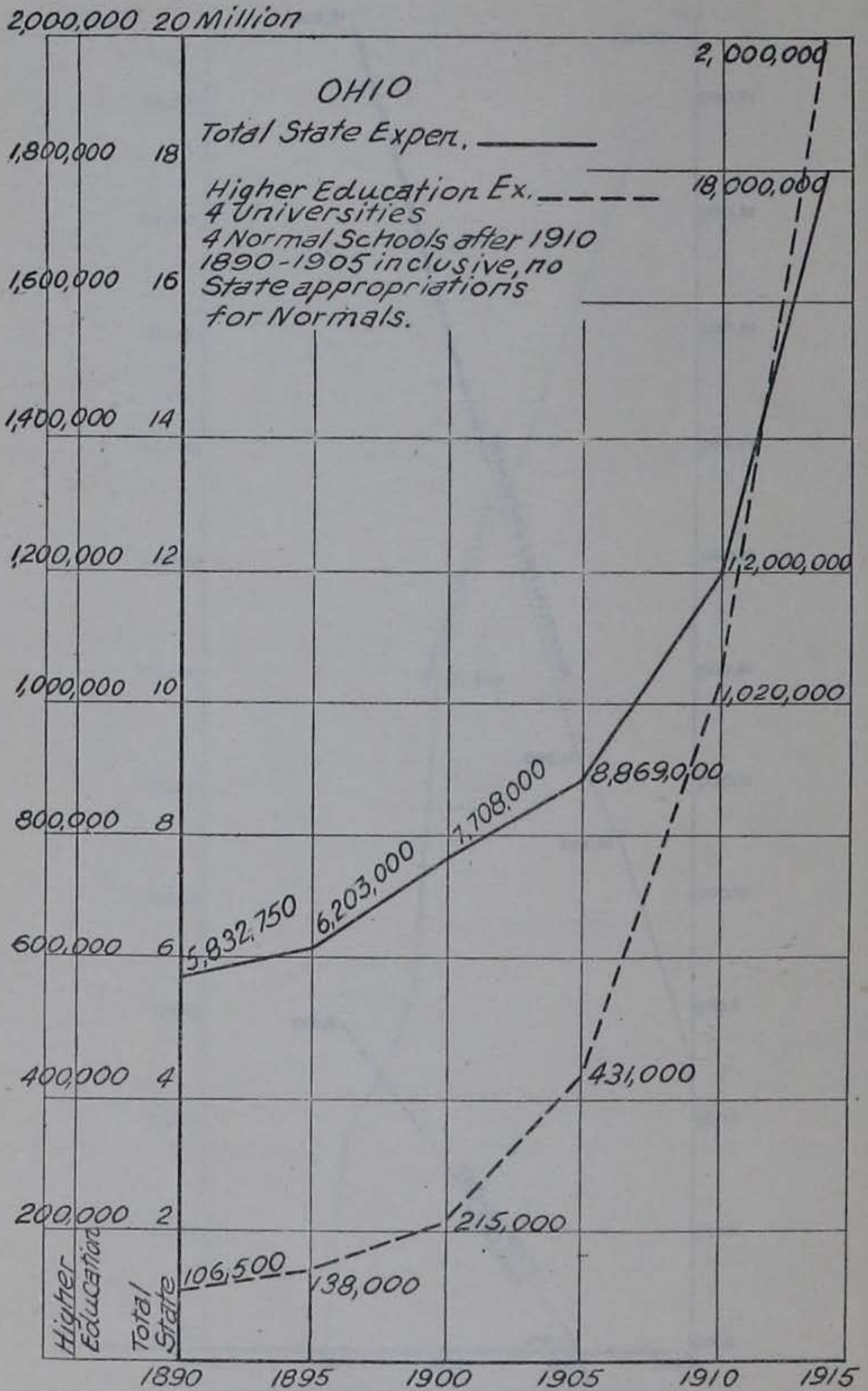
Growth of high-school enrollment, Ohio, 1890-1915.



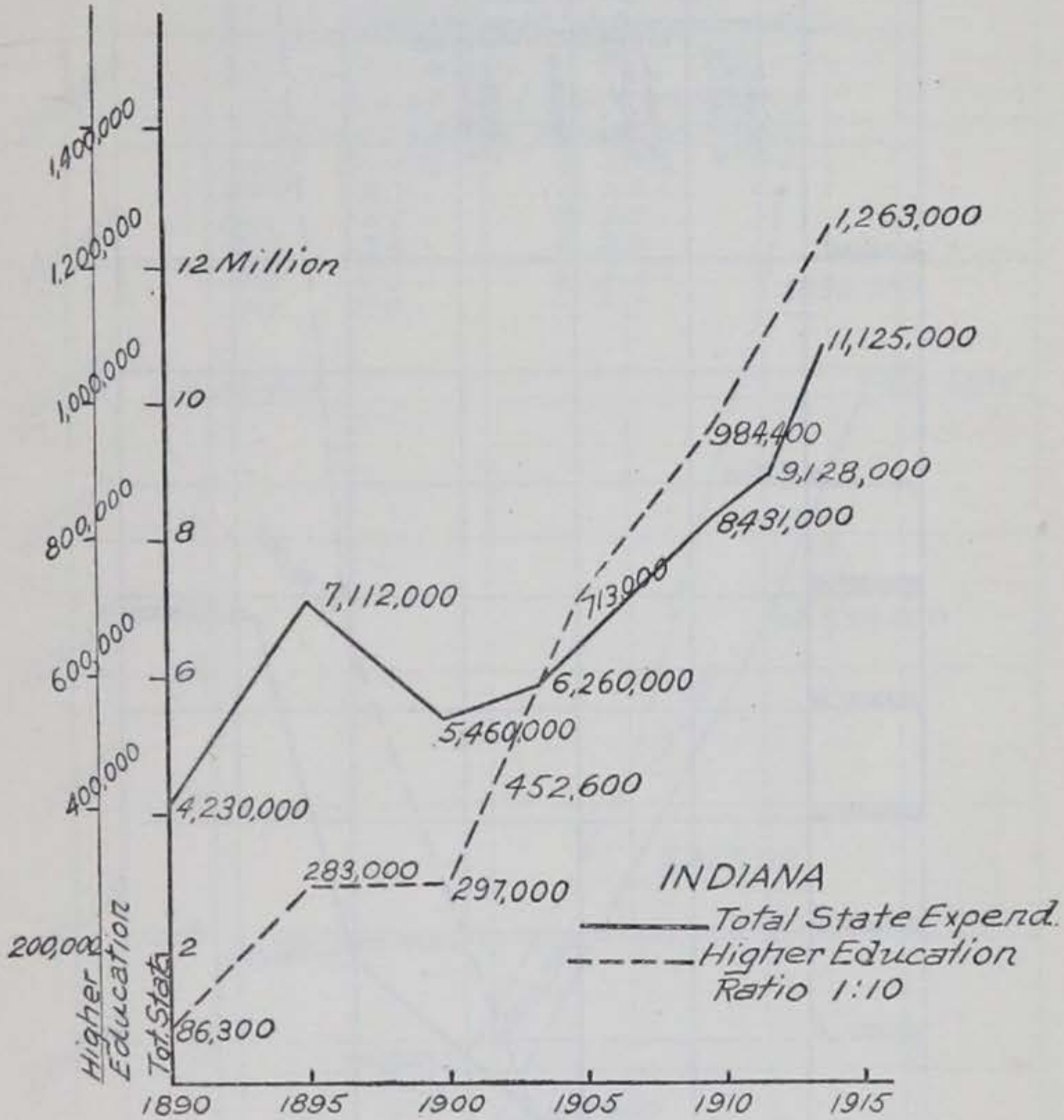
Forecast of high-school enrollment in Ohio.



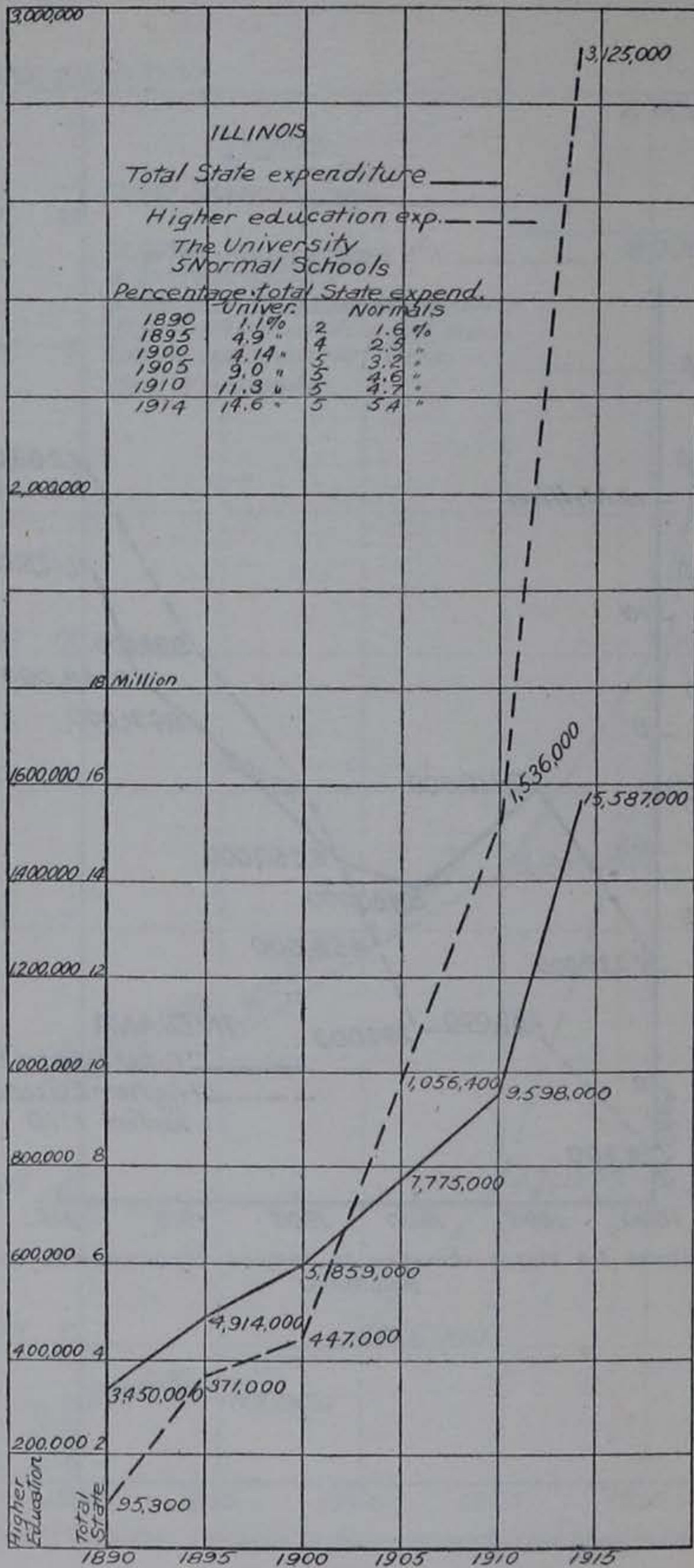
Forecast of private and State College enrollment in Ohio.



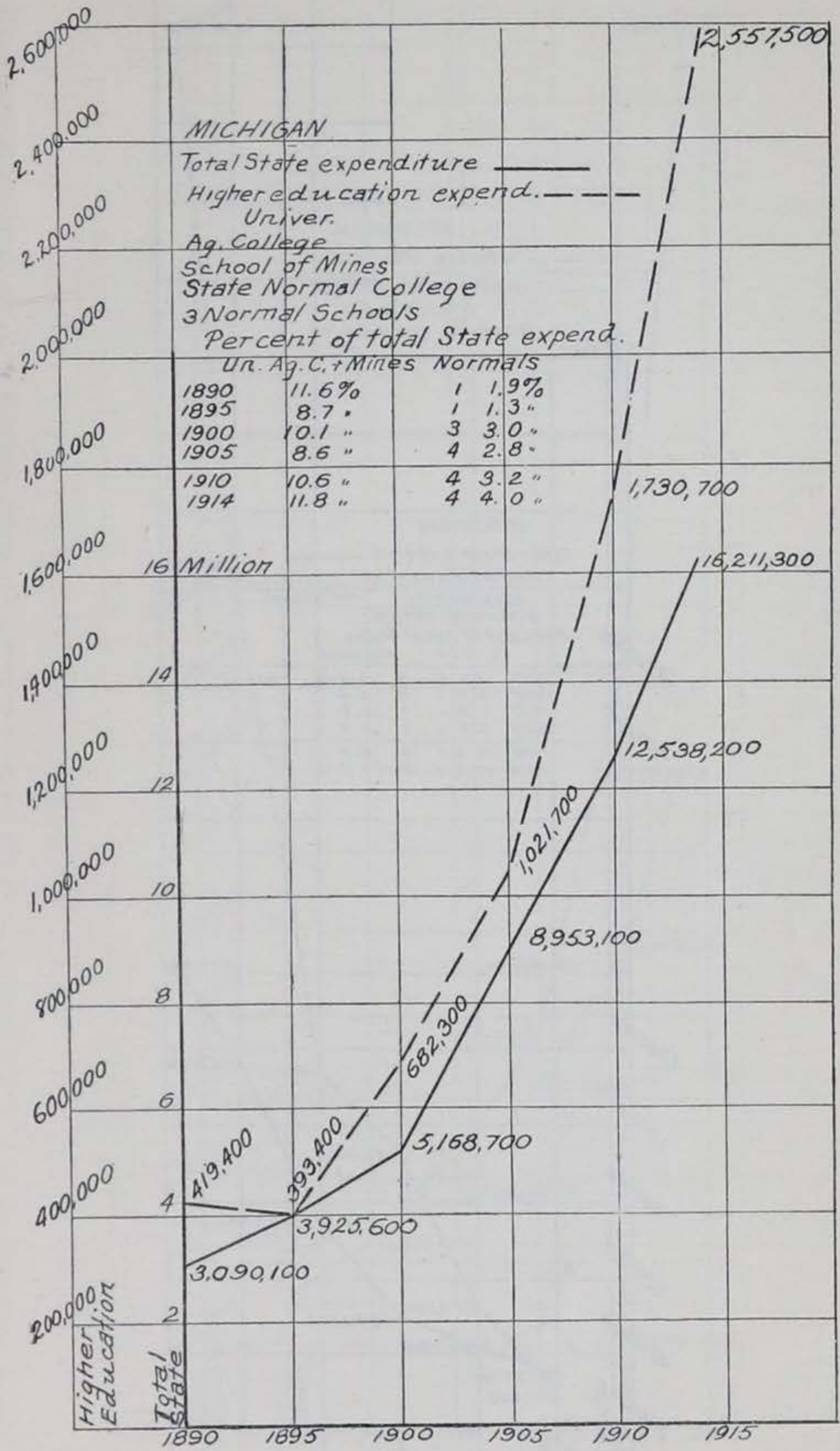
State expenditures for higher education in Ohio compared with total State expenditures.



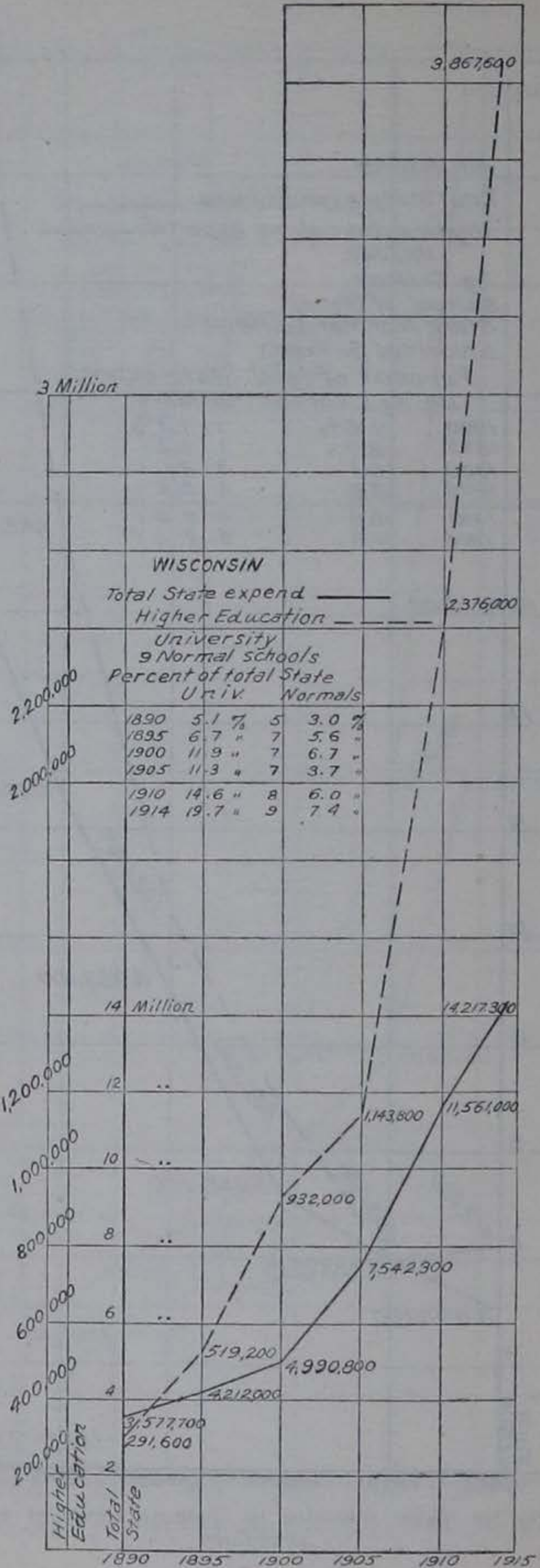
State expenditures for higher education in Indiana compared with total State expenditures.



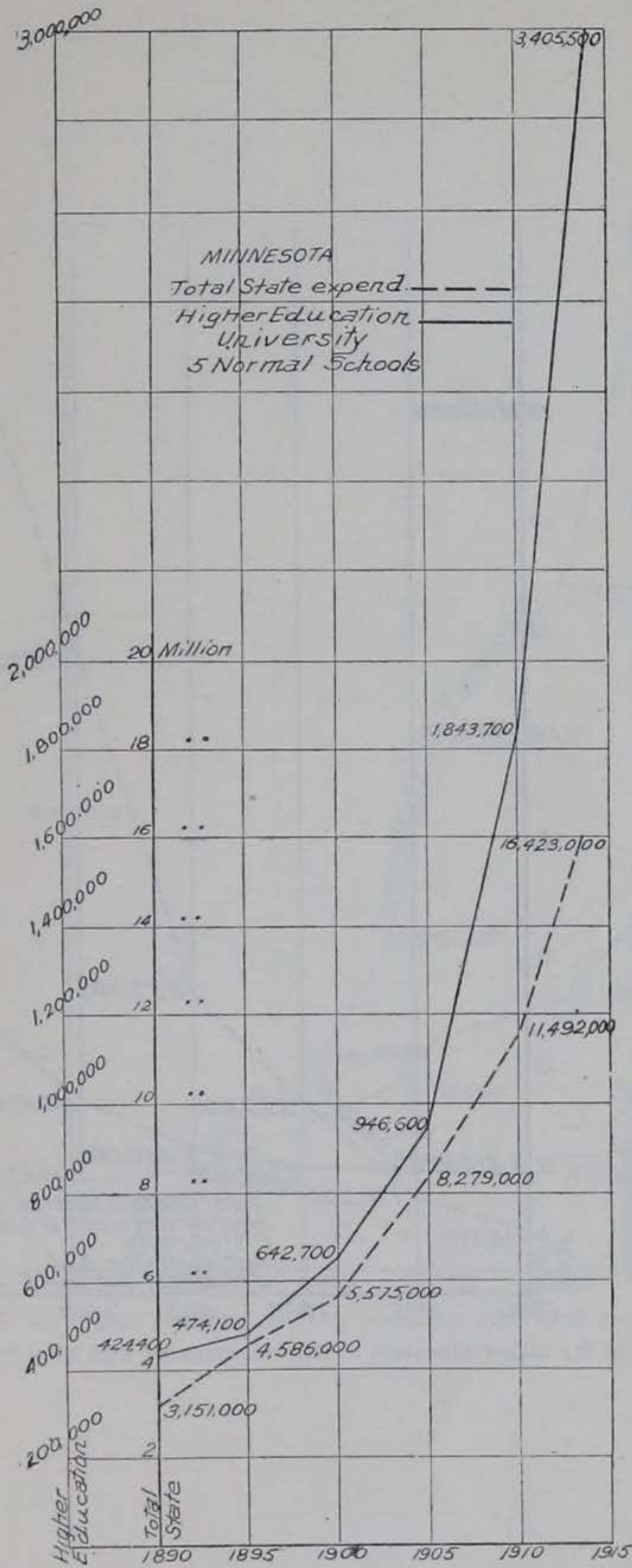
State expenditures for higher education in Illinois compared with total State expenditures.



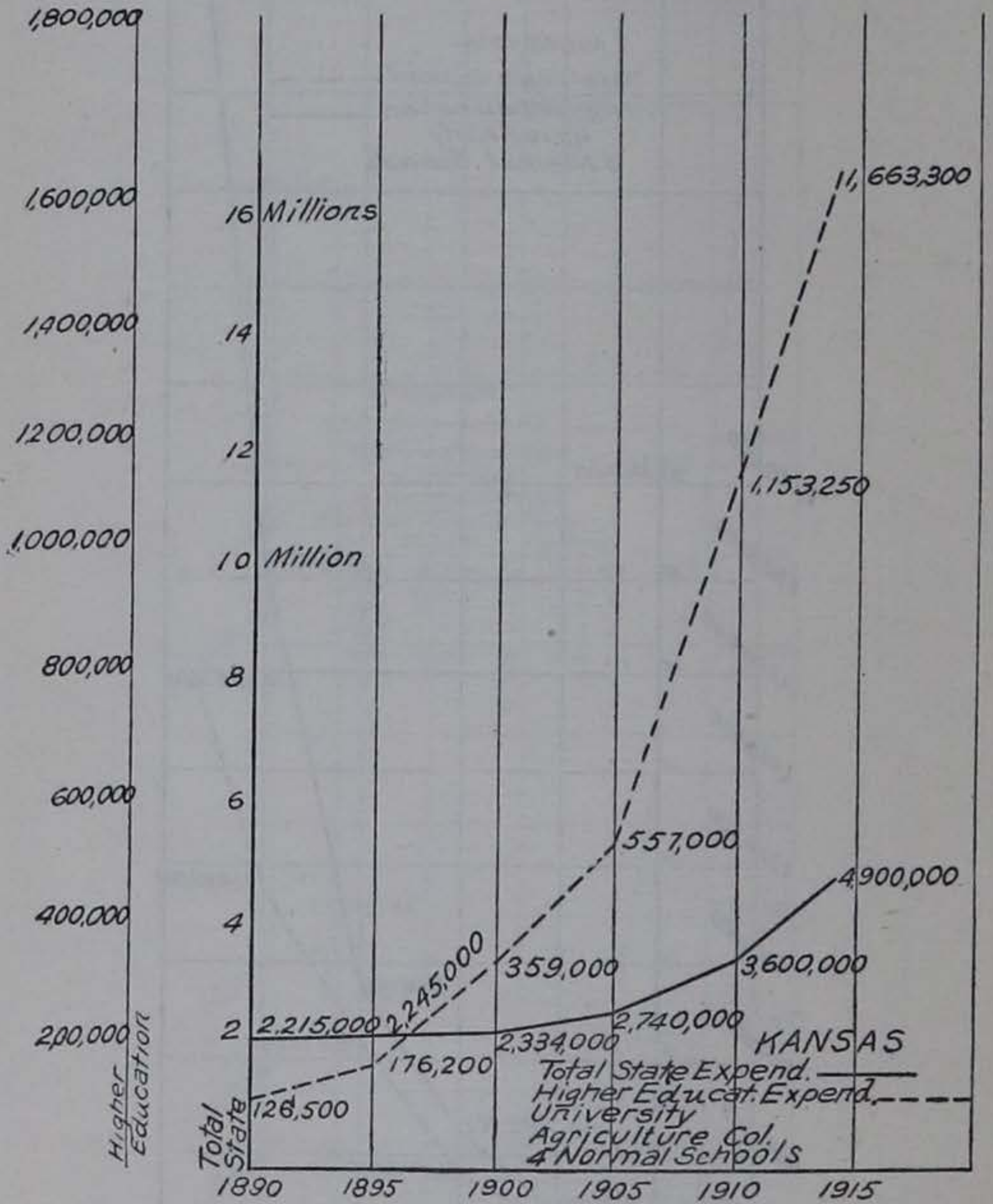
State expenditures for higher education in Michigan compared with total State expenditures.



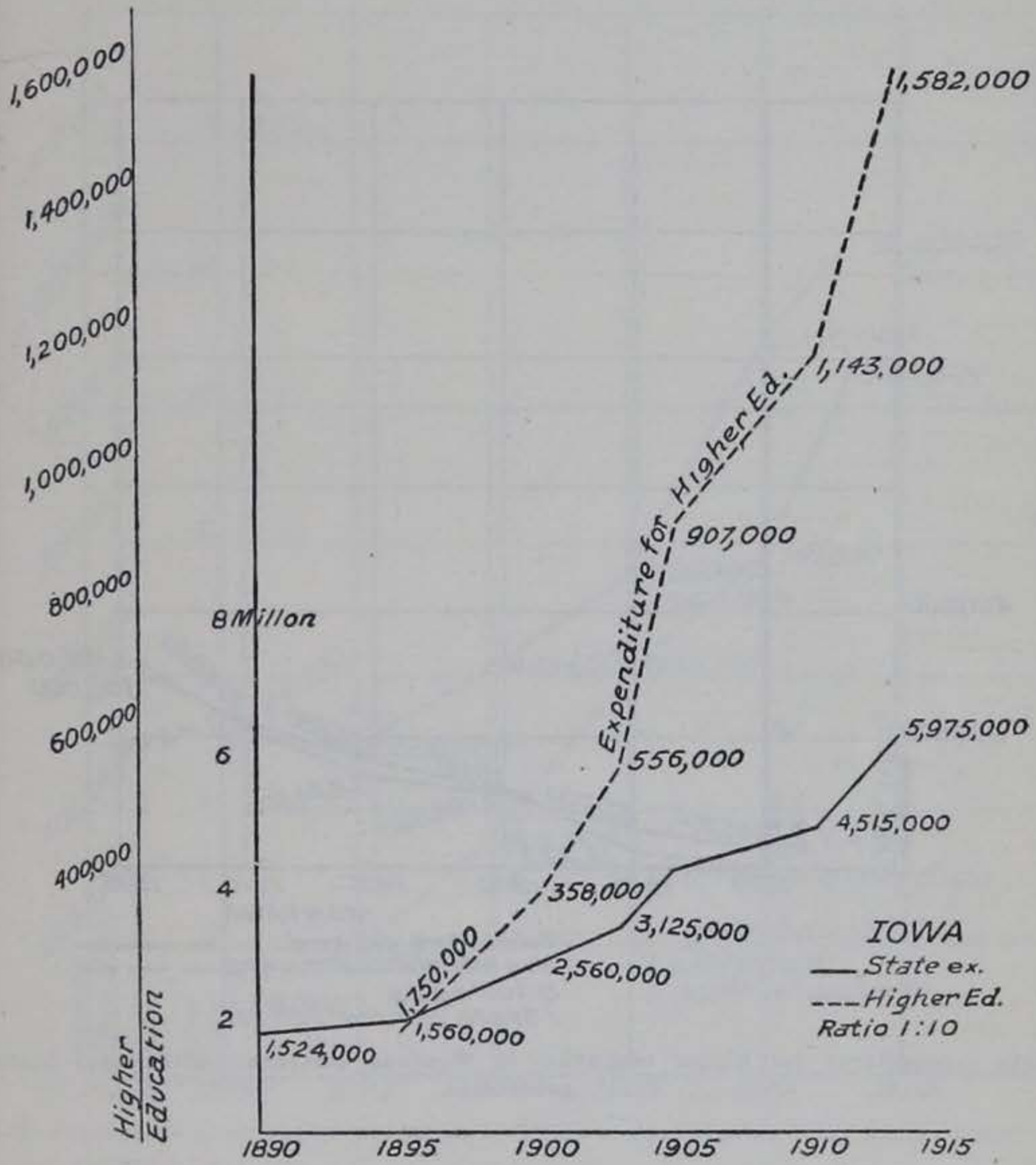
State expenditures for higher education in Wisconsin compared with total State expenditures.



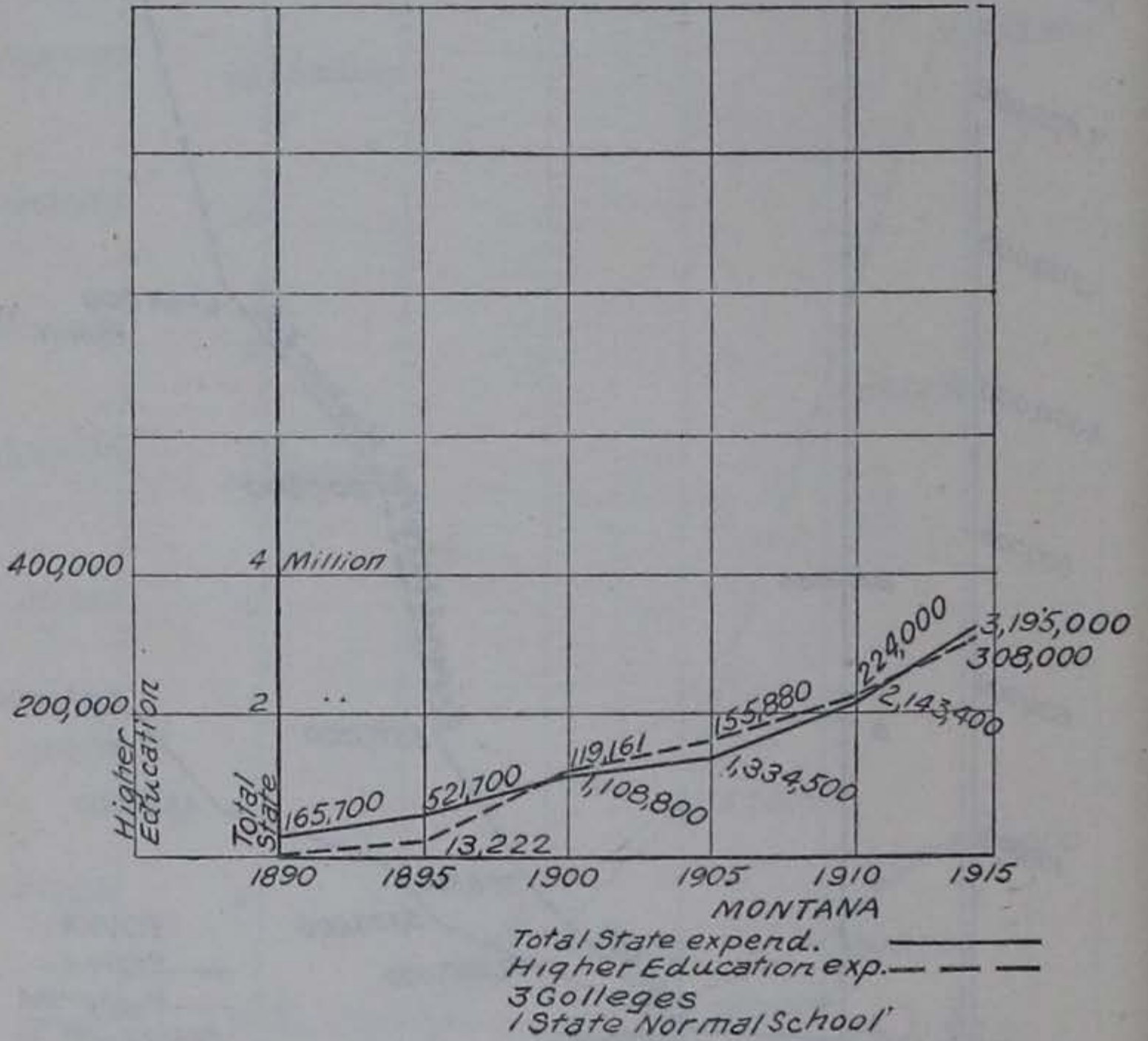
State expenditures for higher education in Minnesota compared with total State expenditures.



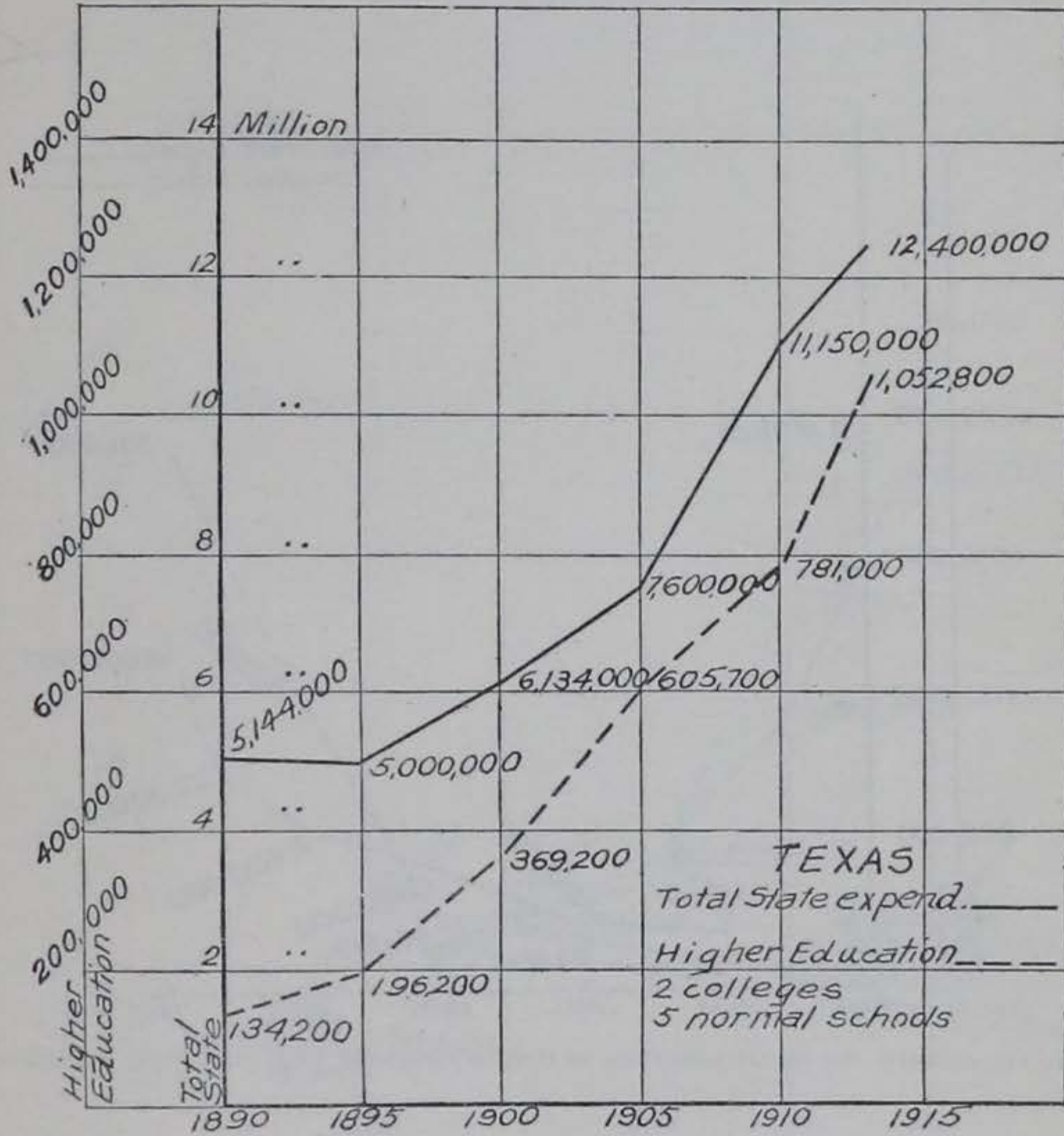
State expenditures for higher education in Kansas compared with total State expenditures.



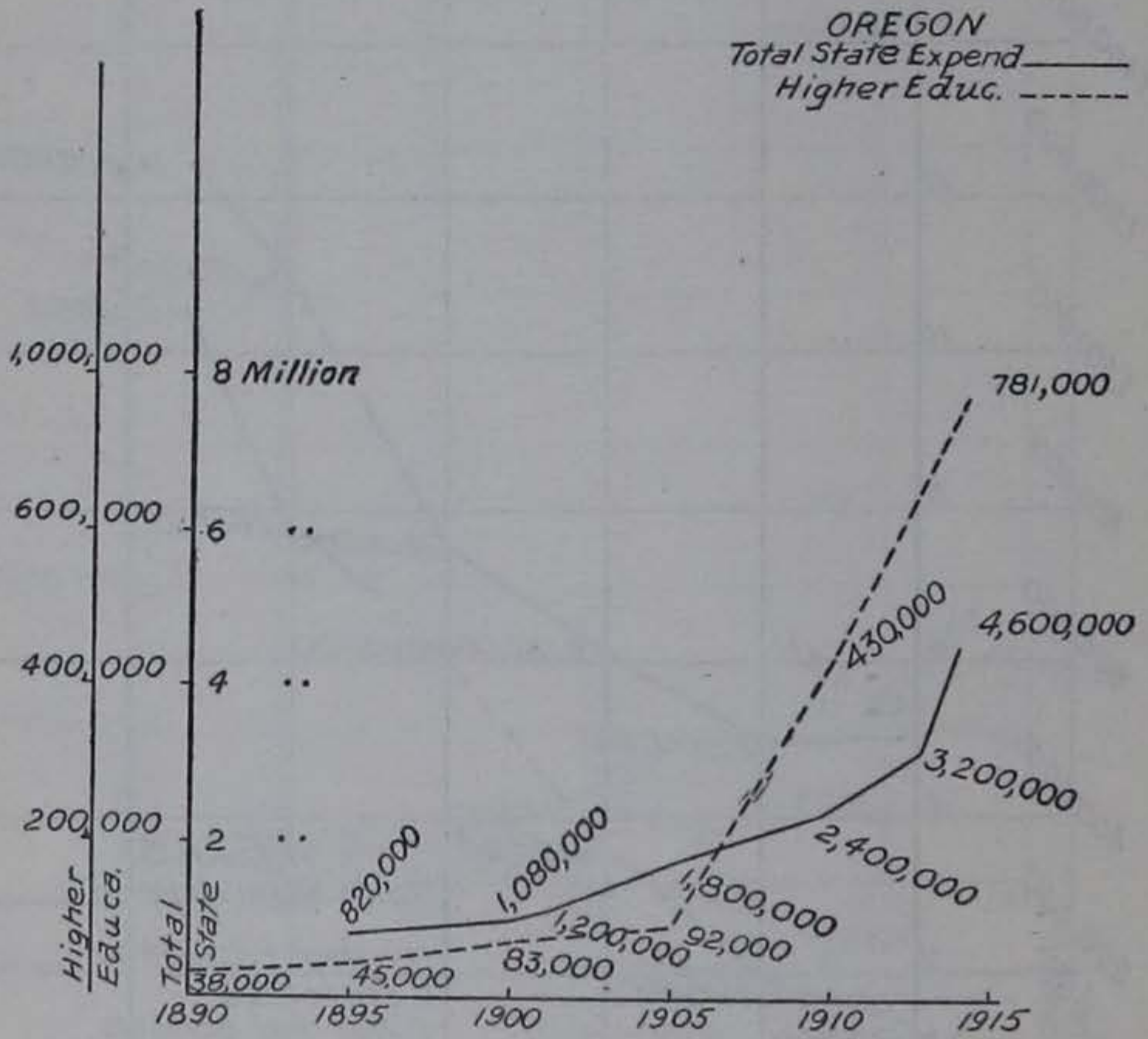
State expenditures for higher education in Iowa compared with total State expenditures.



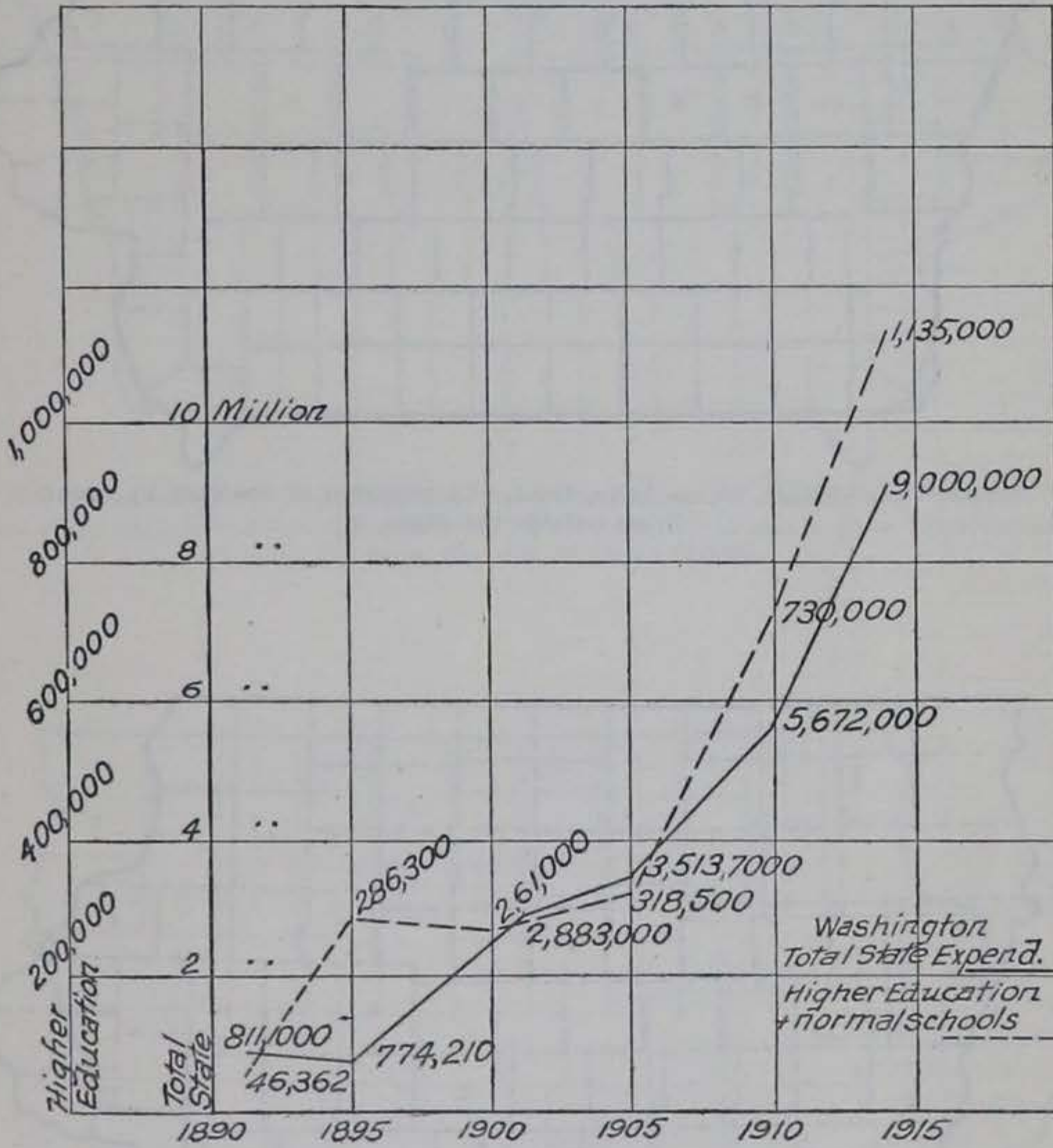
State expenditures for higher education in Montana compared with total State expenditures.



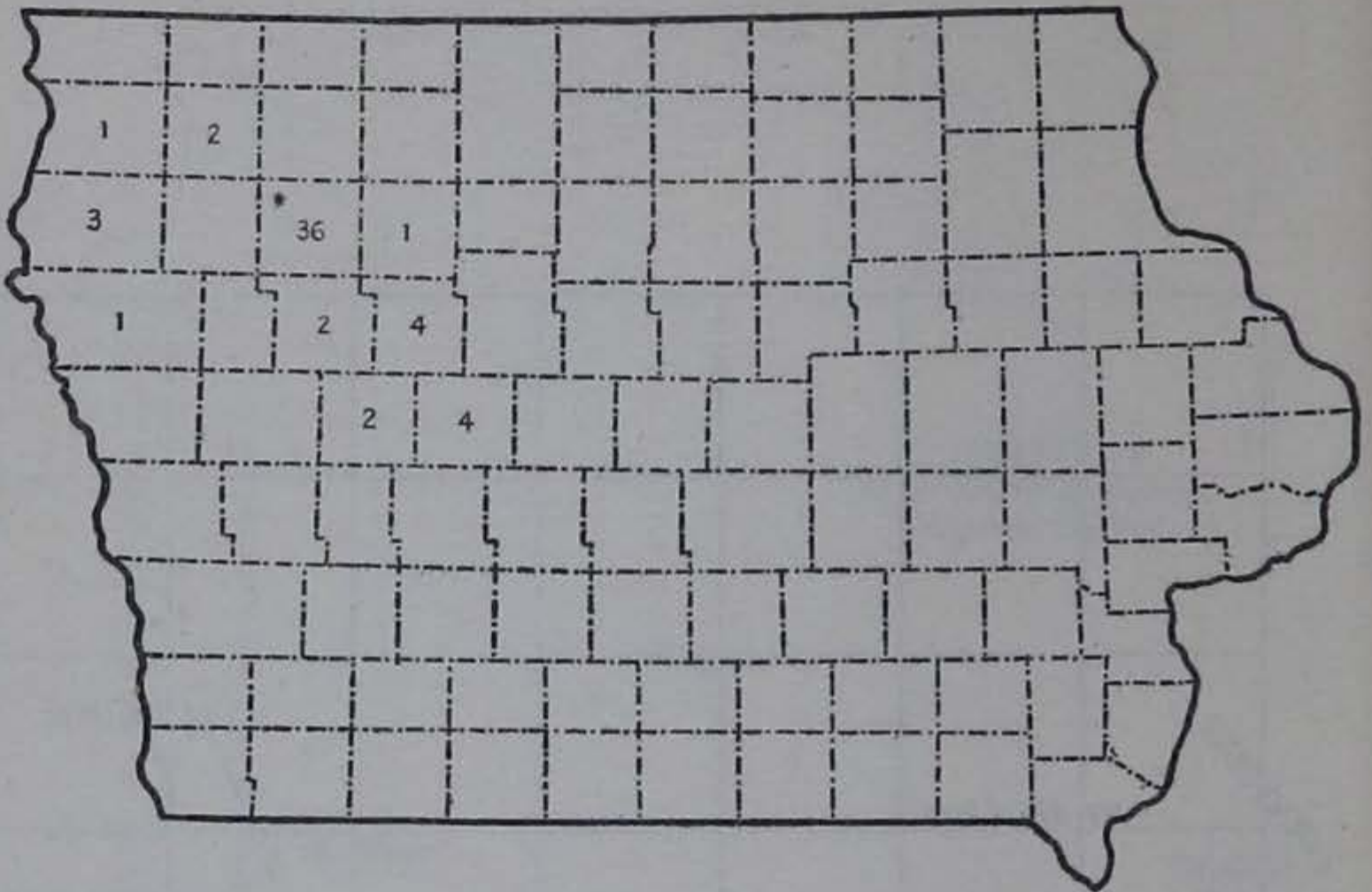
State expenditures for higher education in Texas compared with total State expenditures.



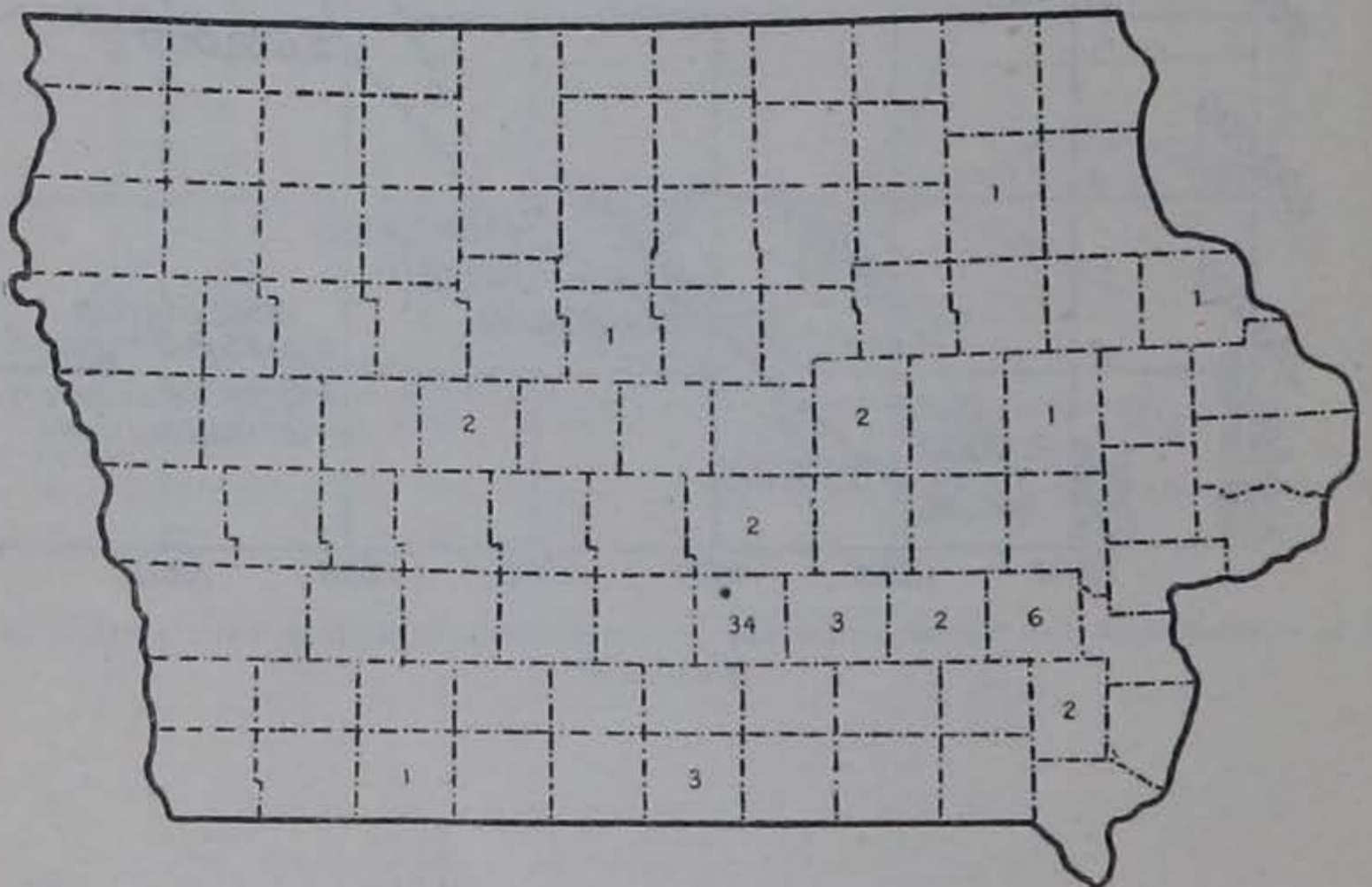
State expenditures for higher education in Oregon compared with total State expenditures.



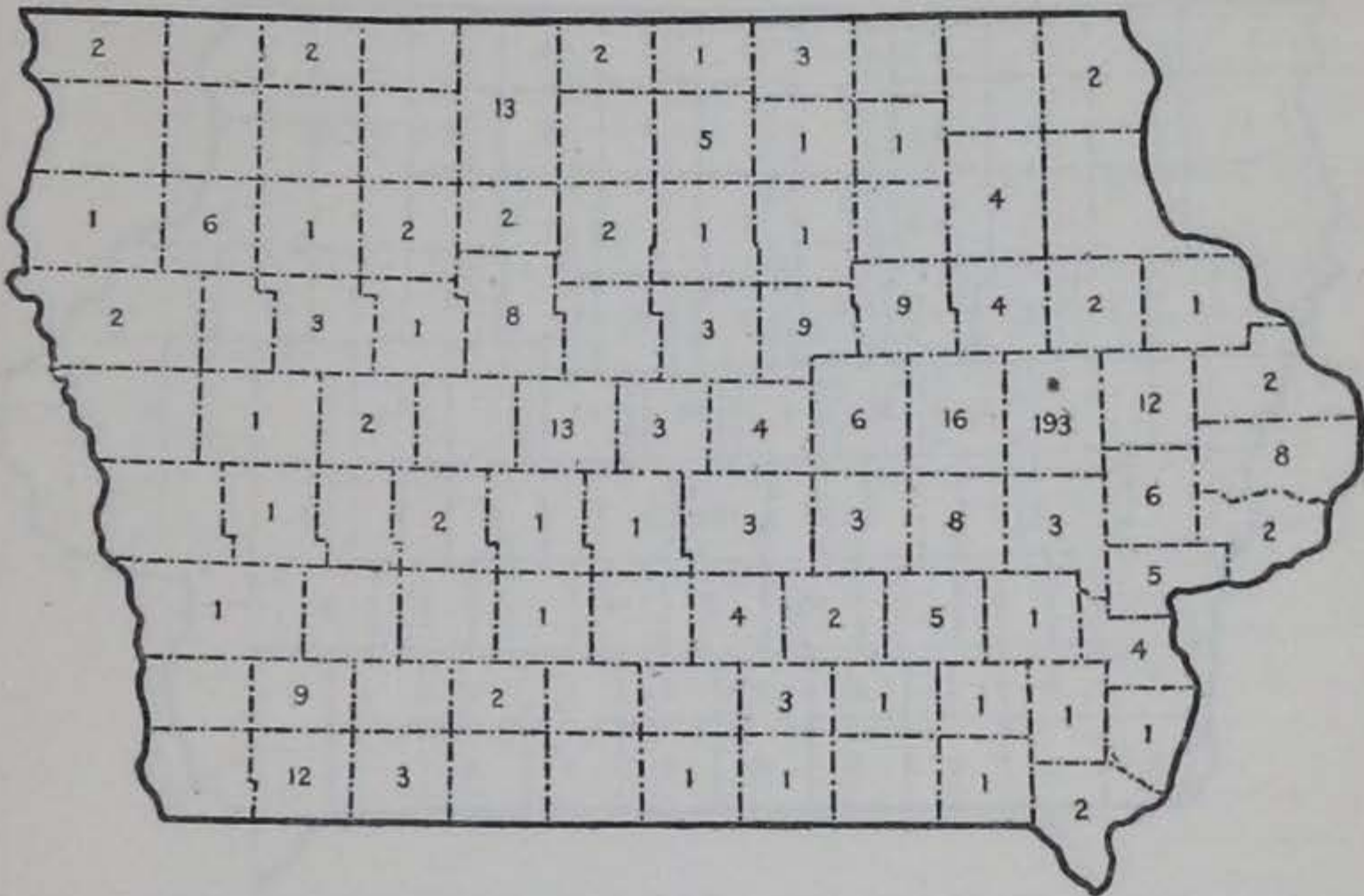
State expenditures for higher education in Washington compared with total State expenditures.



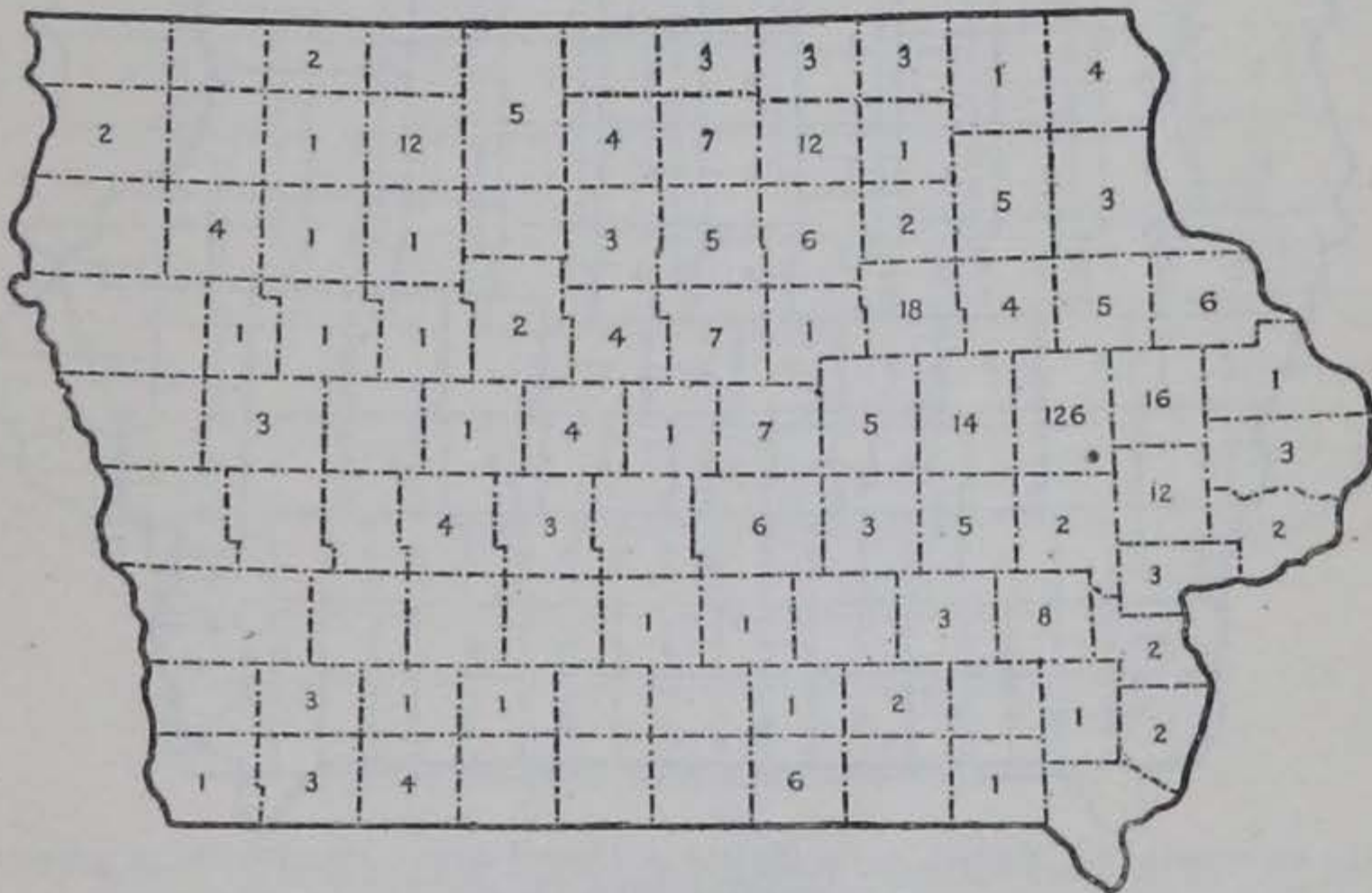
Buena Vista College, Storm Lake, Iowa. Distribution of students by counties. From outside the State, 3.



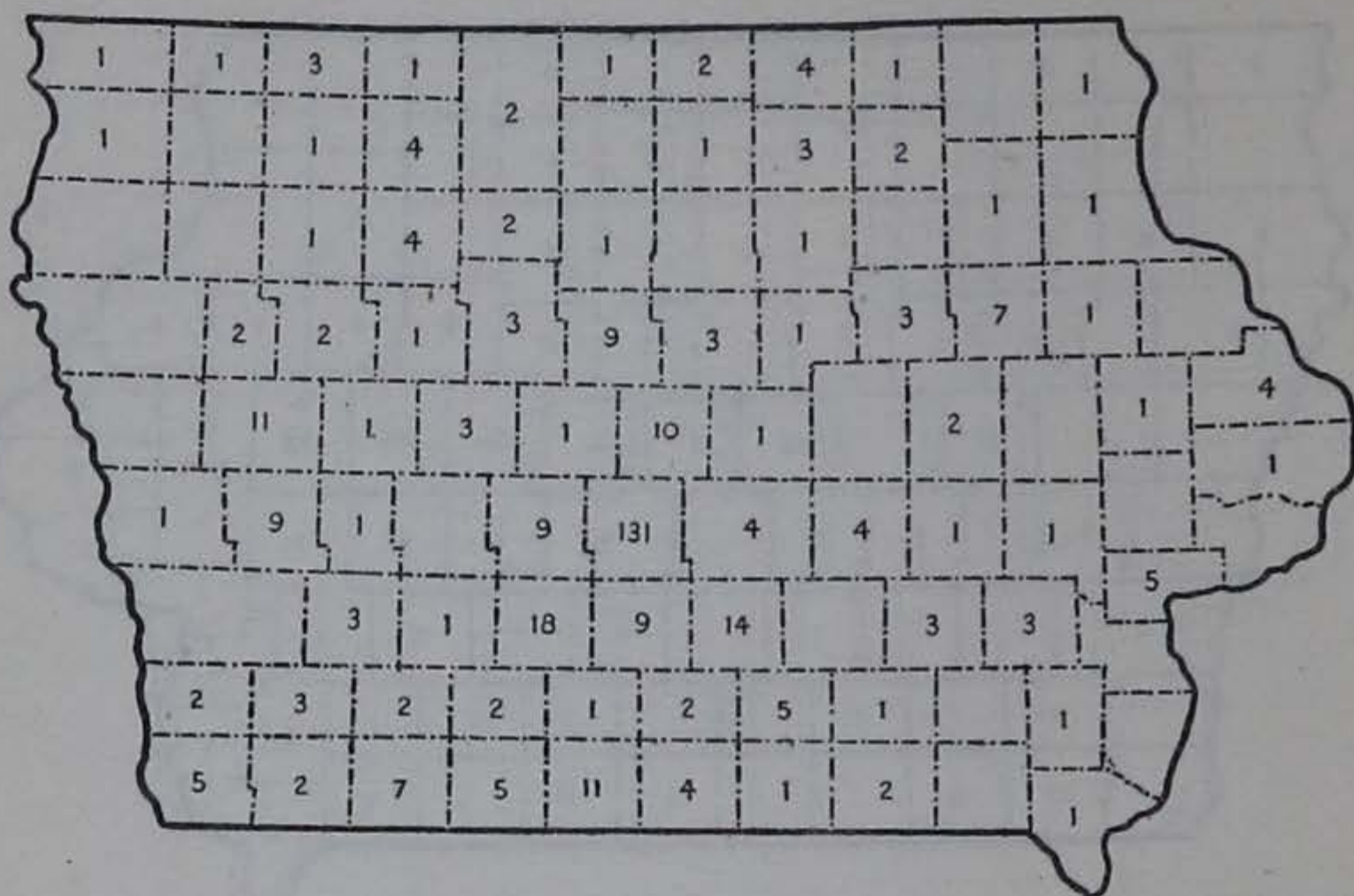
Central College, Pella, Iowa. Distribution of students by counties.



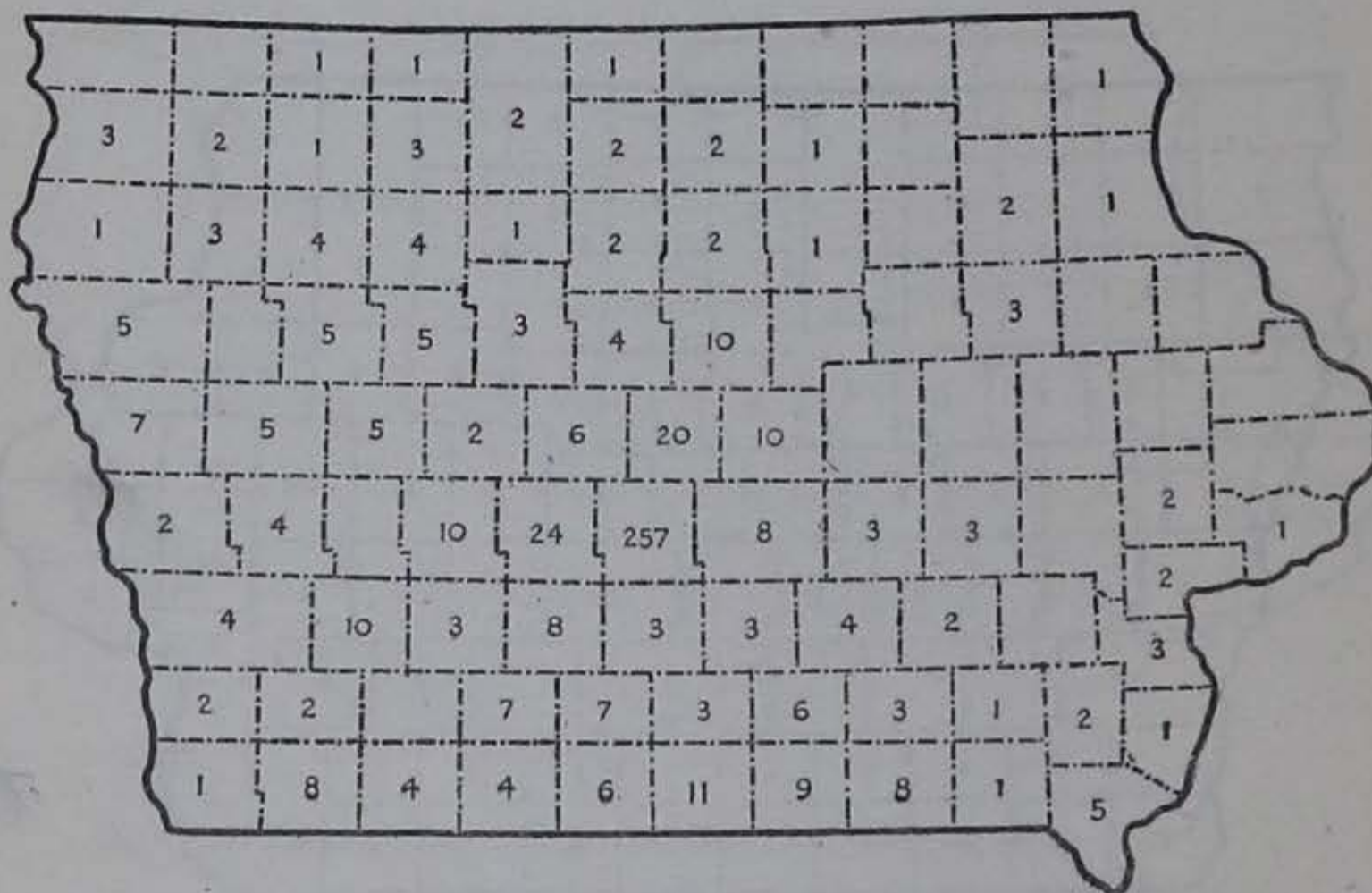
Coe College, Cedar Rapids, Iowa. Distribution of students by counties. From other States, 41; foreign countries, 15. Of the 193 students from Linn County 156 are from the city of Cedar Rapids.



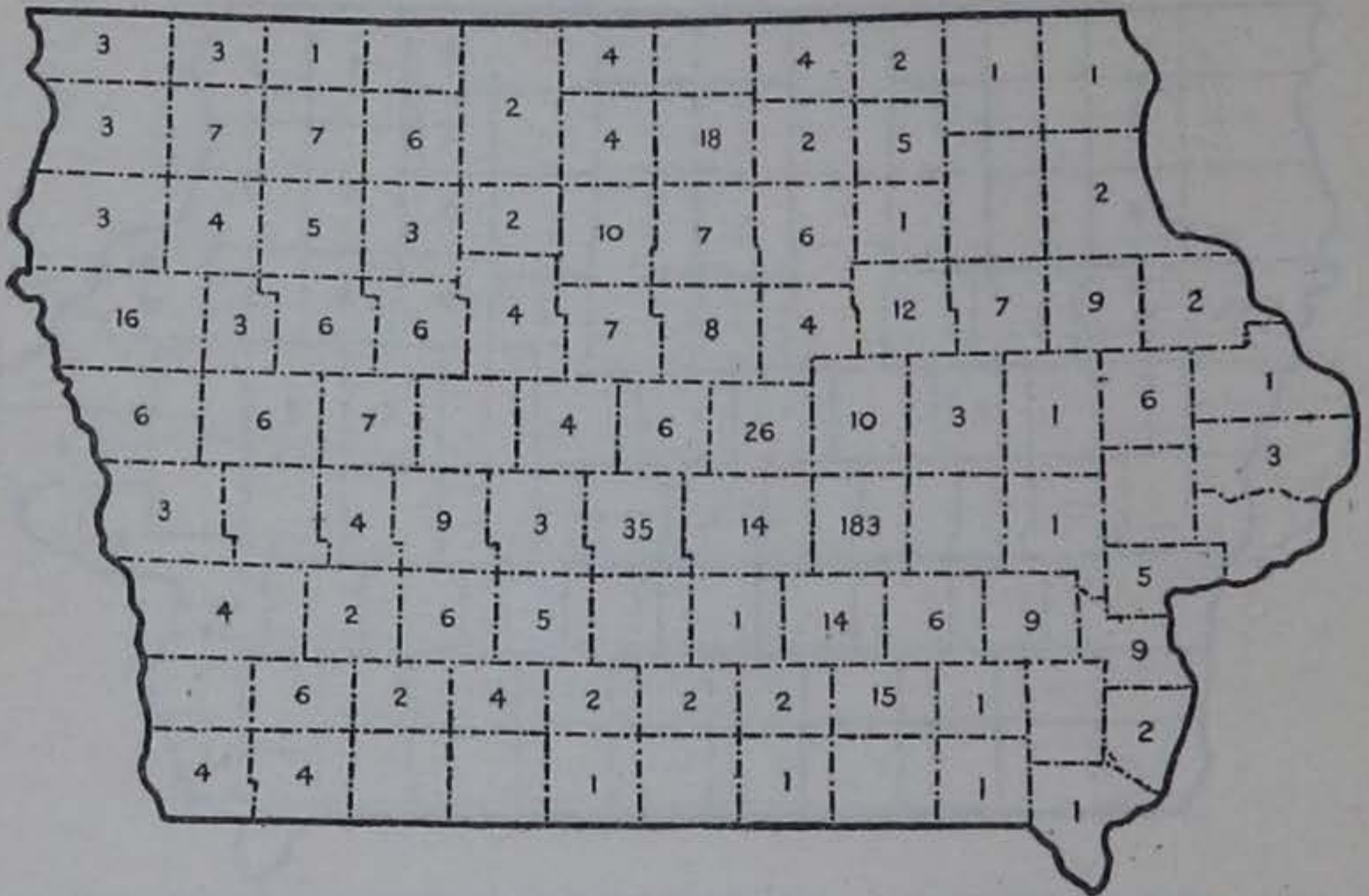
Cornell College, Mt. Vernon, Iowa. Distribution of students by counties. From Iowa, 419; from outside the State, 101. Of the non-State students, 46 were from Illinois.



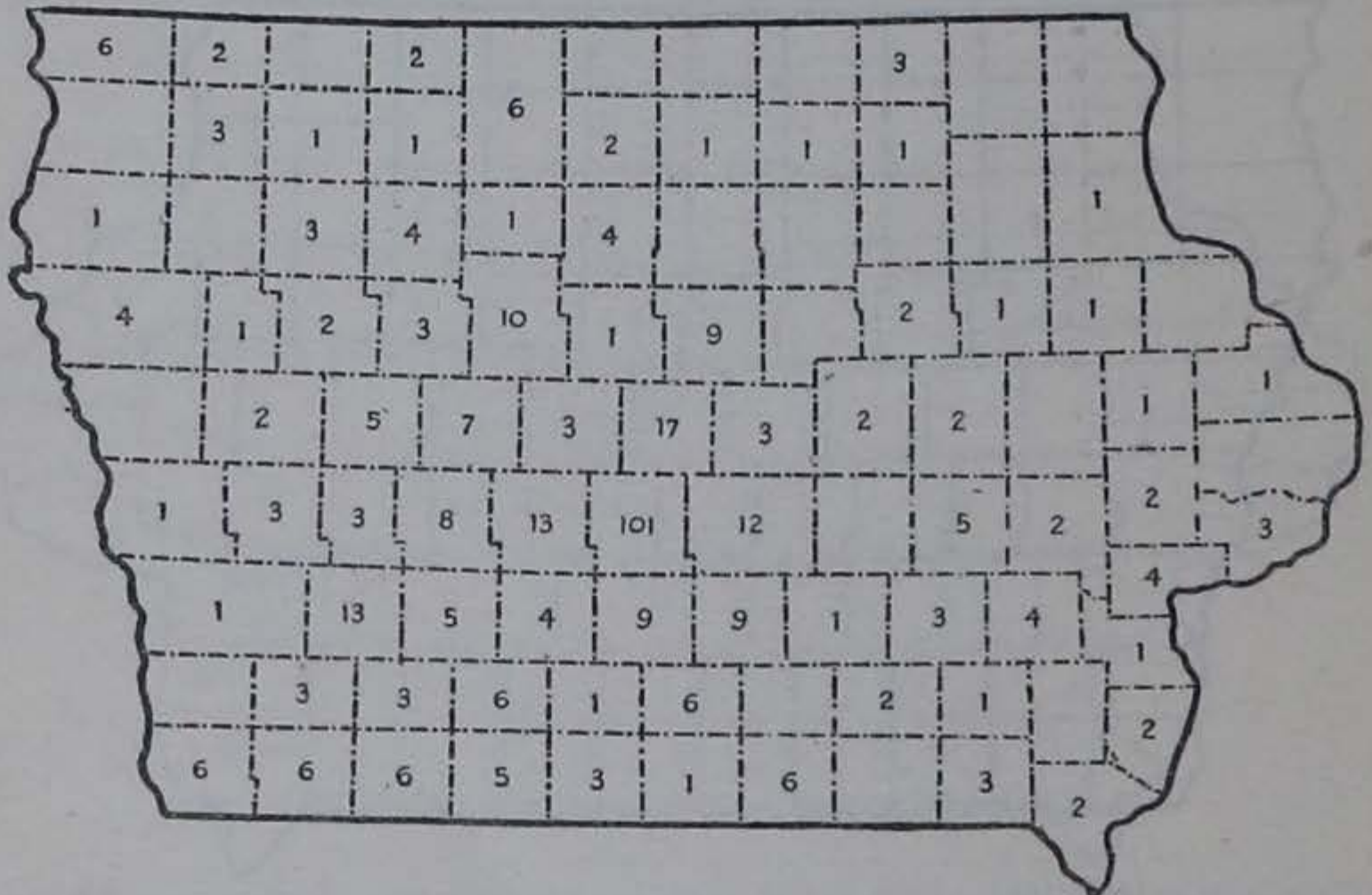
Des Moines College, Des Moines, Iowa. Distribution of students by counties, 1915-16.
From Iowa, 381 ; from outside the State, 25.



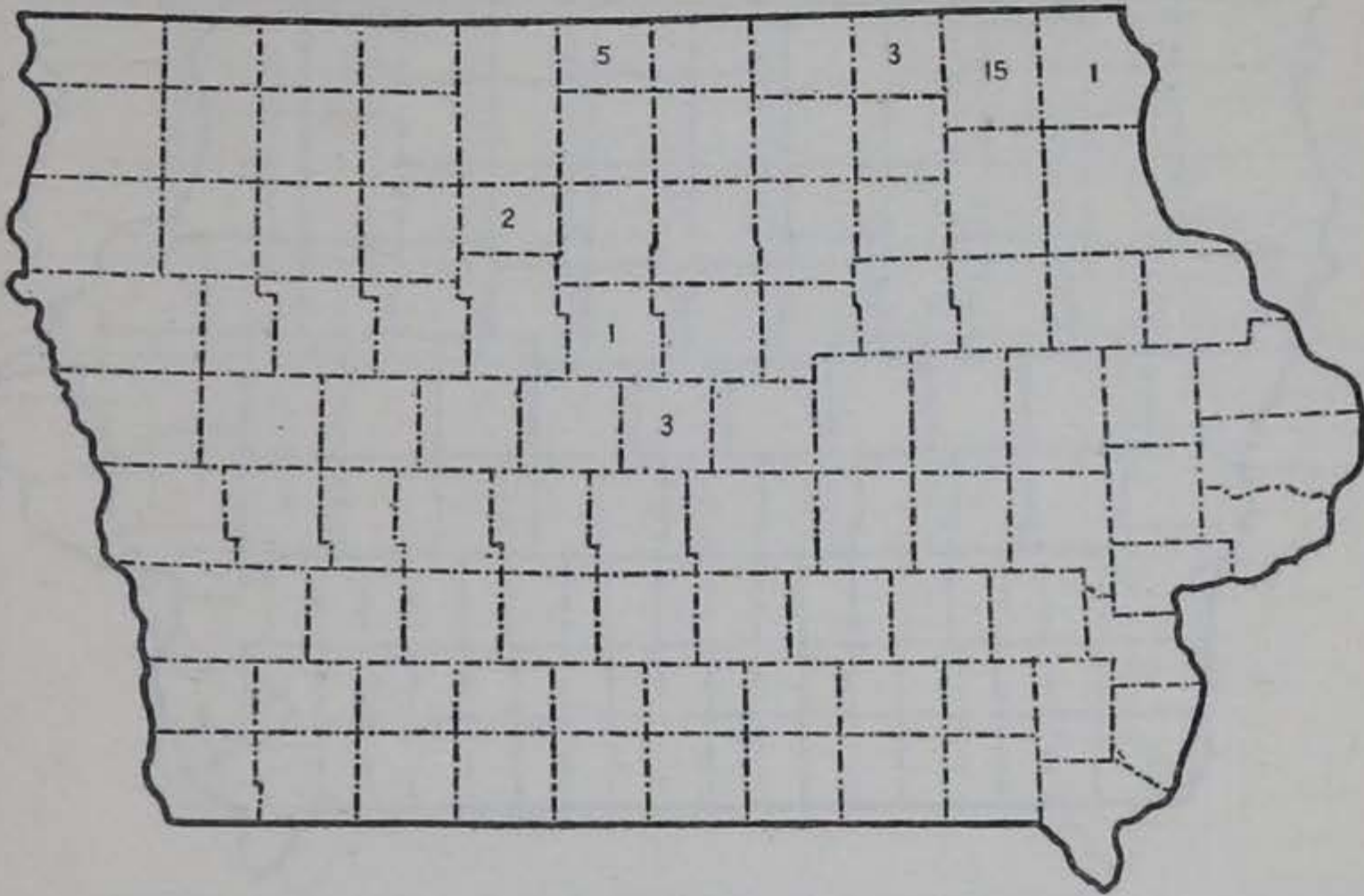
Drake University, Des Moines, Iowa, College of Liberal Arts. Distribution of students by counties, 1914-15.
From Iowa, 580 ; from outside the State, 107 ; total, 687.



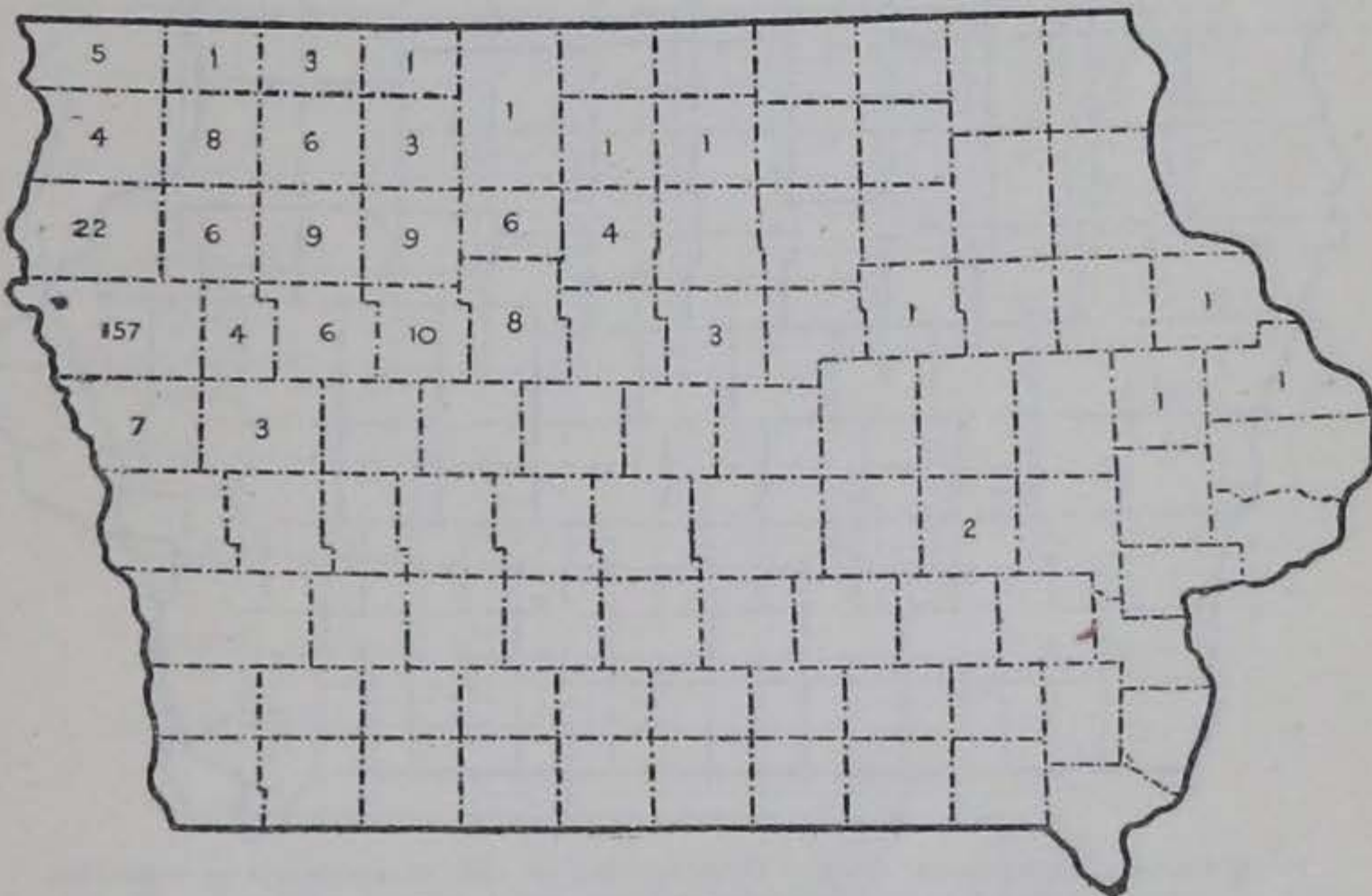
Grinnell College, Grinnell, Iowa. Distribution of students by counties.
From 19 other States, 57; from foreign countries, 3.



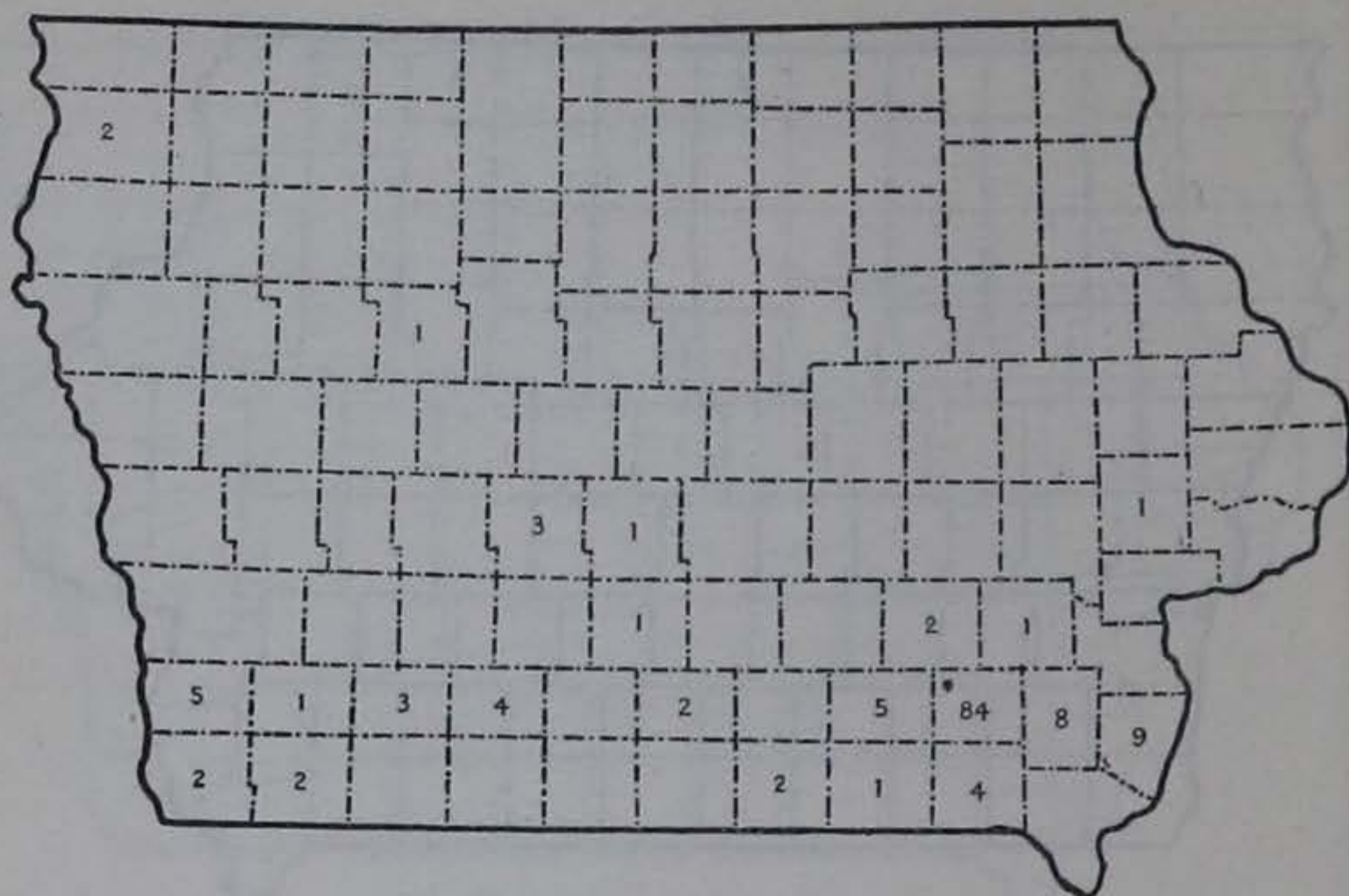
Highland Park College, Des Moines, Iowa. Distribution of college students by counties,
1914-15.
From 31 other States, 149; from foreign countries, 19.



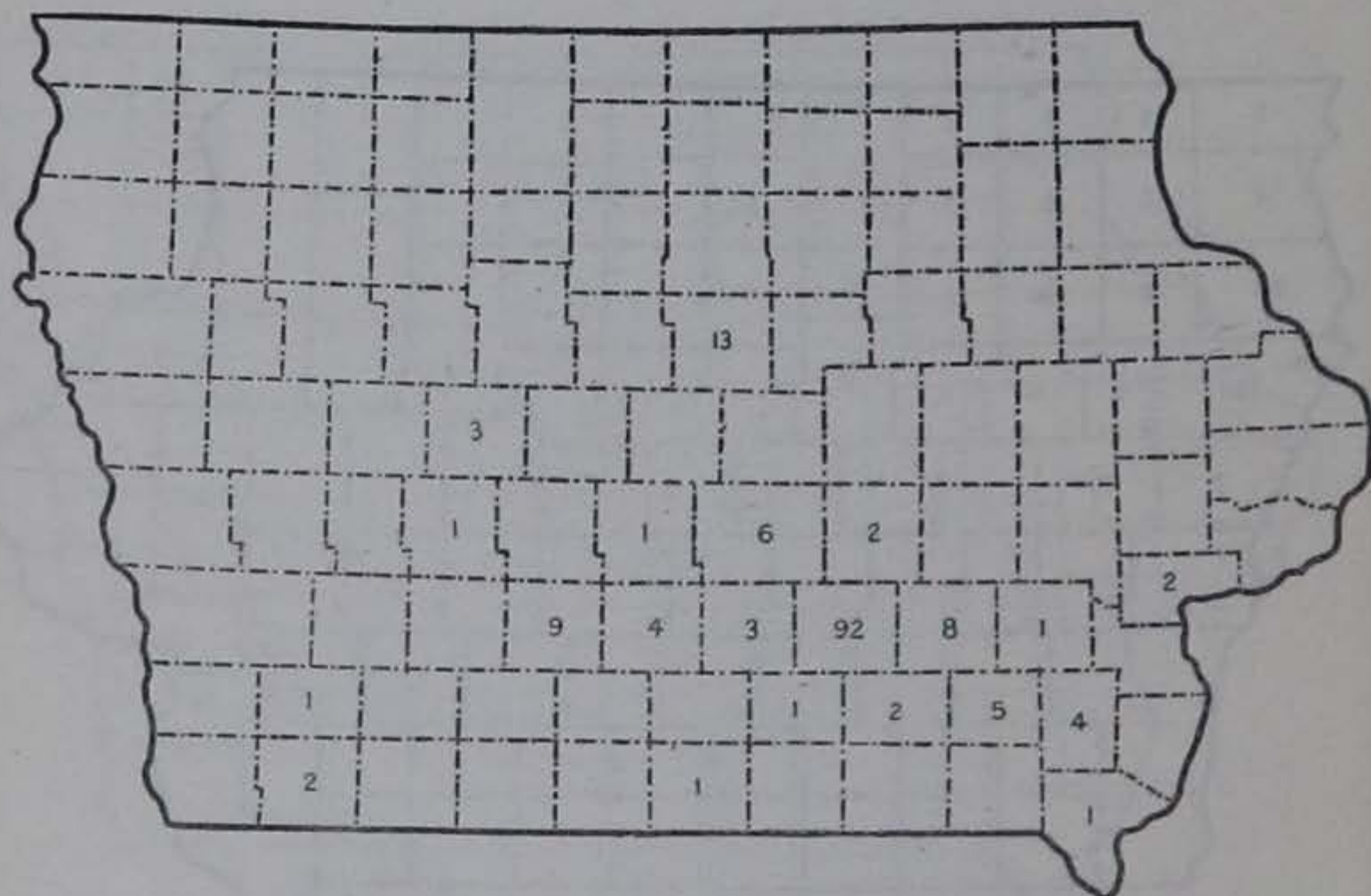
Luther College, Decorah, Iowa (Collegiate Department). Distribution of students by counties, 1915-16.
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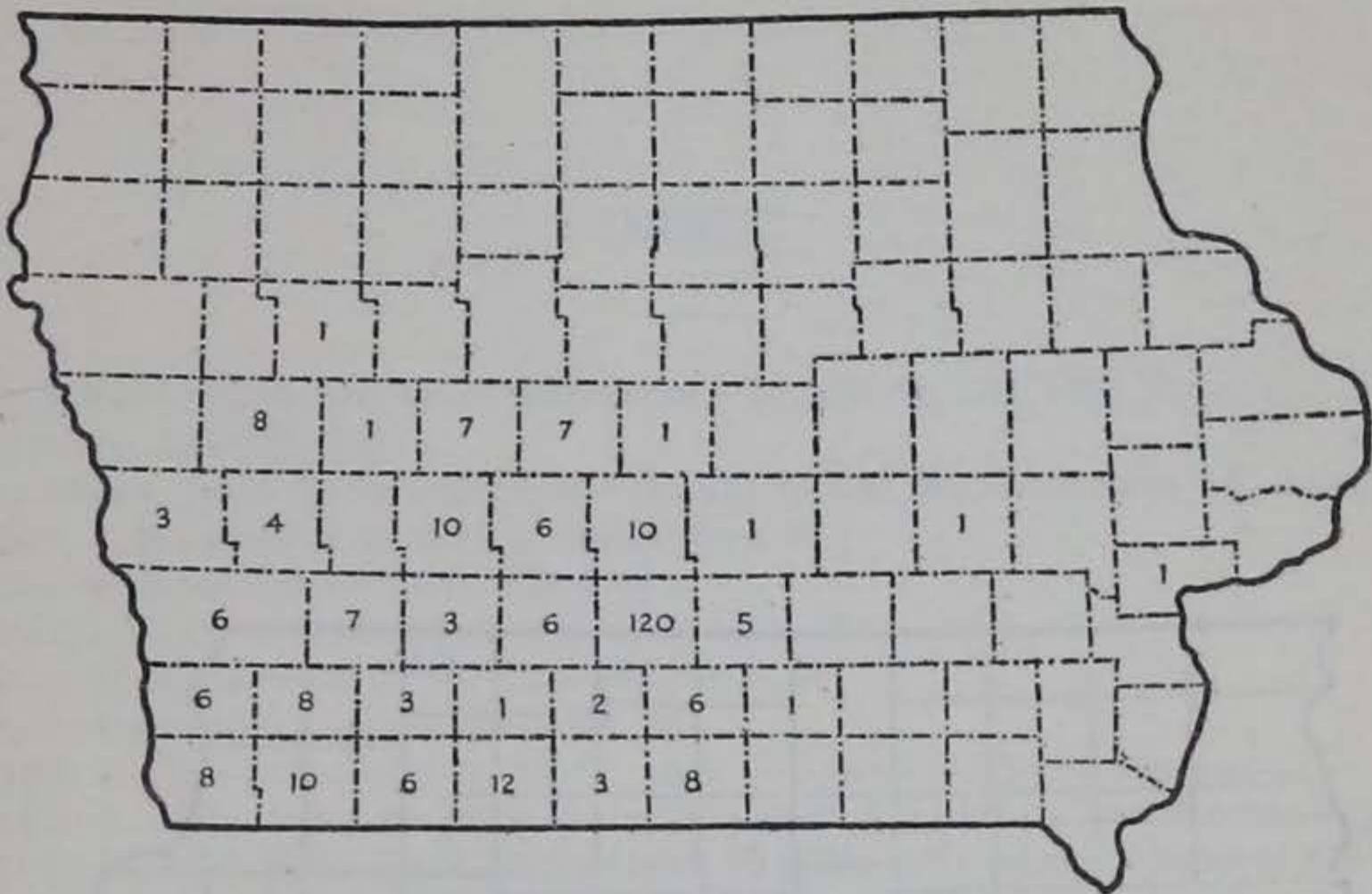
Morningside College, Sioux City, Iowa. Distribution of students by counties.
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Parsons College, Fairfield, Iowa. Distribution of students by counties.
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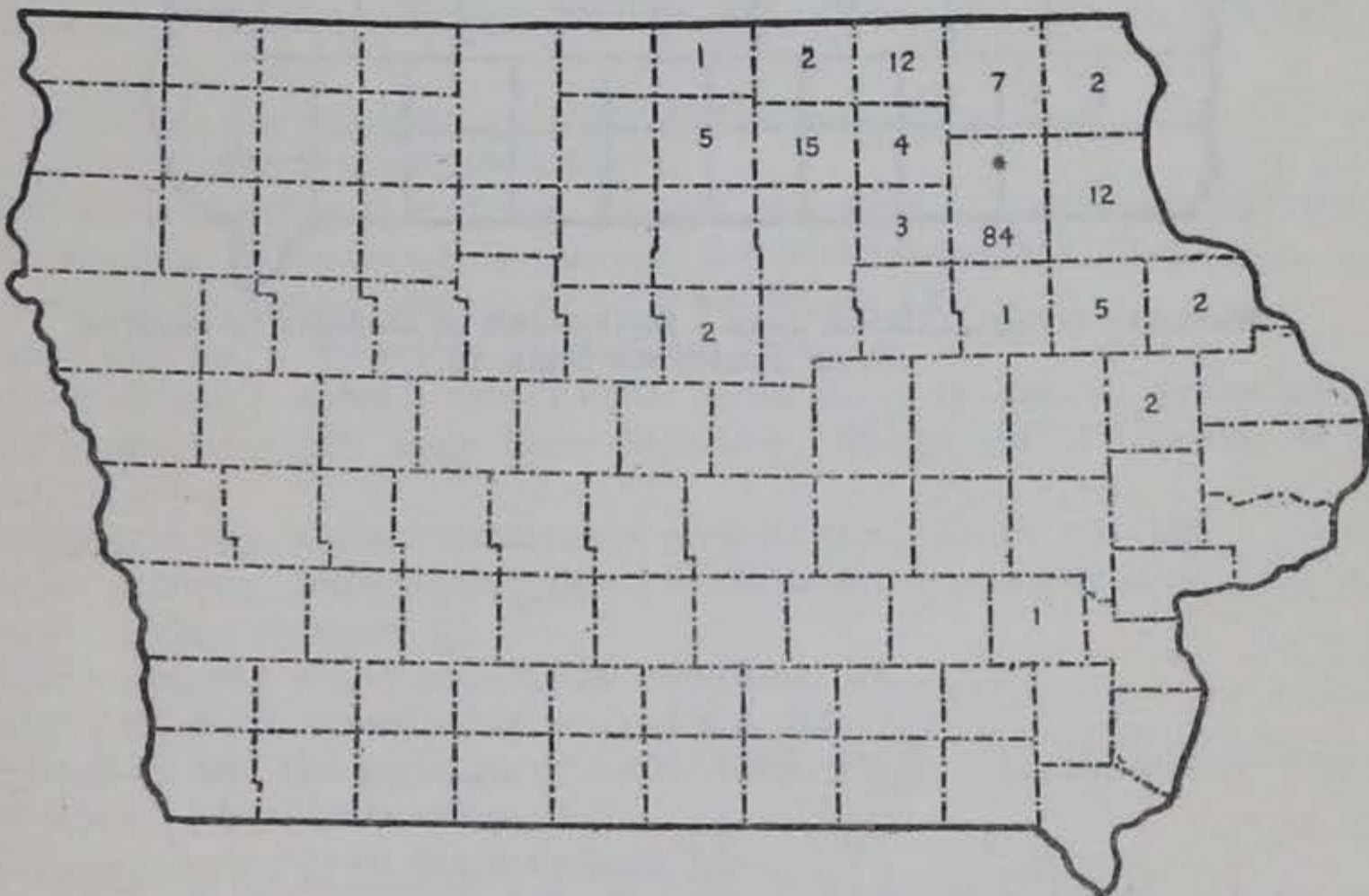


Penn College, Oskaloosa, Iowa. Distribution of college students by counties.
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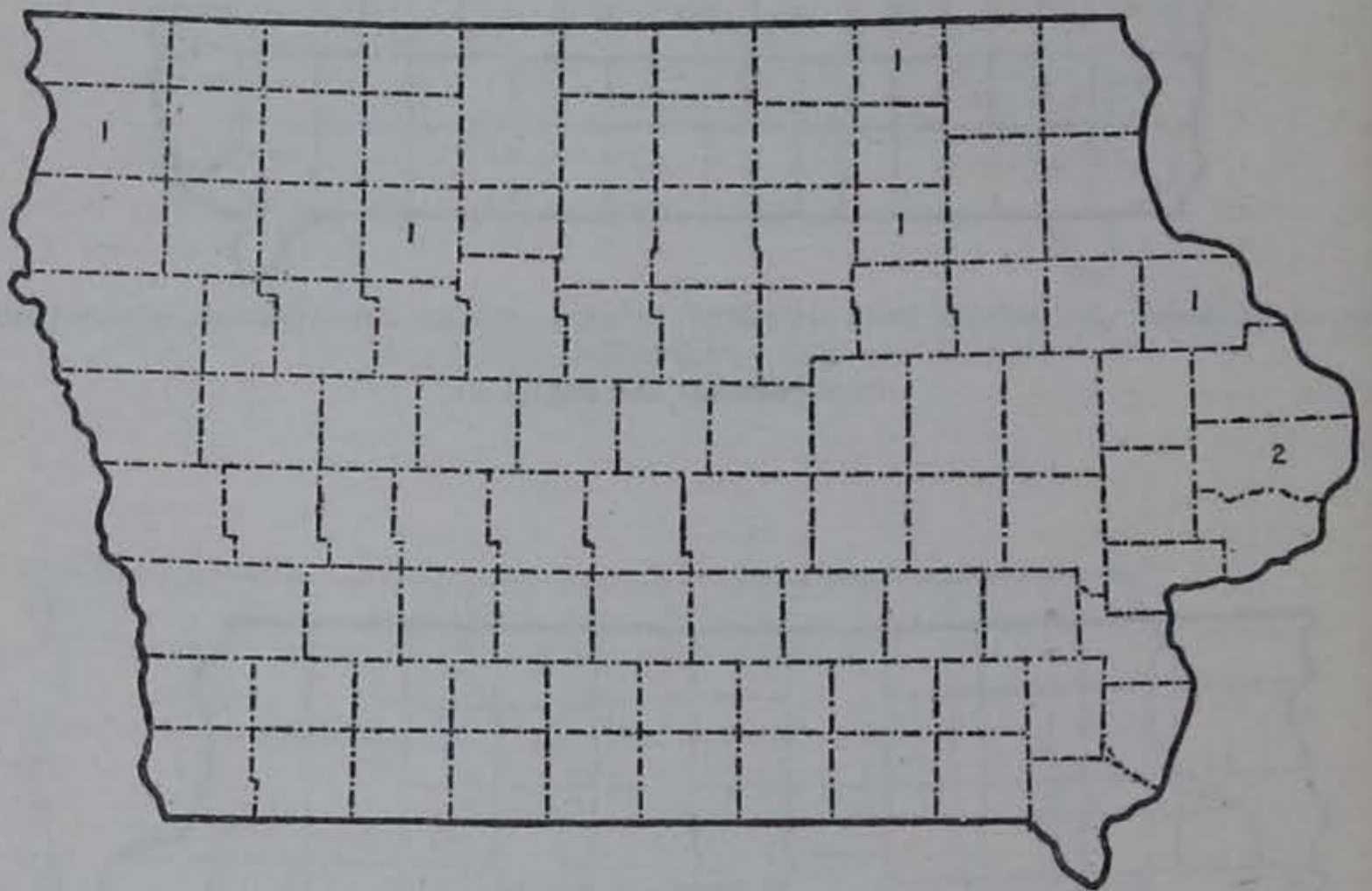
Simpson College, Indianola, Iowa (College Liberal Arts). Distribution of students by counties.

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