DEPARTMENT OF THE INTERIOR
BUREAU OF EDUCATION

BULLETIN, 1916, No. 27

STATE HIGHER EDUCATIONAL INSTITUTIONS OF NORTH DAKOTA

A REPORT TO THE NORTH DAKOTA STATE BOARD OF REGENTS OF A SURVEY MADE UNDER THE DIRECTION OF THE UNITED STATES COMMISSIONER OF EDUCATION

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DEPARTMENT OF THE INTERIOR,
BUREAU OF EDUCATION,
Washington, November 25, 1916.

SIR: I am transmitting herewith for publication as a bulletin of the Bureau of Education the manuscript of the report of a survey of the system of higher education of the State of North Dakota, including the University of North Dakota; the North Dakota Agricultural College; the normal schools at Mayville, Valley City, and Minot; the Normal and Industrial School at Ellendale; the School of Science at Wahpeton; the School of Forestry at Bottineau; and the State Library Commission, which has its offices in the Capitol at Bismarck. The survey has been made, as stated in the body of the report, under my direction and at the request of the State board of regents. The investigations in the field were made by Dr. William T. Bawden, the bureau's specialist in vocational education; Dr. Edwin B. Craighead, formerly president of the University of Montana, employed by the board of regents; and Dr. Lotus D. Coffman, dean of education of the University of Minnesota, serving at my request.

In this report no attempt has been made to appraise the ability of any individual teacher, the work of any department, or the contents of any particular course of study; only the spheres and functions of the several institutions have received primary consideration.

Respectfully submitted.

P. P. CLAXTON,
Commissioner.

The SECRETARY OF THE INTERIOR.

INTRODUCTORY.

PERSONNEL OF THE SURVEY COMMISSION.

Under date of August 4, 1916, President Lewis F. Crawford, of the North Dakota Board of Regents, addressed a letter to Commissioner Claxton, inquiring whether it would be possible for him to detail one or more members of the staff of the Bureau of Education to assist the board in making "a survey of the State educational institutions," as required by a law recently enacted by the State legislature. After considerable correspondence, the Commissioner of Education notified the board of regents on October 6 that he had assigned to the work of the North Dakota survey Dr. William T. Bawden, specialist in industrial education, of the bureau staff.

On October 20 Secretary Charles Brewer announced that the board of regents had employed Dr. Edwin B. Craighead, formerly president of the University of Montana, to assist in the work of the survey.

After conferring with officers of the board of regents in Bismarck, N. Dak., on November 1, Commissioner Claxton accepted the invitation to have the survey conducted under the direction of the Commissioner of Education. The board of regents authorized the commissioner to select an additional member to assist in the work.

On December 24 Commissioner Claxton announced the appointment of Prof. Lotus D. Coffman, dean of the college of education, University of Minnesota, to serve as the third member of the survey commission.

SUMMARY OF INSTRUCTIONS.

On November 1, 1915, the members of the survey commission received a letter from President Crawford outlining the objects which the board had in view in requesting the survey, and calling attention to the fact that the various institutions in question were established by constitutional provisions, back of which it was not deemed to be the province of this survey to go. The instructions to the commission emphasized the desirability of a report on the conditions as they exist in the several institutions, and especially

a careful study of the question of unnecessary duplication of work. It was made clear, however, that the board desired a comprehensive, constructive report, looking toward the future development of a sound and progressive State policy of higher education rather than a mere critical analysis of any defects that might be found to exist.

PROCEDURE.

At the request of the State board of regents, the director and two members of the commission met with the board at Bismarck, N. Dak., on Monday, November 1, 1915. Immediately after this conference the study of the State institutions was begun. The director and all members of the commission visited the university, the agricultural college, and the State normal school at Valley City. Each of the remaining institutions was visited by at least two members of the commission. The aggregate number of days spent in the field visiting these institutions was approximately 100, which was supplemented by time spent in the office of the Bureau of Education in Washington in preparing the report.

In January, 1916, the three members of the commission met with the State board of regents, at which time the presidents of the State schools, the secretary and treasurer of the library commission, the State superintendent of public instruction, and the State inspector of consolidated, graded, and rural schools, were invited to appear and make such statements as they desired to make concerning the functions of the institutions and offices represented, and subsequently to file briefs. Both in the conference and in the formal statements filed in reply to the questions of the commission, these officers displayed a most commendable spirit of cooperation. All seemed eager to work together for the development of an educational system that should bring to all interests of the State the largest possible returns for the money invested.

In April the Commissioner of Education appeared before the State board of regents at Bismarck, N. Dak., and submitted a preliminary general report on the work of the survey.

In June the three members of the commission met with the Commissioner of Education in Washington, to formulate and review the conclusions which had been reached. At this time an outline of the conclusions was forwarded to the State board of regents.

The commission finds it a pleasure to express appreciation of the courtesy and cooperation which have been extended by the citizens of North Dakota, the presidents and members of the faculties of all the schools, the State superintendent of education, the inspector of consolidated, graded, and rural schools, officers of the library commission, State officials at the capital, and many others both in public and private life.

STATE HIGHER EDUCATIONAL INSTITUTIONS OF NORTH DAKOTA.

Chapter I.

THE STATE OF NORTH DAKOTA.

North Dakota, with a land area of 70,183 square miles and a water surface of 654 square miles, is one of the larger States of the Union, ranking sixteenth in size. The entire area lies within the Great Plains, far away from ocean, away from lakes that serve as highways for commerce, and from large navigable streams. It is almost wholly without forests. There are few falls and rapids capable of being developed into water powers. A large portion of the western half of the State is underlaid with lignites, and here also extensive deposits of clays for brick, tiling, and pottery are found. Gold, silver, copper, lead, and iron are unknown. The soil varies from the rich alluvial and lacustrine Red River Valley on the east through the rolling uplands of the Coteau Plateau to the residual prairies and high plains sections of the west and southwest. The total average precipitation varies from about 20 inches in the east to about 15 inches in the west. Most of this comes in the form of rainfall through the growing seasons of spring, summer, and early fall and is in most years sufficient in all parts of the State for maturing crops without irrigation. Only a small fraction of 1 per cent of the land under cultivation is irrigated.

The winters are long, the summers short. This limits the range of profitable farming to the hardy cereals, grasses, fruits, vegetables, and root crops, and to live-stock growing. In 1910, of the total crop acreage, 99.6 per cent was in cereals and other grains, and 91 per cent of the value of all crops came from wheat, oats, flaxseed, barley, hay, and forage. Most of the State may be profitably farmed, and more than half of it is already improved. Of the total area of the State, 63.6 per cent in 1910 was in farms, and 72 per cent of this, or 45.5 per cent of the whole, was improved.

POPULATION.

The population of the State is still small, but it is growing rapidly from natural increase, from foreign immigration, and from immigration from other States, mostly from those of the Middle West. The population of the territory now included in North Dakota was 2,405 in 1870; 36,909 in 1880; 190,983 in 1890; 319,146 in 1900; 577,056 in 1910; and is approximately 700,000 in 1916. This indicates a probable population of 2,000,000 by the middle of the century. The population is now about 10 to the square mile. With a population of 2,000,000 there will be a little less than 30 to the square mile. Formerly a very large majority of the people of the State lived in the eastern half, but the population is now more evenly distributed. In 1910, 40 per cent lived west of a line drawn through the western boundary of McIntosh, Logan, Kidder, Wells, Pierce, and Rolette Counties. Probably 45 per cent are now west of this line.

North Dakota is definitely a rural State with rural interests, and although the population of the cities and towns will continue to increase more rapidly in proportion than the population of the rural districts, as it has done for many years, the life and interest of the State will continue to be predominantly rural for decades to come. There are no large cities in the State and none near it. On the north lies Saskatchewan and Manitoba, with their sparse populations; on the south South Dakota, and on the west and southwest Montana, Wyoming, and Idaho, all without large cities and with a population still more sparse than that of North Dakota. The nearest cities with a population as large as 100,000 are St. Paul and Minneapolis, more than 200 miles east of the Red River; and Omaha, Des Moines, Kansas City, Denver, Salt Lake City, and Spokane, from 400 to 1,000 miles to the south, southwest, and west. There will probably be no large cities in the State and few near it within the next quarter or half century, but there will be many small towns, centers of agricultural communities, with their local commerce and varied small local industries.

In 1910 there were only five places with a population of 5,000 or more, and only two with a population greater than 10,000. Only 95,381 people lived in the 34 places of 1,000 population and over. This was only 16.5 per cent of the total population; 83.5 per cent of the population lived in the open country and in towns and villages of less than 1,000. Only 28 per cent lived in the 226 cities, towns, and villages of all sizes, 142 of which had less than 500 inhabitants. Only 11 per cent lived in towns and cities of 2,500 and over; 89 per cent of the total population and 90.3 per cent of the population between 10 and 20 years old were rural as counted by the United States census. Even the people in urban communities lived largely under rural conditions as to housing, as is shown by the fact that in 1910 there were

in the State 118,757 separate dwelling houses for a total of 120,910 families.

RACIAL COMPOSITION OF POPULATION.

More than 70 per cent of the population of North Dakota are foreign born or of immediate foreign descent, as may be noted in

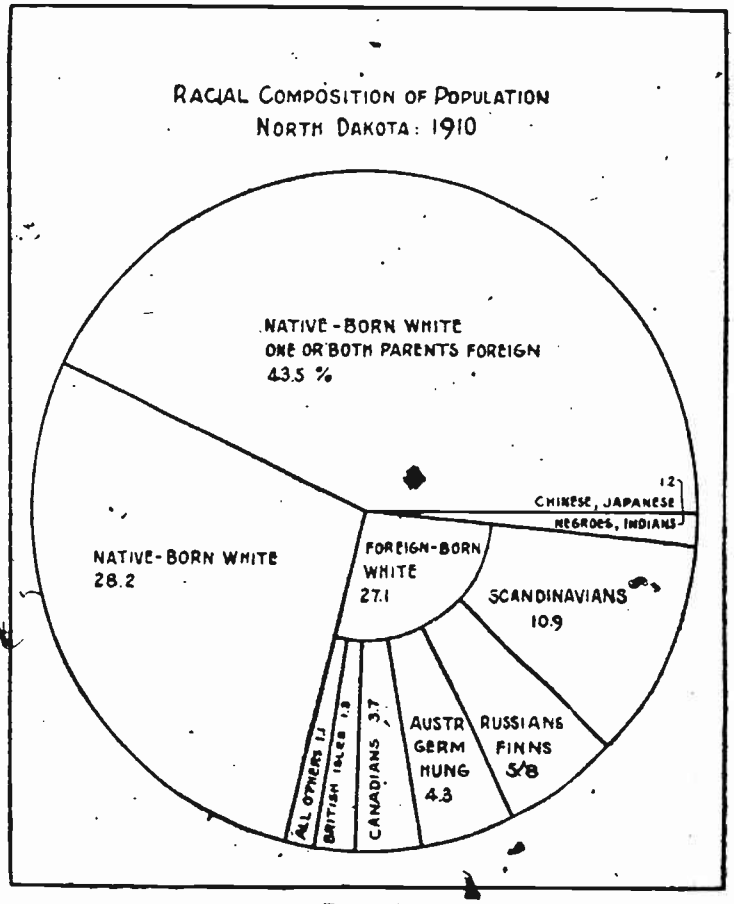

FIGURE 1.

More than 70 per cent of the population of North Dakota are foreign-born or of immediate foreign descent, the foreign elements consisting largely of immigrants from those strong and virile stocks of northern and western Europe, whose peoples have shown special capacity for adapting themselves to American conditions and ideals. (See Table 1.)

Table 1 and Figure 1. It may be noted further that the foreign elements are of the most desirable types, coming largely from those countries of northern and western Europe whose peoples have shown special capacity for adapting themselves to American conditions and ideals.

Nevertheless, the fact that there are within the State considerable numbers of persons of foreign descent, grouped for the most part in settlements more or less clearly differentiated by language or racial characteristics, inevitably creates special difficulties for the schools. Not only the common schools, but the higher institutions of learning as well, must adapt themselves to the special conditions that exist, if they are to render their full service to the State.

The character of the foreign-born population is shown by the fact that more than one-half of the farm operators are foreign-born, although only 27.1 per cent of the total population are foreign-born.

TABLE 1.—*Racial composition of population, 1910.*

Country of birth.	Number.	Per cent.
Native-born white	162,461	28.2
Native-born white, one or both parents foreign	251,236	43.5
Foreign-born white:		
From Norway, Sweden, Denmark	63,452	10.9
From Russia, Finland	33,096	5.8
From Austria, Germany, Hungary	24,576	4.3
From Canada	21,507	3.7
From England, Scotland, Ireland, Wales	7,486	1.3
From all other countries	6,537	1.1
Chinese, Japanese, Negroes, Indians	7,201	1.2
Total	577,056	100.0

AGE DISTRIBUTION OF POPULATION.

According to the United States census figures for 1910, Table 2, presented graphically in Figure 2, the population of North Dakota contains slightly more than average proportions in the age groups under 25 years, and slightly less than the average in the groups above this age. Comparing North Dakota in this respect with the neighboring agricultural States of South Dakota, Nebraska, and Iowa, it appears that North Dakota contains slightly larger proportions in the age groups under 45 years, and slightly smaller proportions in the groups above this age. (See Figure 3.)

There are apparently no special conditions as regards the age composition of the population which affect the educational problems of the State.

TABLE 2.—*Age distribution of total population, 1910.*

Age groups.	North Dakota.	Average for United States.	South Dakota, Nebraska, and Iowa combined.
	Per cent.	*Per cent.*	*Per cent.*
Under 5 years	14.3	11.6	11.6
5 to 14 years	22.4	20.5	21.0
15 to 24 years	20.5	19.7	20.4
25 to 44 years	29.0	29.1	27.9
45 to 64 years	11.3	14.6	14.4
65 years and over	2.5	4.5	3.3
Total	100.0	100.0	100.0

SCHOOL ATTENDANCE AND ILLITERACY.

The percentage of illiteracy in the native white population is 1.5 per cent; in the foreign-born white population, 1.7 per cent, much

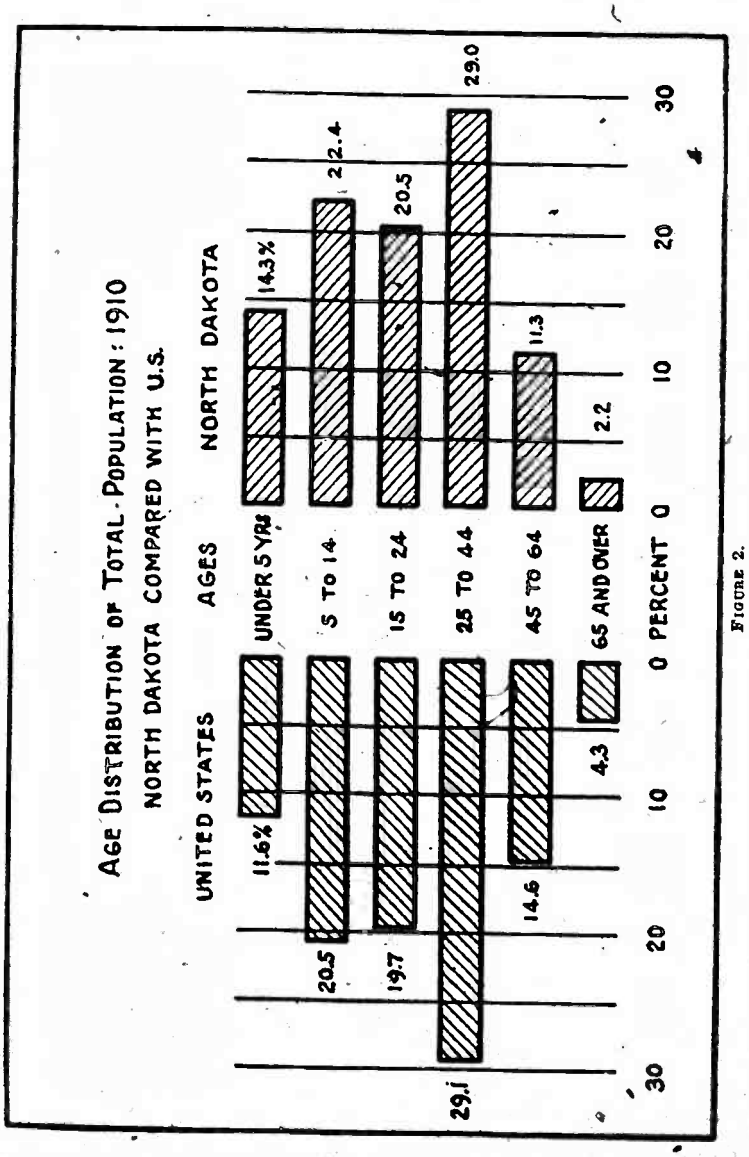

FIGURE 2.
The population of North Dakota contains slightly more than average proportions in the age groups under 25 years, and slightly less than the average in the groups above this age.

less in both classes than the average for the United States. This small percentage of illiteracy is due not only to the schools of North Dakota, but to the fact that the immigration from other States has

been mostly from those with good school systems of long standing, while the foreign immigration has been very largely from European States in which elementary education, at least, is practically univer-

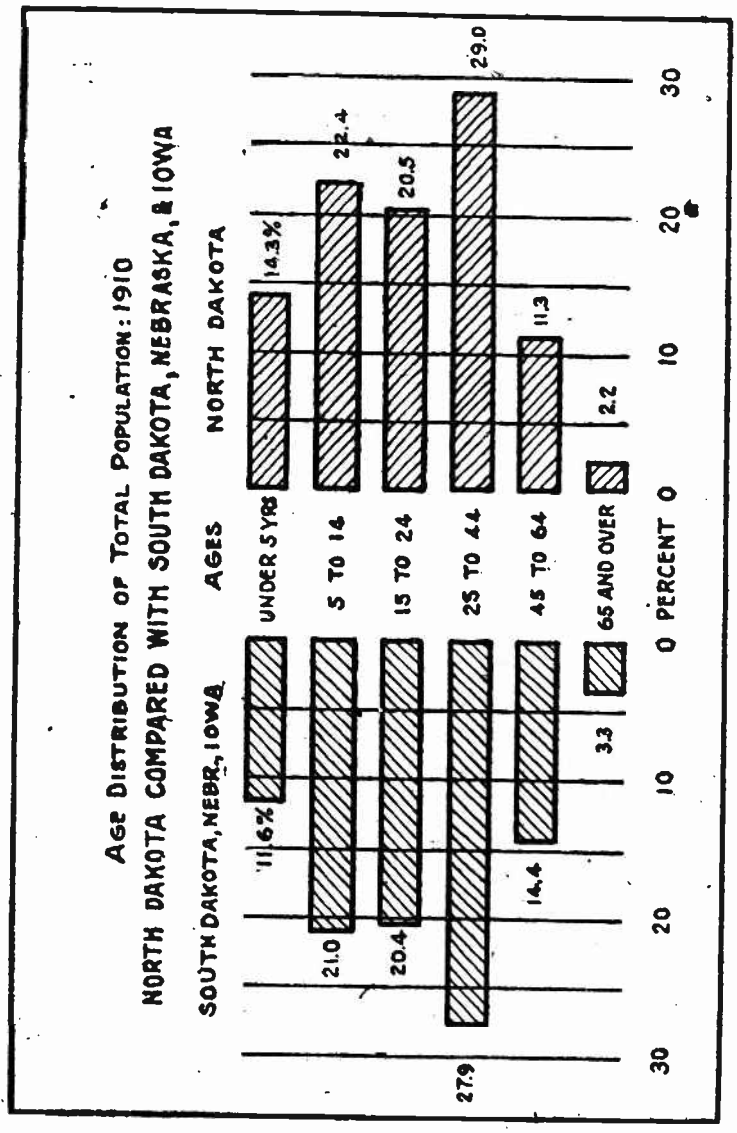

FIGURE 3.

The population of North Dakota contains slightly larger proportions in the age groups under 45 years, and slightly less than the average in the groups above this age, as compared with the neighboring agricultural States of South Dakota, Nebraska, and Iowa. There are apparently no special conditions as regards the age composition of the popula-tion which affect the educational problems of the State.

sal. Only 1.7 per cent of the population of all classes between the ages of 10 and 20 were reported as illiterate in 1910. This shows also the effectiveness of the elementary schools of the State in reducing illiteracy.

In 1910, of all children from 6 to 9 years old, 70.6 per cent attended schools; from 10 to 14 years, 90 per cent; from 15 to 17 years, 57.4 per cent; from 18 to 20 years, 17.4 per cent.

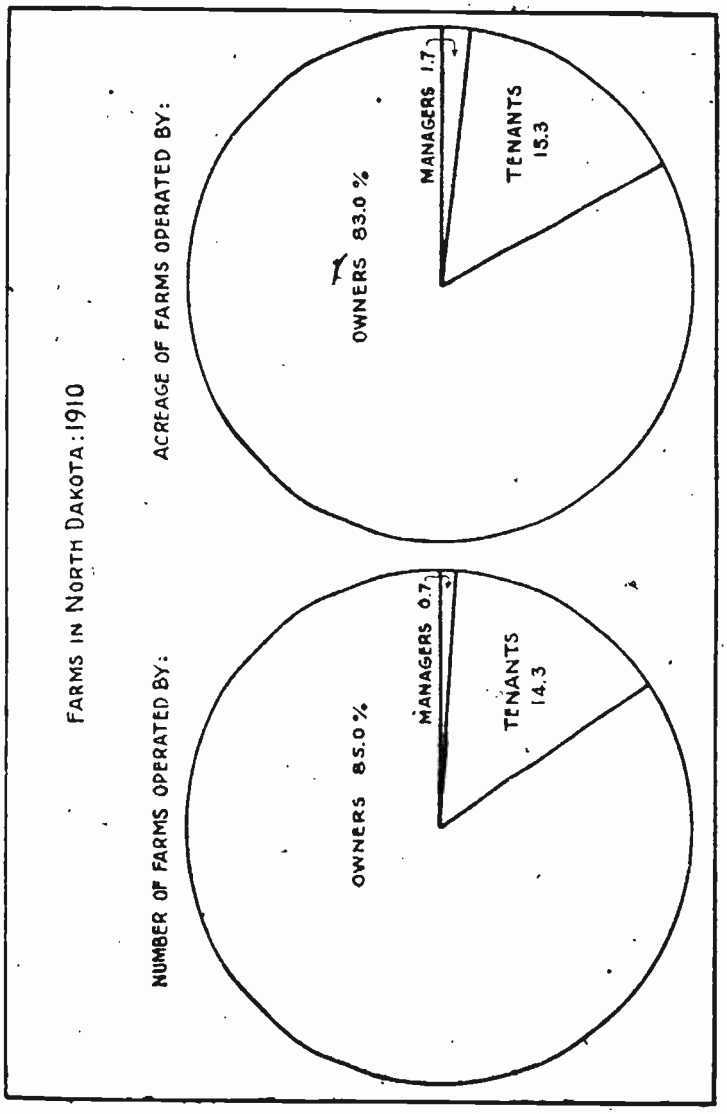

FIGURE 4.
In North Dakota 85 per cent of farms and 83 per cent of farm acreage are operated by the owners.

Of urban children from 6 to 14 years of age, 84.2 per cent attended school; of urban children from 15 to 20 years, 43.1 per cent. Of rural children from 6 to 14 years, 80.4 per cent, and of rural children from 15 to 20 years, 37.7 per cent. (See Table 3.)

TABLE 3.—*Percentages of children of specified ages in North Dakota reported as attending school, 1910.*

Ages.	All children.	Urban children.	Rural children.
6 to 9 years	70.6		
10 to 14 years	90.0		
6 to 14 years		84.2	80.6
15 to 17 years	57.4		
18 to 20 years	17.4		
15 to 20 years		43.1	37.7

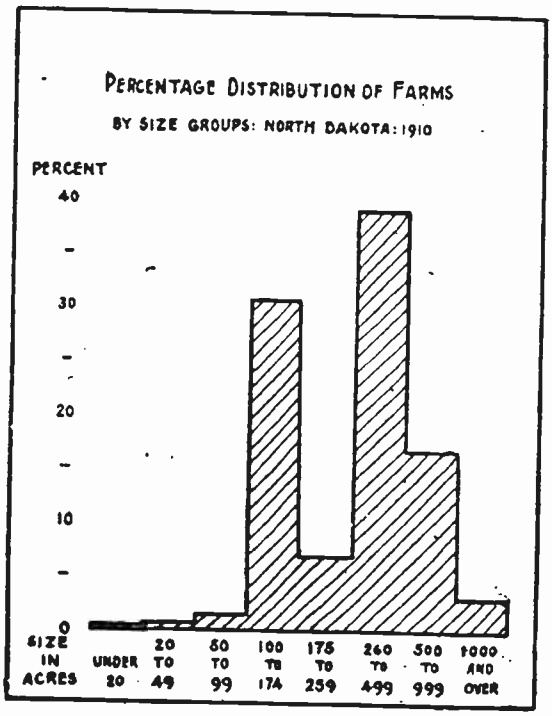

FIGURE 5.

In 1910 less than 5 per cent of the farms contained less than 100 acres each, and only 20.2 per cent contained more than 500 acres.

FARMING AND OTHER INDUSTRIES.

The nature of the farming in North Dakota is indicated by the following facts from the census of 1910:

Of the whole number of farms, 85 per cent are operated by their owners, 14.3 per cent by tenants, 0.7 per cent by managers. (See Table 4 and Figure 4.)

More than 60 per cent of all the farms hired some labor, and nearly $22,000,000 was expended in farm wages.

The farms averaged 382.3 acres, and the average had been increasing for 20 years.

Less than 5 per cent of the farms contained less than 100 acres each, and only 20.2 per cent contained more than 500 acres. (See Table 5 and Figure 5.)

TABLE 4.—*Farms in North Dakota, 1910.*

Farms operated by—	Number.	Per cent.	Area in acres.	Per cent.
Owners	63,212	85.0	23,586,728	83.0
Managers	484	.7	477,213	1.7
Tenants	10,664	14.3	4,362,709	15.3
Total	74,360	100.0	28,426,650	100.0

TABLE 5.—*Distribution of farms by size groups, North Dakota, 1910.*

Size groups.	Number.	Per cent.	Size groups.	Number.	Per cent.
Under 20 acres	229	0.3	260 to 499 acres	29,048	39.1
20 to 49 acres	450	.6	500 to 999 acres	12,662	17.0
50 to 99 acres	1,207	1.6	1,000 acres and over	2,416	3.2
100 to 174 acres	23,003	30.9	Total	74,360	100.0
175 to 259 acres	5,345	7.2			

The percentage of farms operated by tenants in North Dakota, 14.3, is very much less than that for the United States, 37, as shown in Table 6. The same table shows that in 11 States situated in various sections of the country the percentage of farms operated by tenants, 52.9, is nearly four times as great as in North Dakota.

To these considerations should be added the fact that in 1910 the average value of the 74,360 farms in North Dakota, including equipment, was $13,109. Not only is North Dakota overwhelmingly agricultural in its interests, but the people for the most part own their own farms, and each farm represents the investment of a considerable amount of capital. Socially and economically, therefore, the State is made up of a relatively high class of citizens abundantly able to pay for educational advantages and to utilize them fully. Such a population is far more likely to be interested in scientific and practical agricultural education than the tenant classes to be found in some other States.

TABLE 6.—*Tenancy of farms in certain States.*

States.	Percentage distribution of farms operated by—				Percentage distribution of acreage of farms operated by—			
	Owners.	Managers	Tenants.	Total.	Owners.	Managers	Tenants.	Total.
Illinois	57.6	0.9	41.4	100.0	54.7	1.7	43.6	100.0
Delaware	57.0	1.1	41.9	100.0	45.9	2.0	52.1	100.0
North Carolina	57.3	.4	42.3	100.0	69.8	2.6	27.6	100.0
South Carolina	36.5	.5	63.0	100.0	59.6	4.1	36.4	100.0
Georgia	33.9	.5	65.6	100.0	55.1	2.9	42.0	100.0
Tennessee	58.6	.3	41.1	100.0	73.2	1.7	25.1	100.0
Alabama	39.5	.2	60.2	100.0	64.1	1.8	34.2	100.0
Mississippi	33.6	.3	66.1	100.0	63.1	3.2	33.7	100.0
Arkansas	49.7	.4	50.0	100.0	71.1	1.9	27.0	100.0
Louisiana	44.0	.8	55.3	100.0	64.8	9.4	25.7	100.0
Oklahoma	44.9	.3	54.8	100.0	55.4	1.5	43.1	100.0
Average of 11 States	46.6	.5	52.9	100.0	61.5	3.0	35.5	100.0
Average United States	62.1	.9	37.0	100.0	68.1	6.1	25.8	100.0
North Dakota	85.0	.7	14.3	100.0	83.0	1.7	15.3	100.0

Most farmers grow a variety of crops within the range already indicated. Nearly half report vegetables in small quantities. The total value of vegetables reported was $3,148,304.

A very large per cent report horses, cattle, swine, poultry, and other live stock.

The total value of crops was $180,636,000; of live stock, $110,000,000; of animals sold and slaughtered, $14,457,000.

The value of milk, cream, butter fat sold and butter and cheese made was $4,872,304.

The value of forest products was almost negligible.

Although the total value of manufactured products increases from year to year, there are as yet no very large industrial plants. The 752 industrial establishments reported in 1910 had a capital of $1,585,000, paid in salaries and wages $2,416,000, and had an output valued at $19,138,000. Fully two-thirds of the value of all manufactured products consisted of the products of flour mills and of butter and cheese, the latter in small amounts. The total value added by the manufacturing process was $5,468,000.

Persons engaged in manufacturing numbered 4,148, only 2,732 of whom were wage earners.

Mining industries are increasing, but as yet are comparatively unimportant. In 1910 only 960 persons were reported as engaged in mining, including proprietors, officials, clerks, and wage earners. The total capital invested was $1,058,649; the amount paid in wages, $570,140; and the value of products, $564,000.

In the year 1910 the capital invested in farming in North Dakota was 84 times that invested in manufacturing and 926 times that invested in mining. (Table 7.) The number of farm operators was 103 times the number of operators of industries and 1,403 times the

number of mining operators. The value of farm products was 11 times the value of manufactured products and 37 times the value of manufactured products over the value of raw material used in these products. It was 361 times the value of products of the mines.

TABLE 7.—*Relative magnitude and value of farming, manufacturing, and mining in North Dakota, Federal census of 1910.*

	Farming.	Manufacturing.	Mining.
Capital invested	$974,814,205	$11,585,000	$1,058,642
Operators	74,360	[1] 723	53
Value of products	$204,000,000	[2] $19,138,000	$564,812

[1] Proprietors and firm members.
[2] Value added to raw material by the manufacturing process, $5,464,000.

SUMMARY OF OCCUPATIONS.

A general view of the gainful occupations followed by the people of North Dakota is afforded by Table 8, which also compares this State with the neighboring States of South Dakota, Nebraska, and Iowa, combined, and with the States of New York, Pennsylvania, New Jersey, and Ohio, combined. (See also Figures 6 and 7.)

In North Dakota, even more than in the three neighboring States referred to, agriculture is preeminent, 60.2 per cent and 45.8 per cent, respectively. The "trade" and "manufacturing" groups are much less important in North Dakota, where, together, they comprise only 18 per cent of all occupations reported, whereas in the three States mentioned they include 27.5 per cent of the total. The differences between North Dakota and these three States in the cases of the remaining occupation groups are not striking.

TABLE 8.—*Distribution by general divisions of persons 10 years of age and over engaged in gainful occupations—North Dakota compared with South Dakota, Nebraska, and Iowa, combined; and with New York, Pennsylvania, New Jersey, and Ohio combined, 1910.*

Division of occupations.	North Dakota.		South Dakota, Nebraska, and Iowa, combined.		New York, Pennsylvania, New Jersey and Ohio, combined.	
	Number engaged.	Per cent.	Number engaged.	Per cent.	Number engaged.	Per cent.
Agriculture, forestry, animal husbandry	130,919	60.2	682,068	45.8	1,240,358	12.2
Extraction of minerals	506	.2	20,642	1.3	400,721	3.9
Manufacturing and mechanical industries	21,839	9.8	258,433	17.4	4,038,100	39.8
Transportation	18,813	6.4	113,423	7.6	805,861	7.9
Trade	17,910	8.2	151,161	10.1	1,183,720	11.7
Public service (not elsewhere classified)	1,597	.7	14,336	.9	139,576	1.4
Professional service	9,851	4.5	86,111	5.8	493,428	4.9
Domestic and personal service	17,318	8.0	113,810	7.6	1,139,632	11.3
Clerical occupations	4,165	1.9	46,500	3.1	686,544	6.8
Total	217,418	100.0	1,486,504	100.0	10,127,940	100.0

North Dakota, 1910.—Total population, 577,056; engaged in gainful occupations, 217,418; per cent of total population, 37.7.

On the other hand, comparison of North Dakota with four of the Eastern States—New York, Pennsylvania, New Jersey, and Ohio—combined serves to emphasize the predominance of agricultural in-

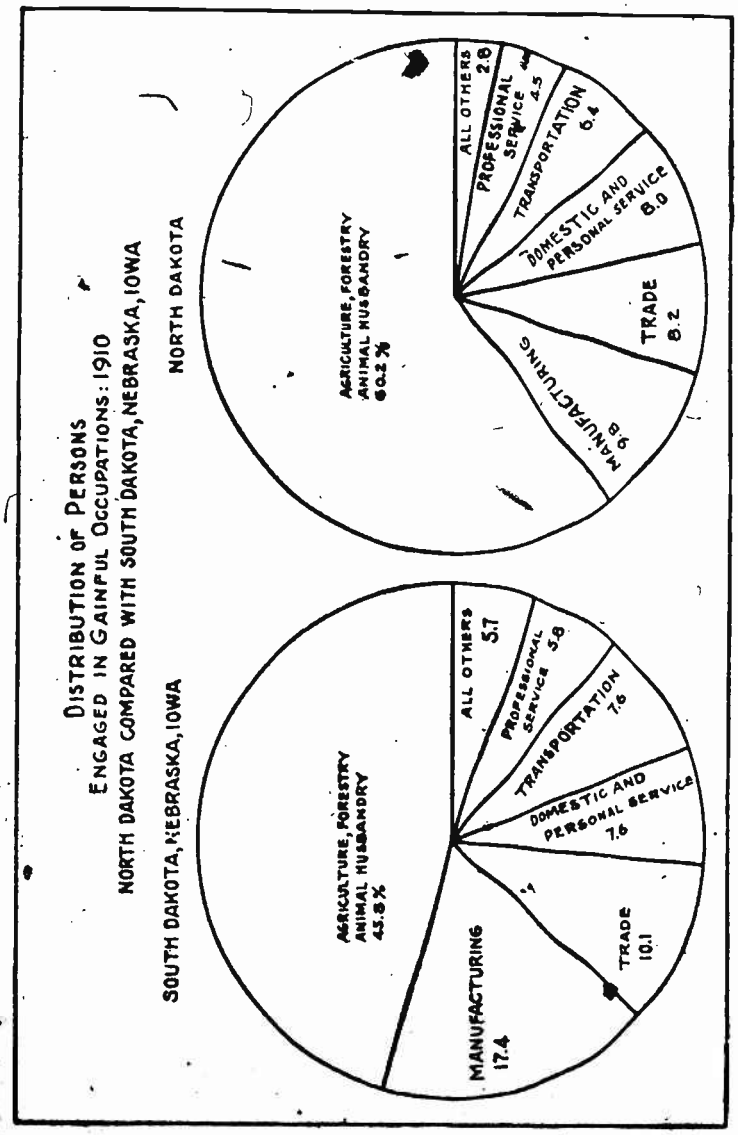

FIGURE 6.

In North Dakota, even more than in the three neighboring States indicated, agriculture is preeminent.

terests in the former. Agriculture, forestry, and animal husbandry constitute only 12.2 per cent of the occupations in the four States considered together, as compared with 60.2 per cent in North Dakota. (See Figure 7.)

The predominance of agricultural interests in North Dakota is still further emphasized by an examination of the constituent elements of the occupational group designated by the census report as

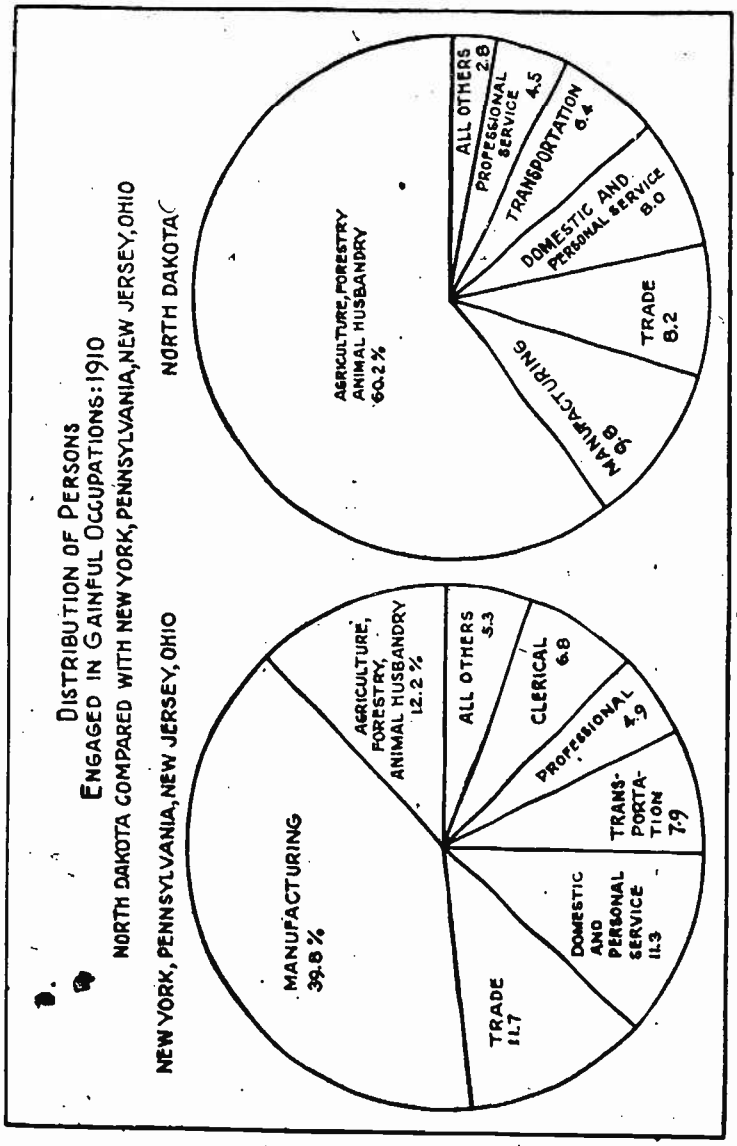

FIGURE 7.

Proportionately, agricultural interests are nearly five times as important in North Dakota as in New York, New Jersey, and Ohio combined; and in the latter States the manufacturing interests are more than four times as important as in North Dakota.

"Agriculture, forestry, and animal husbandry." Certain of these occupations, clearly distinguishable from agriculture, are of very slight importance in North Dakota. Thus, foresters, lumbermen,

raftsmen, woodchoppers, owners and managers of log and timber camps, fishermen, and oystermen (combined), number 21,351 in the four States mentioned, or 1.7 per cent of the occupations reported in this group; in North Dakota, however, there are only 97 persons engaged in all these occupations. Not only do they constitute an almost negligible number, absolutely, but they comprise only seven-hundredths of 1 per cent of the occupations in the "agriculture, forestry, and animal husbandry" group.

In these four Eastern States the "manufacturing" group comprises nearly two-fifths of the total (39.8 per cent), instead of less than one-tenth (9.8 per cent), as in North Dakota. Clerical occupations also occupy a far more important place in the four States (6.8 per cent) than in North Dakota (1.9 per cent).

RESOURCES AVAILABLE FOR EDUCATIONAL PURPOSES.

In the following pages certain tables are presented showing comparative figures for the 48 States of the Union with respect to resources available for educational purposes. The tables are based on data given in the reports of the Census Bureau and the Commissioner of Education.

From Table 9 it appears that North Dakota ranks seventh from the top in average value of property per child of school age. With an average property value of $10,900 on which to draw for the education of each child 5 to 18 years of age, North Dakota has, in this respect, more than five times the resources of the lowest State in the list.

Supplementing the analysis already given of the age distribution of the population in North Dakota (see Table 2 and figures 2 and 3), another view of the conditions as they affect the problem of education is afforded in Table 10, which compares the 48 States by the number of men 21 years of age and over for each 100 children of school age. North Dakota, ranking thirty-first in the list, with 93 men to 100 children, thus has considerably more children to be educated than there are men of income-producing years. Only 16 States have a smaller proportion of men over 21 years of age, while the State ranking highest has nearly twice as many.

Comparing the amounts expended for public schools for each adult male, North Dakota ranks second, with $33.52. (Table 11.) In amount expended for public schools in proportion to wealth it ranks twenty-sixth. (Table 12.) Apparently the State can, without undue stress, tax itself more heavily than it now does for the support of higher education.

According to Table 13, North Dakota, with $34.17, ranks ninth in the amount expended on public schools for each child of school age.

North Dakota ranks ninth also in receipts of higher educational institutions per capita of population, with $2.17. (Table 14.)

TABLE 9.—*Value of property, by States, for each child 5–18 years of age (1913).*

1. Nevada	$28,400
2. California	15,500
3. Iowa	12,700
4. Montana	12,300
5. Colorado	11,100
6. Oregon	11,100
7. North Dakota	**10,900**
8. Nebraska	10,700
9. Washington	10,400
10. Wyoming	10,200
11. Illinois	10,000
12. New York	9,900
13. Vermont	9,500
14. Kansas	9,400
15. Minnesota	8,900
16. Arizona	8,600
17. New Jersey	8,100
18. Connecticut	7,900
19. South Dakota	7,500
20. Massachusetts	7,300
21. Ohio	7,300
22. Oklahoma	7,300
23. Indiana	7,200
24. Michigan	7,100
25. Pennsylvania	6,900
26. Rhode Island	6,600
27. Wisconsin	6,400
28. New Hampshire	6,300
29. Missouri	6,300
30. Utah	6,300
31. Idaho	5,900
32. Maine	5,900
33. West Virginia	5,800
34. Delaware	5,700
35. Maryland	5,700
36. Texas	5,000
37. New Mexico	4,700
38. Florida	4,300
39. Louisiana	3,800
40. Arkansas	3,400
41. Virginia	3,400
42. Kentucky	3,100
43. Alabama	2,900
44. Tennessee	2,700
45. Georgia	2,600
46. South Carolina	2,500
47. North Carolina	2,200
48. Mississippi	2,100

TABLE 10.—*Number of men 21 years of age and over, by States, for each 100 children 5 to 18 years of age (1910).*

1. Nevada	180
2. Wyoming	179
3. California	169
4. Montana	165
5. Washington	151
6. Oregon	148
7. Arizona	129
8. Colorado	125
9. New Hampshire	123
10. Maine	120
11. Vermont	119
12. New York	117
13. Massachusetts	110
14. Connecticut	115
15. Idaho	113
16. Ohio	113
17. Rhode Island	111
18. New Jersey	110
19. Michigan	109
20. Illinois	108
21. Delaware	107
22. Indiana	106
23. Pennsylvania	105
24. Minnesota	99
25. Iowa	98
26. Kansas	98
27. Missouri	98
28. South Dakota	96
29. Nebraska	95
30. Maryland	94
31. North Dakota	**93**
32. Wisconsin	93
33. New Mexico	88
34. Florida	87
35. Utah	85
36. West Virginia	84
37. Kentucky	79
38. Oklahoma	78
39. Tennessee	74
40. Virginia	74
41. Texas	72
42. Arkansas	70
43. Louisiana	70
44. Alabama	67
45. Georgia	66
46. Mississippi	65
47. North Carolina	63
48. South Carolina	58

TABLE 11.—*Amount expended for public schools (1912–13), by States, for each adult male (1910).*

1.	Utah	$38.67
2.	**North Dakota**	**38.52**
3.	Idaho	32.55
4.	New Jersey	29.36
5.	Washington	28.54
6.	Montana	28.50
7.	California	27.76
8.	Nebraska	26.07
9.	Minnesota	24.54
10.	Colorado	24.02
11.	Iowa	23.57
12.	Oregon	23.50
13.	Arizona	23.34
14.	South Dakota	23.28
15.	Indiana	23.15
16.	Massachusetts	22.96
17.	Kansas	22.23
18.	New York	21.87
19.	Illinois	21.82
20.	Michigan	21.56
21.	Ohio	21.11
22.	Pennsylvania	20.17
23.	Connecticut	19.66
24.	Wisconsin	18.56
25.	Oklahoma	$17.99
26.	Vermont	17.10
27.	Rhode Island	16.95
28.	Wyoming	16.72
29.	Missouri	15.96
30.	Nevada	15.62
31.	Maine	15.27
32.	West Virginia	14.99
33.	Texas	14.44
34.	Maryland	13.55
35.	New Hampshire	13.55
36.	Florida	12.29
37.	New Mexico	11.79
38.	Kentucky	11.77
39.	Louisiana	11.76
40.	Arkansas	10.81
41.	Tennessee	10.61
42.	Virginia	10.47
43.	Delaware	9.85
44.	Georgia	8.70
45.	North Carolina	8.03
46.	Alabama	7.94
47.	South Carolina	7.68
48.	Mississippi	6.57

TABLE 12. — *Amount expended for higher education, by States, for each $1,000 of wealth.*

[Based on the estimated true value of all property, U. S. Census, 1912, and total receipts of universities and normal schools as shown in the Report of the Commissioner of Education, 1913–14.]

1.	Delaware	$3.88
2.	New Hampshire	1.84
3.	Massachusetts	1.47
4.	Virginia	1.37
5.	Wisconsin	1.27
6.	Connecticut	1.25
7.	Arizona	1.23
8.	South Carolina	1.21
9.	Maryland	.95
10.	North Carolina	.94
11.	Maine	.92
12.	Mississippi	.87
13.	Tennessee	.80
14.	Minnesota	.79
15.	New York	.74
16.	Michigan	.73
17.	South Dakota	.72
18.	Idaho	.71
19.	Utah	.70
20.	California	.68
21.	Illinois	.68
22.	Oregon	.67
23.	Alabama	.65
24.	Washington	.64
25.	Georgia	.61
26.	**North Dakota**	**.61**
27.	New Mexico	.60
28.	Vermont	.60
29.	Ohio	.56
30.	Rhode Island	.56
31.	Wyoming	.56
32.	Louisiana	.55
33.	Pennsylvania	.54
34.	Kansas	.53
35.	Iowa	.51
36.	Nebraska	.51
37.	Colorado	.50
38.	Kentucky	.50
39.	Texas	.49
40.	Montana	.48
41.	Nevada	.47
42.	Florida	.44
43.	Indiana	.42
44.	Missouri	.42
45.	New Jersey	.39
46.	West Virginia	.39
47.	Arkansas	.30
48.	Oklahoma	.19

TABLE 13.—*Amount expended on public schools, by States, for each child 5 to 18 years of age (1913–14).*

1.	California	$49.58
2.	Montana	41.48
3.	Nevada	40.72
4.	Washington	40.57
5.	Arizona	37.15
6.	Utah	34.68
7.	Oregon	34.63
8.	New Jersey	34.47
9.	**North Dakota**	**34.17**
10.	Idaho	33.71
11.	Wyoming	33.13
12.	Massachusetts	31.68
13.	Colorado	31.02
14.	Minnesota	30.78
15.	Nebraska	29.86
16.	Ohio	29.60
17.	Connecticut	29.39
18.	New York	29.20
19.	Indiana	28.73
20.	Iowa	28.17
21.	Illinois	26.48
22.	Kansas	25.87
23.	Michigan	25.66
24.	Pennsylvania	25.57
25.	South Dakota	24.77
26.	Maine	23.68
27.	Vermont	23.36
28.	New Hampshire	21.59
29.	Rhode Island	20.97
30.	Wisconsin	20.59
31.	Missouri	19.88
32.	Maryland	15.70
33.	West Virginia	14.00
34.	Oklahoma	12.65
35.	New Mexico	12.02
36.	Florida	11.81
37.	Delaware	11.76
38.	Texas	10.80
39.	Kentucky	9.76
40.	Louisiana	8.69
41.	Tennessee	8.67
42.	Virginia	8.54
43.	Arkansas	8.24
44.	North Carolina	6.64
45.	Alabama	6.22
46.	Georgia	6.21
47.	South Carolina	5.90
48.	Mississippi	4.58

TABLE 14.—*Receipts of higher educational institutions, including normal schools, per capita of population (1913–14).*

1.	Delaware	$5.65
2.	Arizona	2.94
3.	New Hampshire	2.62
4.	Nevada	2.53
5.	Massachusetts	2.51
6.	Connecticut	2.43
7.	Wisconsin	2.33
8.	California	2.30
9.	**North Dakota**	**2.17**
10.	Minnesota	1.99
11.	Oregon	1.83
12.	New York	1.77
13.	Illinois	1.768
14.	Iowa	1.714
15.	Washington	1.711
16.	South Dakota	1.64
17.	Nebraska	1.54
18.	Maryland	1.46
19.	Virginia	1.45
20.	Montana	1.44
21.	Colorado	1.43
22.	Kansas	1.38
23.	Utah	1.38
24.	Vermont	1.35
25.	Michigan	$1.35
26.	Wyoming	1.32
27.	Idaho	1.279
28.	Maine	1.277
29.	South Carolina	1.04
30.	Ohio	1.01
31.	Pennsylvania	1.00
32.	Rhode Island	.98
33.	New Mexico	.92
34.	Texas	.83
35.	New Jersey	.81
36.	Indiana	.77
37.	North Carolina	.75
38.	West Virginia	.71
39.	Missouri	.70
40.	Louisiana	.68
41.	Tennessee	.67
42.	Mississippi	.63
43.	Florida	.60
44.	Alabama	.57
45.	Georgia	.54
46.	Oklahoma	.51
47.	Kentucky	.47
48.	Arkansas	.33

Chapter II.

BRIEF OUTLINE OF EDUCATIONAL NEEDS, AS INDICATED BY CHARACTER AND RESOURCES OF THE STATE.

The foregoing brief survey of the State and its resources, of the people and their occupations, and of their industrial, social, and economic status, indicates, in broad outline at least, the educational needs of the people and what should be expected of the institutions under the control of the board of regents and included in this survey.

A vigorous, democratic, progressive, pioneer people, with an unusually high average of wealth, with little poverty and no class of idle rich, offers the best possible opportunity for universal education of a high standard, ideal and cultured on the one hand and scientific and practical on the other. To this end there is need of a strong and efficient system of elementary and secondary schools in the State, the elementary schools consolidated sufficiently to make possible the best results and the most economical use of funds, and the high schools numerous enough to be within reach of all. The uniformity of conditions and the small variety of occupations emphasize the need for strength and efficiency in the work of the schools rather than for large variety in vocational and prevocational courses. The predominance of rural and agricultural life indicates the need for a larger proportion of teachers trained for the work of the rural schools and for making the work of the schools such as to prepare for success in agricultural pursuits and for intelligent, joyous living in the open country and in small villages and towns. It also indicates the need for some system of public libraries that will serve effectively a rural population.

The large number of rural schools in the State as compared with the number of urban schools, and the character of work needed to be done in these schools, show clearly the task of the normal schools, the school of education in the university, and the department of education in the agricultural college.

The comparatively small number of persons engaged in the professions other than teaching and the ministry indicates the unwisdom of maintaining at present in more than one institution schools or courses intended to prepare men and women for any one of these professions. This would seem to apply with special force to the

various forms of professional engineering, in none of which, except those connected with or growing immediately out of agriculture, is there present or probable immediate future need for any large number of highly trained men. On the other hand, an unusually large number of people engaged in agriculture on a comparatively large scale, on their own farms and not as hirelings or tenants, makes an unusual demand for a very large number of men possessed of such scientific knowledge and training as will enable them to cultivate their farms, market their crops, breed and feed and otherwise care for their live stock, and perform all the other duties of agriculturists intelligently and profitably without other guidance than their own knowledge and their own powers of intelligent observation and judgment.

Again, the limited range of variety in soil and climate and in staple crops shows the importance of providing comparatively few strong and fundamental courses in agriculture for the largest possible number of students, rather than a large variety of intensively specialized courses for fewer students. The same conditions call for a similar policy in regard to students in courses in home economics, domestic science, and homemaking.

The increasing need for highways to be constructed across country devoid of the need of difficult engineering feats, the growing demand for agricultural engineering, including the care and use of power machinery, etc., and for tradesmen possessed of a high degree of scientific knowledge and trained skill create a corresponding need and demand for courses of instruction in these subjects for large numbers of students, some of which courses at least should be of college grade. The large number of young men and women in the State who have not had high-school education and who will not attend college creates at least a temporary demand for serious and systematic instruction in agriculture, in the trades and industries, and in home economics in courses below college grade, much of which should be given in comparatively short courses and under conditions which will make attendance as inexpensive as possible.

The ideals and the educational and cultural traditions of the people of the State are responsible for the justifiable demand for a large element of cultural education in all these schools, but the need for special and professional courses in the fine arts, literature, and the languages does not appear to be sufficient to justify an attempt to give them at more than one place.

The commercial interests of the State are already sufficiently large to justify commercial courses of higher or lower grade in the university and the agricultural college, and the commercial nature of farming in this State creates a demand for courses in farm accounting in the agricultural college and possibly in the university, in the

schools at Wahpeton and Bottineau, and in the rural high schools. It also makes it desirable that simple farm accounting should be taught in the rural elementary schools. The normal schools should therefore offer instruction in this subject and in those simple forms of bookkeeping which relate to the home and to household affairs. There seems, however, to be no reason why the normal schools should give courses in those commercial branches that are not, and can not be, taught in the elementary schools.

To these purposes and tasks should the institutions herein considered adjust themselves in generous and hearty cooperation and with such division of work as will result in the greatest economy and the largest and most efficient service.

Chapter III.

THE UNIVERSITY OF NORTH DAKOTA.

The early interest of the people of North Dakota in higher education is shown by the fact that provision for a university was made by the Territorial assembly, February 23, 1883, more than six years before the Territory became a State (Special Session Laws of the Territorial legislature, ch. 40, secs. 13–15). These laws authorize the support and endowment of the university by means of a "university fund income and all other sums of money appropriated by any law to the university fund income of North Dakota."

The university thus provided for was located at Grand Forks, and first opened its doors to students on September 8, 1884. It is the oldest of the State's institutions for higher education. During the first year of the existence of the university its faculty consisted of four instructors: A president, who was professor of metaphysics; a vice president, who was professor of natural sciences; an assistant professor of Greek and Latin; and a preceptress and instructor in English and mathematics. It is said that all the 79 students of this year were below college grade. During the first seven years the teaching staff of the university increased to 13 and the number of students to 151.

From the beginning the university has been open to both men and women.

CONSTITUTIONAL PROVISIONS.

In November, 1887, the people of the Territory of Dakota voted in favor of the division of the Territory into the two Territories of North Dakota and South Dakota. In November, 1889, North Dakota, with boundaries as at present, became a State of the Union. The constitution of the State, adopted in 1889, provides for a system of public education. Article 19 of this constitution provides for the establishment of the State university and school of mines in the city of Grand Forks. The Revised Code of 1905 (ch. 10, sec. 1040) provides that "the University of North Dakota as now established and located at Grand Forks shall continue to be the university of the State." The same chapter records the provision for a board of five trustees, to be appointed by the governor of the State, to have charge of the affairs of the university, and outlines the powers and duties of

this board. This was the method of control of the university until the creation of the present State board of regents in July, 1915.

By the terms of the enabling act admitting the Territory to statehood, Congress granted the university 72 sections (46,080 acres) of public lands which had been reserved for university purposes in an act of February 18, 1881, and in addition thereto apportioned to it 40,000 acres of the 500,000 acres given to the State in lieu of grants provided in the acts of September 4, 1841, and September 28, 1850. The school of mines was granted 40,000 acres. Thus the total grant of land to the university through the enabling act was 86,080 acres, and the grand total to the university and the school of mines was 126,080 acres. Of this amount, by July, 1910, 89,567.82 acres had been sold for $1,163,324.26, and the portion paid in had been invested in such a way that, together with the interest at 6 per cent on unpaid land contracts and rentals and hay permits on unsold lands, it yielded an annual income of $65,026.09.[1]

Chapter 40 of the Special Session Laws of 1883 provided for a special annual appropriation of one-tenth of 1 mill for the support of the university. This appropriation was subsequently changed, as follows: In the Revised Code of 1899, two-fifths of 1 mill; in the Session Laws of 1907, thirty-three one-hundredths of 1 mill; in the Session Laws of 1913, two-fifths of 1 mill; in the Session Laws of 1915, a fixed sum, $102,720, was appropriated in lieu of the university's portion of the millage tax.

In the biennial period 1915 and 1916 the total income of the university from all sources and for all purposes, including the State public health laboratory and its branches, the mining substation, the biological station, and the geological survey, amounted to $400,743.55, of which $270,760 is classed as "educational."[2]

The growth of the university, like that of the State, has been rapid and sure. As already stated, the first faculty consisted of only 4 members, and only 79 students, all below college grade, were enrolled the first year; but during the first seven years of the life of the school the faculty increased to 13 and the student enrollment to 151. In 1915–16 the faculty contained a total of 168 members and the total enrollment of students was 1,241, of whom 675 were regular college students in residence. Of these, only a very few had entered with less than 15 units and none with less than 14. It is, however, quite evident that the influence of the university has not yet reached all parts of the State as it should. (See map, fig. 8, showing distribution of resident students.)

[1] See Report of the Temporary Educational Commission to the Governor and Legislature of the State of North Dakota, Dec. 27, 1912, pp. 31 and 32.

[2] See Appendix VIII, Table 48.

CAMPUS AND BUILDINGS.

The material growth of the university has, to some extent at least, kept pace with the increase in faculty and students, and the consequent demand for room and equipment. To the original small campus additions have been made by purchase and gift until it now contains about 120 acres. A dormitory for men was built in 1883, and a dormitory for women was authorized in 1887 and erected in

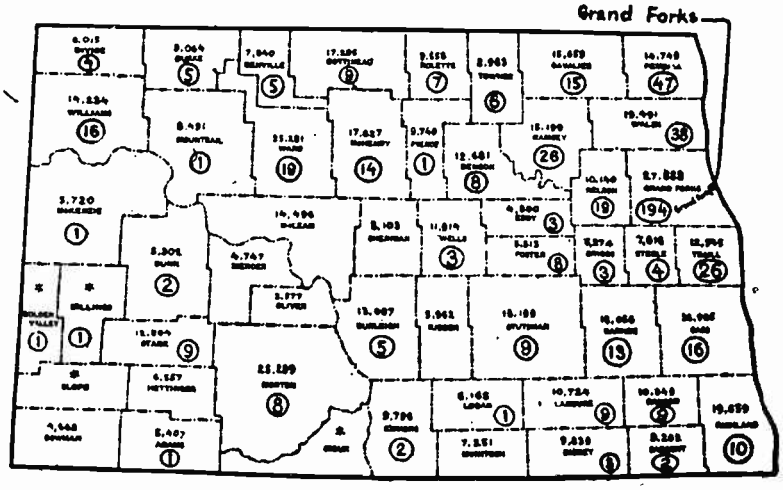

FIG. 8.—Distribution of resident students enrolled in the University of North Dakota, at Grand Forks, exclusive of summer sessions, 1914–15. (See Table 31, p. 136.)

The figures above the county name in each case give the population in 1910. At that date the population of Golden Valley County (later divided into Golden Valley, Billings, and Slope Counties) was 10,186; and the population of Morton County (later subdivided into Morton and Sioux Counties) was 25,289.

The figures inclosed in the circle in each case indicate the number of students from the county who are enrolled at the university.

This institution drew 583 students from 42 of the 52 counties in North Dakota (of whom 33.2 per cent came from Grand Forks County), and 104 from without the State; total, 687.

In 1910 the population of North Dakota was 577,056. Approximately 60 per cent of the population was found in that portion of the State located east of the western boundary lines of the Counties of Rolette, Pierce, Wells, Kidder, Logan, and McIntosh, which divide the State into two nearly equal parts, and 40 per cent was found in the portion west of this line; whereas, of the 583 North Dakota students in residence at the university, approximately 78 per cent came from the territory east of the line indicated, and only about 22 per cent from west of this line.

1889. On the campus at present are: Merrifield Hall, in which are located administration offices, study and recitation rooms, etc.; Science Hall, in which are located the departments of geology and mineralogy, physics, and biology, including special work of the school of medicine; the Mechanical Engineering Building, in which are located machine and forge shops, foundry, mechanical labora-

tory, woodworking shop, machine drawing, drafting and class rooms, library and offices; the Mining Engineering Building, devoted to the technical work of the college of mining engineering and to the university museum; Woodworth Hall, which houses the school of education, the model high school, and associated work; the Carnegie Library; the Gymnasium and Assembly Hall; the Commons Building; Davis Hall, a dormitory for women with rooms for the Women's League, literary societies, and amusement; Macnie Hall, a dormitory for women; Budge Hall, a dormitory for men; the president's house; and a power house containing central heating and lighting plants.

There is already need for other buildings, and as the work and attendance of the university grow still others will be needed. Here, as elsewhere, it is very important that all buildings should be located and erected after a definite plan, and that they should be built for permanency and with the future development of the institution in mind.

The library of the university, which contained less than 1,000 volumes the first year of the opening of the university, had grown by gift and purchase to 8,000 volumes in 1902, 30,000 volumes and pamphlets in 1908, and 55,843 volumes, including the 8,612 volumes of the law library, in 1916. It is added to at the rate of about 2,500 volumes annually. The Scandinavian collection of more than 3,500 volumes and the James J. Hill railway transportation collection are of special interest. Departmental libraries of biology and medicine, geology, physics, mechanical engineering, civil engineering, mining engineering, and chemistry are installed in the buildings with these departments.

There are laboratories for the biological department and the school of medicine; the public health laboratory; chemical, metallurgical, and mining laboratories; geological, mineralogical, and physical laboratories; mechanical engineering shops and laboratories; and surveying laboratories, all of which are constantly replenished with new apparatus. The university museum contains material for work in geology, zoology, and botany.

For the care of the sick, one room with bath is set aside in each residence hall, and a trained nurse maintains office hours daily. The hospitals of Grand Forks are also easily accessible, but, as the school grows, there will probably be need for a special building for an infirmary on the grounds.

DEPARTMENTS AND COURSES OF STUDY.

The few courses in philosophy, science, and language offered to students below college grade in 1884 have expanded until the cata-

logue of the university for 1915–16 lists the following colleges, schools, and divisions:

A. The College of Liberal Arts.
B. The Division of Education:
    The School of Education.
    The Model High School.
C. The School of Law (1900).
D. The Division of Engineering:
    The College of Mining Engineering (The School of Mines) (1900).
    The College of Mechanical and Electrical Engineering (1900).
    The Course in Civil Engineering (1913).
E. The Division of Medicine:
    The School of Medicine.
    The Course for Nurses.
    The Public Health Laboratory.
F. The Graduate Department.
G. The Summer Session.
H. The Extension Division:
    The Bureau of Educational Cooperation.
    The Bureau of Public Service.

In these departments more than 700 courses were offered in the announcement for 1915–16, exclusive of the model high school and the summer session. These courses, except for the division of medicine, the school of law, and the graduate department, are summarized briefly as follows:

In the *College of Liberal Arts*, astronomy, bacteriology and hygiene, biology (botany and zoology), ceramics, chemistry, commercial subjects, economics and political science, education, English language and literature, art and design, music, geology, German language and literature, Greek language and literature, history, home economics, Latin language and literature, law, library science, manual training and mechanical drawing, mathematics, metallurgy and industrial chemistry, philosophy and psychology, physical education, physics, physiology, French language and literature, Spanish language and literature, Italian language and literature, Scandinavian languages and literatures, sociology.

In the *School of Education*, special courses for the training of teachers in biology, chemistry, commercial subjects, arts and design, domestic science and art, English, French, German, history and civics, Latin, manual training, mathematics, music, physics, physiography, supervision and administration.

In the *Law School*, all the usual subjects of a first-class legal curriculum.

In the *School of Medicine*, in addition to the premedical subjects prescribed for the first two years, courses are given in the professional subjects of anatomy, general and special pathology, organic chemistry, embryology, advanced physiology, pharmacology, materia medica, physical diagnosis, surgery, hygiene and sanitation, dietetics, principles of nursing, hospital economics.

In the *School of Mines*, metallurgy, ore treatment and milling, industrial chemistry, building materials and masonry, mining engineering.

In the *School of Mechanical and Electrical Engineering*, descriptive geometry, mechanical drawing, shopwork, bridge design, sanitary engineering, mechanical engineering, electrical engineering.

In the *Course in Civil Engineering*, surveying, hydraulics, municipal engineering, water supplies.

In addition to the extramural work of the extension division through the bureau of educational cooperation and the bureau of public service, as stated elsewhere, the university also has under its immediate direction the public health laboratory at Grand Forks and its branches at Bismarck and Minot, the biological station at Devils Lake, the mining substation at Hebron, the State geological survey, the United States weather bureau at Grand Forks, and the bureau of public accountancy.

That the expansion of the work of the university has been affected by the growth of the State, and that the university has endeavored to meet all demands as they have risen, is shown by the number of additions made within the last seven years, since the inauguration of the present president—years that have also been years of rapid growth and development for the State. Among the additions are the following:

1909. The mining station at Hebron and the biological station at Devils Lake established.
The university quarterly journal established.
1910. A director of music appointed.
A department of ceramics established.
Courses for nurses inaugurated and a university nurse appointed.
Branches of public health laboratory established at Bismarck and Minot.
Medical school faculty enlarged.
University extension division organized.
Federal support obtained for weather bureau.
1911. Course in home economics inaugurated.
Course in art and design inaugurated.
Law course extended from two years to three years.
College section of summer session established.
1913. Course in civil engineering established.

In the meantime the preparatory school has been separated from the university and made into a model high school and practice school for the school of education, the graduate department has been developed, a five-year course in engineering has been inaugurated, fellowships and scholarships established, all faculties have been enlarged, material equipment of buildings and laboratories have been added to extensively, and plans for future development have been outlined. The chief danger has been that in the enthusiasm of youth and through the very laudable desire to respond to all demands of a new and growing State, new courses, divisions, and departments would be provided before the demands were sufficient to justify the expense and to the detriment of other work for which there was greater need. It is not the opinion of the survey commission that any of these should now be abandoned except possibly some minor divisions of specialized subjects for which there will probably not be much

demand at any time soon. For some work of this kind a new State like North Dakota should not attempt to provide. It is cheaper for the very few students who might be interested in these courses to go for them where they can be given in a more satisfactory manner, with better equipment and probably at less cost. It is important, however, that for the present and the immediate future, the energies of the university should be used in building up departments and courses already in existence.

THE COLLEGES.

The college of liberal arts offers four-year curricula leading to the degrees of bachelor of arts and bachelor of science.[1] The courses offered in economics and commerce, in connection with other subjects, provide a university training for business careers.

The school of education provides preparation for teaching, especially in secondary schools. It regularly requires for entrance two years of college work, and its courses of two years lead to the degree of bachelor of arts and the bachelor's diploma in teaching. The latter is valid in law as a first-grade professional certificate. The school of education also grants the teacher's certificate to those who complete two years of college work, academic and professional, above the high school, and this certificate is valid in law as a second-grade professional certificate. Special certificates in music, art and design, manual training, home economics, and commercial subjects are granted to those who have specialized in these lines and who have completed at least two years of college work.

The model high school is under the direction of the school of education and is used for observation and practice teaching, for the study of problems of secondary education, and as a model of high-school organization and instruction.

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[1] The revised code of 1905 provides for courses of instruction in the university as follows:

"SECTION 1051. *Courses of instruction.*—The college or department of arts shall embrace courses of instruction in mathematical, physical, and natural sciences, with their application to industrial arts such as agriculture, mechanics, engineering, mining and metallurgy, manufactures, architecture, and commerce; and such branches included in the college of letters as shall be necessary to properly fit the pupils in the scientific and practical courses for their chosen pursuits and in military tactics. In the teachers' college the proper instruction and learning in the theory and art of teaching and all the various branches and subjects needful to qualify for teaching in the common and high schools; provided, that all instruction in the teachers' college shall be above the grade of secondary schools, and as soon as the income of the university will allow, in such order as the wants of the public shall seem to require, the courses of science and their application to the practical arts shall be expanded into distinct colleges of the university, each with its own faculty and appropriate title. The college of letters shall be coexistent with the college of arts and philosophy, together with such courses or parts of courses in the college of arts as the trustees shall prescribe."

In other sections provision is made for instruction in Scandinavian languages, for a comprehensive geological survey of the State, for the tabulation of meteorological statistics and barometrical observations, for the making of official topographical and statistical maps of the State, and for the collection, preparation, and preservation of botanical, zoological, and mineralogical specimens for the university museum.

The school of law offers a three years' course of study, to which persons who are 18 years of age and graduates of high schools are admitted. The course leads to the degree of bachelor of laws. Students in the college of liberal arts are permitted to offer one year of law toward the degree of bachelor of arts. A graduate in liberal arts from a reputable college or university may receive the degree of Juris Doctor upon the completion of a three years' graduate course in law.

The college of mining engineering offers a four years' course for prospective mining engineers, surveyors, metallurgists, and manufacturing supervisors, leading to the degree of bachelor of science in mining engineering. A five years' course leads to the degree of engineer of mines.

The college of mechanical and electrical engineering offers four-year courses leading to the degrees of bachelor of science in mechanical engineering and bachelor of science in electrical engineering and five-year courses leading to the degrees of mechanical engineer and electrical engineer.

In connection with the colleges of mechanical and electrical engineering and mining engineering, a course in civil engineering is offered covering four years and leading to the degree of bachelor of science in civil engineering. A five years' course leads to the degree of civil engineer.

The school of medicine offers the first two years only of the medical course. The university has announced that the final two years of medical training will not be offered until the clinical facilities of the institution are adequate to meet the demands of advanced professional training in a satisfactory manner. When these are offered they should be of such nature as to prepare physicians for the rural communities of the State as well as for the more specialized work of the cities. Students are not permitted to begin the first year of medical work until they have completed two years of the liberal arts curriculum. During these two years special emphasis is placed on physics, chemistry, and biology. At the end of the four years the student receives the degree of bachelor of arts and a certificate showing that he has completed two years of the medical course. This certificate is accepted by medical colleges with which the university is affiliated.

The course for nurses, two years in length, offers instruction in the academic and technical subjects which precede the hospital work in the training of nurses.

The graduate department includes in a single organization the advanced work of all the colleges and departments of the university which offer courses leading to the higher degrees. The administration of the department is intrusted to a committee on graduate work,

under the general direction of the president. Graduate students are permitted to select major subjects only in the college of liberal arts or the school of education. The roster of students for the year 1915–16 contains the names of 12 students in the graduate department. Two degrees of master of arts and two degrees of master of science were conferred in June, 1915. It is stated that the university has thus far conferred but one degree of doctor of philosophy.

The summer session, six weeks in length, is organized in two sections, a college section and an elementary section. In the college section courses are offered in nearly all departments of the university, including special courses in library science, physical education, and fine arts, and credit is given toward university degrees. The elementary section is maintained strictly for the training of teachers. Courses in all the required certificate subjects are offered, as well as in home economics, manual training, agriculture, and music.

The extension division of the university has been instrumental in organizing lyceum entertainment and educational courses throughout the State, and in stimulating the demand for courses of better quality. During the year 1915–16 the division filled 430 lyceum dates, with an aggregate attendance of approximately 90,000 persons. For the year 1916–17 the number of courses booked is 121, with a total of 586 dates. Under this division are enrolled also 127 correspondence students. It also provides for the establishment and maintenance of conferences and community institutes in various parts of the State. The appropriation for this division is at present $2,500 annually.

Graduates of the University of North Dakota are admitted without conditions to the graduate schools of the leading universities of the country; the school of medicine of the university is listed in "Class A" by the American Council for the Advancement of Medical Education; the law school is a member of the Association of American Law Schools; a chapter of Phi Beta Kappa was established in the college of liberal arts of the university in 1914; and the university is included in the list of American universities recommended to the German Government for the admission of graduate students to foreign universities.

The organization of the university is quite elaborate and in one instance at least the division of authority seems to be extended too far. The survey commission can see no reason why there should be two deans in the division of engineering, one of the college of mining engineering and another of the college of mechanical and electrical engineering. The large number of elements common to all the branches of engineering given in the university and the small number of students in each branch make it all the more desirable that they should be united under one head. The commission has recommended elsewhere that all the engineering be put under the direction of a

single dean. The three branches should be merged into one college of engineering under the direction of a dean who shall have under him heads of the different branches.

The fact that the president of the university is a member ex officio of the State high-school board, that the annual high-school conference has been held at the university since 1901, and that the inter-scholastic athletic meets have been held since 1903, have all served to bring together the university and the high schools of the State and to identify their interests. Laboratories and branch laboratories, the substation of the school of mines at Hebron, the university extension work, the work which the university does through the United States Weather Bureau, and more recently through the radio station, not only help the university to serve better and more fully the people of the State, but they have tended also to bring the university and the people closer together and to keep alive the interest of each in the other.

AFFILIATED COLLEGES.

In 1906 the policy of affiliation with other colleges was inaugurated by the location of Wesley College on a campus opposite the campus of the university and by making provision for an exchange of credits on the usual collegiate basis.

This policy seems to be in the interest of true economy and efficiency and to be worthy of extension. It is commended to State universities and denominational colleges of other States. Through this arrangement students of the denominational college receive the full advantage of opportunities for instruction offered by the university which the college might not be able to offer, and those who attend the university may do so without being deprived of the religious teaching and fellowship of a denominational college.

SALARY SCHEDULE.

Members of the teaching staff and administrative officers are employed in different ways. Full professors are appointed permanently, associate professors are appointed for five years, assistant professors for three years, instructors for one year. The general schedule of salaries is as follows:

Deans	$3,000 to $3,500
Full professors	2,500 to 3,000
Associate professors	2,000 to 2,500
Assistant professors	1,400 to 2,000
Instructors	900 to 1,500

The general policy of the university relative to salary schedules is as follows: That instructors shall receive an increase of pay up to $1,500 at the rate of $100 a year. The same shall be true of other

grades of appointment; that is, assistant professors shall have an increase at the rate of $100 a year up to $2,000, etc. It has not been possible to hold regularly to this schedule, due to the fact that the increase in the income of the university has not been sufficiently large to maintain it. In 1905 the dean having the highest salary received $2,500; in 1915 the highest amount paid was $3,200 and the dean having the lowest salary received $2,900. In 1905 the highest paid professor received $2,000 and in 1915, $3,000. In 1905 the highest paid instructor received $1,200 and the lowest paid, $400. In 1915 the highest paid instructor received $1,500 and the lowest paid, $1,100.

Salaries paid at the university have been reasonably liberal as compared with other institutions in this section, but it is evident that the best interests of the university will demand larger salaries and especially a larger number of professors and associates of the higher grades.

Chapter IV.

THE NORTH DAKOTA AGRICULTURAL COLLEGE.

The first legislative assembly of the State of North Dakota established the North Dakota Agricultural College by an act of March 2, 1890, by accepting the provisions of the Morrill Act of July, 1862. The college, which had been located at Fargo by provision of the State constitution, adopted in 1889, was organized immediately and opened, in rented quarters, October 15, 1890.

LEGAL PROVISIONS FOR THE ESTABLISHMENT OF THE NORTH DAKOTA AGRICULTURAL COLLEGE.

The purpose of the school and the character of its work were set forth by the legislature as follows (section 1106, Revised Code of 1905):

SECTION 1106. *Course of instruction.*—The object of such college shall be to afford practical instruction in agriculture and the natural sciences connected therewith, and in the sciences which bear directly upon all industrial arts and pursuits. The course of instruction shall embrace the English language and literature, military tactics, civil engineering, agricultural chemistry, animal and vegetable anatomy and physiology, the veterinary art, entomology, geology, and such other natural sciences as may be prescribed, political, rural, and household economy, horticulture, moral philosophy, history, bookkeeping, and especially the application of science and the mechanic arts to practical agriculture. A full course of study in the institution shall embrace not less than four years, and the college year shall consist of not less than nine calendar months, which may be divided into terms by the board of trustees as in its judgment will best secure the objects for which the college was founded.

The Morrill Land-Grant Act of July 2, 1862, under the provisions of which the North Dakota College of Agriculture was established, thus defines the character and scope of instruction intended:

The leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the States may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life.

By the Session Laws of 1890, chapter 160, section 3, the management of the agricultural college was vested in a board of seven trustees, appointed by the governor for terms of two and four years.

all subsequent appointments to be for four years. The powers and duties of the board are outlined in section 6 of the same chapter. This method of control continued in force until the creation of the present State board of regents, in July, 1915.

The following sections of chapter 160 of the special laws of 1890 are of special interest in this study:

SECTION 11. *Duties of president.*—The president shall be the chief executive officer of the college, and it shall be his duty to see that all rules and regulations are executed, and the subordinate officers and employees not members of the faculty shall be under his direction and supervision.

SEC. 12. *Faculty to make annual report to board.*—The faculty shall make an annual report to the board of trustees on or before the first Monday of November of each year, showing the condition of the school, experiment station and farm, and the results of farm experiments, and containing such recommendations as the welfare of the institution demands.

EXPERIMENT STATION.

The establishment of the agricultural experiment station provided for in section 16, chapter 160, Session Laws of 1890, is reaffirmed in the Revised Code of 1905 and in the Compiled Laws of 1913, as follows:

SEC. 1619. *Experiment station.*—The agricultural experiment station heretofore established in connection with the agricultural college is continued, and the same shall be under the direction of the board of trustees of such college for the purpose of conducting experiments in agriculture according to the provisions of section 1 of the act of Congress approved March 2, 1887, entitled "An act to establish agricultural experiment stations in connection with the colleges established in the several States under the provisions of an act approved July 2, 1862, and of the acts supplementary thereto."

FEDERAL ENDOWMENT AND SUPPORT.

At the time North Dakota was admitted to the Union, November 2, 1889, 90,000 acres of land were set aside through the provisions of the Morrill Act of 1862, for the benefit of the agricultural college, and, by the enabling act, an additional 40,000 were for the same purpose provided, making a total of 130,000 acres.

By a wise provision of the enabling act, none of this land can be disposed of for less than $10 an acre. Up to this time (1915) the average sale price has been about $13. At this rate this land will afford the agricultural college an endowment considerably in excess of $2,000,000.

In 1890, Senator Justin S. Morrill secured an additional appropriation for the strengthening of the land-grant colleges. Beginning that year, $15,000 was granted to each State and Territory for the maintenance of its agricultural and mechanical college, and that

sum was increased $1,000 each year until a maximum of $25,000 annually was reached. This maximum was reached in 1900.

The second Morrill Act, of 1890, providing for the further endowment of agricultural colleges, secures for the college of each State an annual income "to be applied only to instruction in agriculture, the mechanic arts, the English language, and the various branches of mathematical, physical, natural, and economic science, with special reference to their applications in the industries of life and to the facilities for such instruction."

The Nelson amendment of 1907, for the further endowment of agricultural colleges, provides "that said colleges may use a portion of this money for providing courses for the special preparation of instructors for teaching the elements of agriculture and the mechanic arts."

Under the Nelson amendment of 1907, which went into effect with the fiscal year ending June 30, 1908, the Federal appropriation of $25,000 for the agricultural college was increased by the sum of $5,000 annually until the total income arising from the Morrill-Nelson fund amounted to $50,000 annually.

The act of 1888 authorizes the President to detail an officer of the Army or Navy to act as professor of military tactics, and the Secretary of War to issue out of ordnance and ordnance stores belonging to the Government such equipment as may appear to be required for the military instruction of the students of the college.

The Hatch Act of 1887, establishing agricultural experiment stations in connection with agricultural colleges, provides:

SEC. 1. That in order to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science, there shall be established under direction of the college or colleges or agricultural department of colleges * * * a department to be known and designated as an "agricultural experiment station."

SEC. 2. That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies of the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under the varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test the comparative effects on crops of different kinds; the adaptation and value of grasses and forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective States or Territories.

The Adams Act of 1906, providing for the further endowment of agricultural experiment stations, stipulates that none of the annual appropriations from Congress for agricultural experiment stations "shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation, or repair of any building or buildings, or to the purchase or rental of land."

The total sum, $30,000, thus received from Congress for the North Dakota experiment station must be used for the development and diffusion in North Dakota of agricultural knowledge. Only 5 per cent of the total sum may be used for any other purpose.

The Smith-Lever Act of 1914 provides for extension work as follows:

> That cooperative agricultural extension work shall consist of 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; and this work shall be carried on in such manner as may be mutually agreed upon by the Secretary of Agriculture and the State agricultural college or colleges receiving the benefits of this act.

The act further provides that no portion of the moneys received for extension work—

> shall be applied, directly or indirectly, to the purchase, erection, preservation, or repair of any building or buildings, or the purchase or rental of land, or in college-course teaching, lectures in colleges, promoting agricultural trains, or any other purpose not specified in this act, and not more than five per centum of each annual appropriation shall be applied to the printing and distribution of publications.

The act making appropriations for the United States Department of Agriculture for the year ending June 30, 1915, provides for franking privilege in connection with the Smith-Lever Act.

TOTAL ANNUAL INCOME FROM NATIONAL GOVERNMENT.

In addition to the income from land grants, the North Dakota Agricultural College receives from the United States Government for the support of the agricultural college annually, $59,000; for the support of the experiment station, annually, $30,000; for extension work, Smith-Lever Act, for the year ending June 30, 1915, $10,000; total, $90,000.

The sum received from the Government for extension work will be increased from year to year until 1922, when $52,607 will be received, provided the proportion that the rural population of North Dakota bears to the total rural population of the United States remains as it is at present. In 1922, therefore, North Dakota will be receiving from the General Government for the support of the agricultural college in its several departments approximately $132,000 annually.

STATE SUPPORT.

The Legislative Assembly of North Dakota has appropriated funds for the establishment and maintenance of the agricultural college and experiment station from time to time as follows:

1891, $25,000 for the erection of an administration building.

1893, $55,000 for additional buildings and maintenance, which provided the Mechanics Art Building, the men's dormitory, now Francis Hall, the farm house, and a barn.

1895, $11,250 for miscellaneous expenses.

1897, $22,000 for buildings and maintenance; a wing to a proposed chemistry laboratory was constructed, which was later moved to another site, remodeled, and used as a music hall; $5,000 to cover a deficiency.

1899, $27,000 for maintenance, and for a small addition to the Mechanic Arts Building.

1901, $18,000 for maintenance.

Authority to issue bonds in the sum of $50,000, from the proceeds of which the south wing of Science Hall was built, also two barns to replace one that had burned the preceding winter; and a sewage system was installed.

Permanent income for maintenance was established by an act appropriating annually one-fifth of 1 mill tax upon the taxable property of the State.

1904, $15,000 to apply on installation of a new heating plant was authorized by the emergency board.

1905, $50,000 for the erection of a chemical laboratory. Gift of $18,400 from Andrew Carnegie for a library building.

1907, $108,000, of which $65,000 was used for the construction of an engineering building, $6,000 for a greenhouse, $10.000 for a seed barn and root cellar, $2,500 for an implement shed; the administration building was remodeled also, and the armory was remodeled and enlarged.

1909, $75,000 for the erection of a women's building, Ceres Hall; $30,000 for a veterinary science building; $12,000 for equipment, engineering laboratories; $10,000 for an electric-light plant; $3,000 for sidewalks.

1911, $65,000 for a chemical building, to replace the laboratory destroyed by fire in 1909; $40,000 for the completion of Ceres Hall; $15,000 for the purchase of additional land for the college farm.

In 1911 the legislative assembly established a permanent appropriation of $25,000 annually for the support of the agricultural college and experiment station. In 1915 there was apportioned to the college $61,800 out of the annual tax of $347,880 which was levied for the maintenance of the State educational institutions.

The income from the State for maintenance, for the year ended June 30, 1915, was $203,642.10; from "local receipts," $135,740.35; from the Federal Government, $90,000; total, $429,382.45.

Up to June 30, 1915, the total amount expended for buildings was $554,800; for equipment, $315,730. The institution has in campus and grounds 953.8 acres.

SUBSTATIONS, SPECIAL FUNDS, AND REGULATORY WORK.

In addition to the experiment station, the substations, and the enterprises usually committed to such institutions, the State of North

Dakota has created a number of special funds, investigations, and responsibilities, the administration of which is lodged with the agricultural college and experiment station at Fargo. These special funds, together with the provisions for the several substations, may be briefly summarized according to the provisions of the compiled laws of 1913, the date of the original enactment in each case being indicated in parentheses:

Section 1621 provides an annual appropriation of $5,000 for the maintenance of the subexperiment station at Edgeley, which is charged with the study of "agricultural, horticultural, and other problems peculiar to districts of the State where the soil and climatic conditions differ from those of that portion of the State known as the Red River Valley." (1903.)

Section 1622 provides an annual appropriation of $10,000, to be used for the further and better enforcement of the food laws, drug laws, formaldehyde and Paris green laws, the paint laws, and "such other food or drug laws as the said station may be charged with the enforcement of" by the legislature, and also for the dissemination of information through bulletins and reports. (1907.)

Section 1623 provides an annual appropriation of $12,000 for the purpose of continuing the 12 demonstration farms already established, for the establishment of not less than 6 nor more than 12 additional demonstration farms, for publishing the annual report of the demonstration farms and of the experiment stations and for printing additional bulletins, and "for complying with the provisions of the pure-paint law, Paris-green law, and formaldehyde law now on the statute books, and for making analysis of fertilizers and stock foods and for other experimental purposes."

It is provided further that $2,000 of this amount shall be set aside for the sole purpose of installing and conducting demonstration farms near the village of McLeod "for making additional experiments with cereals, root crops, and tree culture, and for making experiments in the manufacture of denatured alcohol from by-products of the farm." (1909; supersedes an act passed in 1907.)

Section 1624 provides an annual appropriation of $12,000 "for the enforcement of the feeding stuffs, fertilizers, beverage and sanitary inspection laws, and such other enacted inspection laws as the food commissioner of this State may be authorized to enforce," and for the making of such investigations and the publishing of such bulletins and reports as are deeemed necessary. Section 2920 provides that the "director of the North Dakota Government Agricultural Experiment Station, or his agent or deputy," is charged with the enforcement of the provisions of the laws referred to herein. (1907.)

Section 1625 provides that it shall be the duty of the experiment station at Fargo "to conduct experiments and determine the comparative milling values of the different grades and kinds of cereals and baking tests of the flours made therefrom," and to obtain, tabulate, and publish such other information with reference to cereals and their products as may be of value to the residents of the State. (1909.)

Sections 1626, 1626a, 1626b provide appropriations for the work specified in section 1625, as follows: Six thousand dollars for building and equipment (1907); $5,000 for additional equipment, purchasing and collecting samples of cereals, gathering information, and employing investigators (1909); $500 annually for maintenance of plant. (1907.)

Sections 1627 and 1628 provide an appropriation of $10,000 for establishing and conducting "an agricultural and grass experiment station," to be located at

or near Dickinson, on condition that a suitable area of land not less than 160 acres be donated free of charge. The purpose of this station is to make experiments with native and other grasses and forage products as well as other agricultural products, "with a view of improving and enlarging the supply of forage of said district and extending and increasing the agricultural products thereof." One additional member of the board of trustees of the agricultural college and experiment station at Fargo is provided for, whose "authority on said board shall be limited to the considering of matters affecting the substation provided for in this article." (1905.)

Sections 1629 and 1630 provide for establishing and conducting "an irrigation and dry-farming experiment station," to be located at or near Williston, under conditions similar to those prescribed for the station at Dickinson, including the appointment of an additional member of the board of trustees of the agricultural college and experiment station at Fargo. (1907.)

Section 1631 provides for an initial appropriation of $4,000, and an annual appropriation of $3,000 thereafter, for establishing and maintaining the substation at Williston. (1907.)

Section 1632 provides an additional appropriation of $500 for each of the years 1909 to 1918, inclusive, "for the payment of the charges for water for irrigation, including construction, operation, and maintenance charges," for the substation at Williston. (1909.)

Sections 1633, 1634, and 1634a provide for an appropriation of $10,000 for the purpose of establishing and conducting "an agricultural and grass experiment station," to be located at or near Hannah or Langdon, under conditions similar to those prescribed for the substation at Dickinson, including the provision for an additional member of the board of trustees of the agricultural college at Fargo. (1907.)

Section 1635 provides that the subexperiment stations located at Dickinson, Williston, and Langdon, and such other agricultural subexperiment stations as may hereafter be established by law, shall be operated in connection with the North Dakota government experiment station at Fargo, and "under the exclusive management and control of the board of trustees of the agricultural college." (1909.)

Sections 1636 and 1637 outline the duties of the superintendents of the subexperiment stations, and provide for biennial reports by the superintendents "to the president of the agricultural college," which reports are to be kept separate and included by the board of trustees with its biennial report to the governor. (1907.)

Section 1638 provides an annual appropriation of $15,000, to be divided as follows: $5,000 annually for the support and maintenance of each of the three substations located at Dickinson, Williston, and Langdon. (1909.)

Sections 1639 and 1640 provide for the establishment of an agricultural experiment station at or near Harvey, "to make experiments with native and other grasses and forage products, as well as other agricultural products." (1909.)

Sections 1641 and 1642 provide for the establishment of "an agricultural, grass, and tree experiment station," to be located on the grounds of the State Reform School at Mandan, "provided, that all necessary labor in connection with said experiment station, except the services of an expert, shall be performed by the boys of the said reform school under the supervision of the officers of said school, and all surplus products of said experiment station shall apply on the maintenance of said reform school." (1909.)

Sections 1643 and 1644 provide an appropriation of $10,000 for establishing and conducting an agricultural experiment station at or near Hettinger, "to make experiments with native and other grasses and forage products, as well

as other agricultural products," on conditions similar to those prescribed for the experiment station at Dickinson, except the provision for an additional member of the board of trustees of the agricultural college at Fargo. (1909.)

Sections 1657 and 1661 provide an annual appropriation of $3,000 for the establishment and maintenance of a "serum institute" at the agricultural college and experiment station, to be under the control and regulation of the board of trustees of the same. The professor of veterinary science is to be the director of the serum institute. (1909.)

Sections 1658 and 1659 outline the duties of the director of the serum institute: "To manufacture or cause to be manufactured vaccines, sera, and other agents for the prevention, eradication, cure, and control of tuberculosis, glanders, hog cholera, blackleg, and other infections or contagious diseases," and to distribute to residents of North Dakota, free of charge, the products referred to, under such conditions as may be prescribed by the live-stock sanitary board. (1909.)

Sections 1663, 1664, 1665 provide that the board of trustees of the North Dakota Agricultural College may cooperate with, and accept the cooperation of, the directors of the Federal surveys "in executing a topographic, economic, and agricultural survey and map of North Dakota," including also the collection of samples of all kinds of material and products of economic or scientific interest discovered during the surveys to be placed on exhibition in the museum of the agricultural college. (1901.)

Sections 1666, 1667, 1668 provide for publication of the maps and reports resulting from the survey, and for biennial reports to the governor on the progress of the work. (1901.)

Section 1670 provides for an annual appropriation of $1,000 for the work of the survey. (1901.)

Sections 1669, 1671, 1672 provide that the professor of geology of the North Dakota Agricultural College shall act as State director of this survey; that "this survey shall be known as the Agricultural College Survey of North Dakota," and that "this act is not to be construed as conflicting in any manner with or repealing the geological survey of North Dakota already established at the State university." (1901.)

COURSES OF INSTRUCTION.

The act establishing the agricultural college specified certain courses of instruction which should be offered, but when the college opened, in 1891, formal curricula were not immediately provided. The following subjects, which were later organized into courses of study, were taught: "Household economics, agriculture, chemistry, veterinary science, horticulture and forestry, botany, zoology, mechanics, mathematics, language, history, geography, geology, and military tactics." The first catalogue was issued for the year 1892–93.

The first real course of study formulated was known as the "general science course," and enabled students by election to specialize in chemistry or biology, as well as agriculture.

The list of courses of instruction announced for 1915–16 includes the following:

Division of Applied Agriculture.—Farm management, breeding, genetics, farm practices.

Division of Agronomy.—Farm crops, soil physics and management, soil fertility, crop production, methods of investigation.

Division of Animal Husbandry.—Judging live stock, breeds of live stock, feeds and feeding, animal nutrition, care and management, herd-book study.

Division of Dairy Husbandry.—Elements of dairying, buttermaking, ice cream, cheese making, dairy cattle and milk production, city market-milk supplies.

Division of Botany and Plant Pathology.—Seed analyses and seed testing, plant physiology and pathology, advanced botany and investigation, elementary pharmaceutical botany, botany (elements and structural).

Division of Zoology and Physiology.—Zoology foundations, embryology, animal histology, cytology, and microscopic anatomy, animal parasites, advanced vertebrate embryology, human physiology, advanced comparative physiology, economic zoology investigation.

Division of Bacteriology.—Bacteriology, pathogenic bacteriology, soil biology, dairy bacteriology, bacteriology of water and sewage, soil bacteriology.

Division of General and Historical Chemistry.—General chemistry, experimental chemistry, inorganic chemistry, qualitative chemistry.

Division of Agricultural Chemistry.—How crops grow, soils and feeding of plants, chemistry of soils, dairy chemistry.

Division of Quantitative, Organic, and Physical Chemistry.—Elementary quantitative chemistry, quantitative analysis, organic chemistry, organic preparations, physical chemistry.

Division of Food and Physiological Chemistry.—Veterinary chemistry, physiological chemistry, sanitary chemistry, chemistry of plant and animal life, toxicology and urinology, inorganic constituents, chemistry of food materials, food chemistry.

Division of Industrial Chemistry.—Industrial chemistry for engineers, inorganic industrial chemistry, organic industrial chemistry, technological analysis.

Division of Pharmacy.—Theory and practice of pharmacy, operative phar-

Division of Pharmacy.—Theory and practice of pharmacy, operative pharmacy and pharmaceutical preparations, pharmacopœial preparations, volumetric methods, alkaloidal analysis, pharmaceutical testing, prescription reading and writing and incompatibilities, prescription practice, drug assaying, United States Pharmacopœia and National Formulary, pharmaceutical research, veterinary pharmacy.

Division of Materia Medica and Therapeutics.—Materia medica, materia medica and therapeutics.

Division of Pharmacognosy and Pharmaceutical Problems.—Pharmacognosy (inorganic drugs), study of organic drugs, pharmaceutical and chemical problems, pharmaceutical Latin.

Department of Education.—History of education, psychology, childhood and adolescence, principles of teaching, agricultural and industrial education, education in the United States and educational administration, educational investigations, observation and practice, school law, the high school, education and society, rural education, current educational literature.

Division of Mechanical Engineering.—Wood shop, forge shop, machine shop, mechanical drawing, descriptive geometry, mechanical perspective, machine design, pattern shop, molding, internal-combustion engines and gas producers, manual training, testing laboratory, gas engineering, steam engineering, mechanism, mechanics of materials, analytical mechanics, materials of construction, heat engines, thermodynamics, electric machines, refrigeration and pneumatic machinery.

Division of Physics.—College physics, household physics.

Division of Civil Engineering.—Surveying, surveying for agricultural students, civil engineering drawing, land surveying, topographic surveying, railroad curves and earthwork, roads and pavements, railroad engineering, graphic statics, details, hydraulics, masonry construction, water-supply engineering, bridge stresses and details, bridge design, sewerage, engineering contracts and specifications, concrete and drainage for agricultural students, water purification, sewage disposal and sanitation, reinforced concrete design.

Division of Architecture and Architectural Engineering.—Elements, water color, free-hand drawing, architectural design, building construction and superintendence, clay modeling, history of architecture, plumbing, history of sculpture and painting, professional practice and inspection, railroad structures.

Free-hand Drawing and Industrial Art.—Elementary drawing, free-hand drawing, water color.

Department of English and Philosophy.—Exposition, argumentation, history of English literature, Milton, introduction to the drama, prose fiction, Wordsworth, Tennyson and Browning, essays, English scientific writers, advanced English composition, playwriting, logic, introduction to philosophic problems, ethics.

Department of Geology and Mineralogy.—Dynamic, physiographic, and structural geology, historical geology, economic and applied geology, practical field methods, formation of soils, glacial geology, descriptive mineralogy, determinative mineralogy and blowpipe analysis, metallurgy and assaying, meteorology, and climatology.

Department of History and Social Science.—Economic and social history of the United States, survey course in the history of agriculture and closely allied industries, agrarian history of the United States, history of Greek civilization and art, modern industrial history, American government and citizenship, sociology, political economy, rural sociology, current events, principles of cooperation, rural economics.

Department of Home Economics.—Food preparation, home architecture, foods and economic problems of food supply, economic uses of food, household management, therapeutic diet, dietetics, presentation of domestic science, theory and practice of teaching, social observances, household hygiene and sanitation, home nursing, institutional management, domestic art, drafting, undergarment making, dressmaking, millinery, textiles, presentation of domestic art, house decoration, domestic art design, art needlework.

Physical Training for Women.—Hygiene.

Department of Horticulture and Forestry.—Plant propagation, principles of plant culture, advanced general gardening, plant growth and improvement, landscape gardening, forestry, entomology, floriculture.

Department of Mathematics.—Descriptive astronomy, higher algebra, plane trigonometry, analytical geometry, differential calculus, integral calculus, biometry, slide rule, graphs, differential equations, mathematics of investment.

Department of Military Science and Tactics.—Target practice, military tactics.

Department of Modern Languages.—German: Grammar, reading and composition, modern prose, Schiller, comedies, Goethe, modern drama, Faust, Heine and the romantic school, modern fiction, lyric poems, scientific German, masterpieces in German literature, history of German literature. French: Grammar, reading and composition, modern prose, modern comedies, classic dramas, modern fiction, modern drama, lyric poems, journalistic French, history of French literature.

Department of Music.—Harmony, theory, musical history. Organizes cadet band, college orchestra, boys' glee club, girls' glee club, mixed chorus.

Department of Physical Training and Athletics.—Directs the athletic sports, and conducts classes in physical training.

Department of Public Discussion and Social Service.—Elementary public speaking, forensics, debate, ex tempore speech, community programs, dramatics; supervision of numerous literary contests.

Department of Veterinary Science.—Veterinary science, practical pathology and bacteriology, animal pathology, anatomy, hygiene, materia medica, pharmacy, physiology.

Agricultural and Manual Training High School.—Four-year high-school courses designated as follows: (1) Agriculture. (2) General science, (3) Mechanic arts, (4) Curriculum for rural teachers.

(1) Agriculture, (2) General science, (3) Mechanic arts, (4) Curriculum for rural teachers.

Industrial and Special Curricula.—The following special short courses are announced:

Names of courses.	Weeks in term.	From—	To—	Years required.
Farm husbandry	22	Oct. 11	Mar. 23	3
Homemakers'	22	...do...	...do...	3
Power machinery	22	...do...	...do...	3
Winter short courses	10	Jan. 2	Mar. 6	1
Pharmacy	36	Sept. 20	June 13	2
Draftsmen and builders	22	Oct. 11	Mar. 23	2

[1] Or more.

Department of College Extension.—Lists the following activities: Industrial contests, boys' and girls' institute, high-school lecture course, extension schools, public school cooperation, press service, assisting in organization of farmers' clubs or business associations, exhibits, package libraries.

SUMMARY OF CHRONOLOGICAL DEVELOPMENT.

The development of certain important features of the work of the agricultural college is set forth in the following summary:

1891. The North Dakota Agricultural College opened October 15, offering instruction in the following subjects: Household economics, agriculture, chemistry, veterinary science, horticulture and forestry, botany, zoology, mechanics, mathematics, language, history, geography, geology, military tactics.

1893. Four-year course in agriculture announced.

1896. Four-year course in mechanics announced. Prior to this date elective courses in wood shop and machine shop were offered as parts of a general course of study leading to the B. S. degree.

1897. Four-year course in mechanical engineering announced.

1898. Two-year course in steam engineering offered; separate organization of department of dairying.

1899. Department of history and social science organized, with one instructor in history and civics.

1902. Courses in pharmacy offered.

1908. Organized first two years of four-year course in veterinary medicine and surgery; department of education organized; course in civil engineering announced; two-year course in power machinery announced; agricultural

students allowed to specialize in (1) agriculture, (2) agronomy, or (3) animal husbandry; department of public discussion and social service organized.

1909. Teachers' course added under course in agriculture.

1910. Course in chemical engineering announced.

1912. Short course in architecture announced; course in agricultural engineering announced.

1913. Two-year course for builders and contractors announced.

1914. Course in architectural engineering announced.

1915. Course in agricultural engineering transferred from department of agriculture to department of engineering and physics; two-year and four-year courses in pharmacy organized.

SUBSTATIONS, FARMS, ETC.

The long list of substations, experiment farms, surveys, and regulatory work provided by laws already cited make the field of operation of the agricultural college as wide as the State.

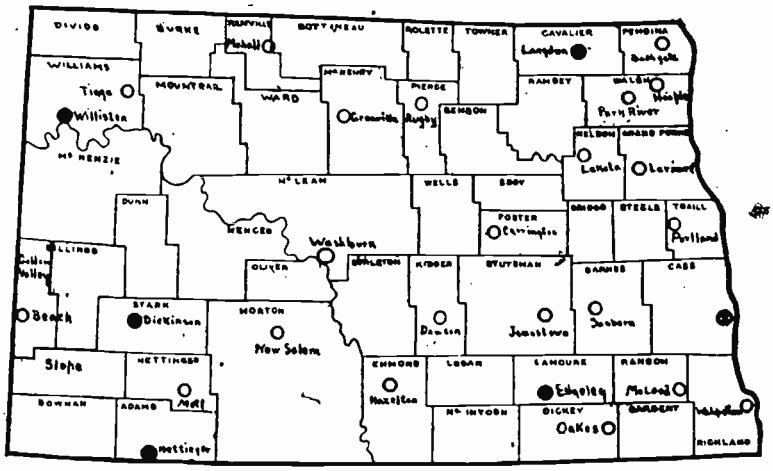

FIG. 9.—Demonstration work under the direction of the North Dakota Agricultural College.

○ Demonstration farms.
● Substation.
⊗ Experiment station.

In addition to the experiment station at Fargo, there are five substations—Williston, Dickinson, Hettinger, Langdon, and Edgeley—each having $5,000 a year for its support. There are also 22 demonstration farms located at the following places: Bathgate, Beach, Carrington, Dawson, Granville, Hazleton, Hoople, Jamestown, Larimore, Lakota, McLeod, Mohall, Mott, New Salem, Oakes, Park River, Portland, Rugby, Sanborn, Tioga, Washburn, and Wahpeton. (See fig. 9.)

It is only a question of time when, under the provisions of the Smith-Lever bill, there will be an agricultural agent for each county in the State.

In the institutional farm at Fargo there are 953.8 acres, divided as follows:

	Acres.
Farming purposes	701.0
Roads, fences, and right of way	40.0
Campus	40.2
Barns, yards, and farm buildings	50.0
Experimental plats	97.0
Garden and arboretum	25.6
Total	953.8

The 29 buildings at Fargo, including barns and sheds, have cost approximately $555,000; the value of equipment is estimated at $315,730; the annual income from all sources for the year ended June 30, 1915, was $429,382.45.[1]

The total income from producing lands to June 30, 1915, was $1,263,146.61.

ORGANIZATION.

It is explicitly provided in the laws establishing the North Dakota Agricultural College and Experiment Station, cited herein, that administrative authority for the entire institution is vested in the board of trustees, whose chief executive officer is the president of the college. During the early years of the institution, therefore, the president of the college was recognized as director of the experiment station also.

A department of college extension was organized by the faculty in 1910, which was formally recognized by vote of the board of trustees October 11, 1911. The legislative assembly of 1913 legalized the department of agricultural extension, and appropriated $20,000 for its maintenance for the following biennium. Although the governor vetoed the appropriation, the veto did not repeal the law establishing the department, and it was continued through the use of college funds for its maintenance.

The sections of the law relating to the faculty recognize the "institution" as embracing all college activities, including "the experiment station farm and results of farm experiments"; and all members of the station staff, as well as of the instructional force, are included in the term "faculty."

REORGANIZATION.

During the year 1911 the Better Farming Association was organized and financed by the lumber, elevator, railroad, and banking interests of Minnesota and North Dakota. The association was under

[1] For detailed statement of all these items, see Appendix V, Table 45, and IX, Tables 49–51.

the control of a board of directors, 21 in number, mostly North Dakota bankers.

On January 1, 1914, an arrangement was effected between the board of directors of the association and the board of trustees of the agricultural college by which the Better Farming Association was merged with the agricultural experiment station, and the secretary of the association became the director of the experiment station. The agreement between the two boards provided that the enterprises inaugurated by the Better Farming Association "shall be vigorously carried on in substantially the same manner and with no material curtailment" under the control of the director of the experiment station, "who shall be accountable only to the board of trustees of the North Dakota Agricultural College and Experiment Station, and such director shall also be in supreme charge of" the extension work and allied institutions started by the association.

It was further agreed that "the extension department of the institution shall be placed in the experiment station and that the director of the experiment station shall be made ex officio chief of said department or division," and that in administering the activities of the extension division the director shall be responsible only to the board of trustees of the college.

It appears, therefore, that there is now no official relationship between the college and the station, save that both are under the control of the same board. The organization provides for a president of the college and a director of the experiment station and extension division, coordinate in rank but with no mutual responsibilities. The existing arrangement is clearly not in accord with the meaning and evident intent of fundamental State law.[1]

The agricultural experiment station is the research department of the agricultural college, and the relation of the director of the experiment station to the president of the institution should be coordinate with that of the dean of agriculture.

There should be created the position of director of the extension division, coordinate with that of dean of agriculture, and that of director of experiment stations.[2] The extension work in North Dakota, as in other States, must grow in magnitude and importance.

[1] Since the date of the commission's investigation the plan of organization outlined above has been changed to comply with the law.

[2] The following extract from the Yearbook of the Department of Agriculture (1913) indicates that the authorities of agricultural colleges will find it necessary to coordinate the work of the experiment station and the extension organization:

"The institutions have created separate divisions or services and have brought under them all extension work in agriculture and home economics. Some of these divisions are not yet as clear-cut as they should be. In some cases laws or general administrative regulations adopted years ago have continued a confusing union of the extension organization with the experiment station. In 36 States a separate officer is in charge of the work, usually with the title of director; in 2 this officer also is head of the experiment station or of the college of agriculture."

It will have a profound influence upon the experiment station itself, since the more the knowledge of scientific agriculture is extended among the farmers of the State, the more they will become interested in research problems.

According to the 1915 Report of the Secretary of Agriculture, 36 States have separate officers in charge of the extension work, usually with the title of director. In 9 States only is this officer also the head of the experiment station or of the college of agriculture.[1]

The extension work, therefore, is important enough and great enough to demand the entire time of an able scientist who is fitted by experience and training to bring to the farmers of the State the latest practical results of agricultural investigations, whether conducted in North Dakota or elsewhere. This officer should be in close touch with the director of the experiment station, the dean, and the president of the agricultural college, and also with the normal schools, the agricultural high schools, the granges, and other organizations of farmers, and all those engaged in agricultural pursuits.

The outline of organization of the work of the college, as given elsewhere, indicates a division of responsibility which the survey commission believes can not fail to prove a source of weakness. Power and efficiency would no doubt be promoted by closer organization and a larger grouping of these departments, divisions, schools, and courses under fewer responsible heads. The position of dean of biology, for instance, seems to be superfluous, inasmuch as the duties of this position fall more properly under the jurisdiction either of the dean of agriculture or the director of the experiment station.

TEACHING BY MEMBERS OF THE EXPERIMENT STATION STAFF.

The State suffers a great loss whenever a group of highly trained experts is assembled in connection with an experiment station if the duties of the members of the staff do not require or permit a reasonable amount of instruction of students. It is believed that a reasonable amount of teaching would not injure, but would improve, the scientific staff.

It is therefore recommended that, with a few exceptions for cause, at the discretion of the president, members of the staff of the experiment station be required to devote at least a certain designated minimum amount of time to the work of teaching and directing students. The amount for each investigator should be determined by the president of the institution, in consultation with the director in charge of research work.

This recommendation must not be understood to favor a plan whereby research work will be burdened with much teaching, to which research workers on an experiment station staff should prob-

[1] See footnote 1, p. 53.

ably devote not more than an hour or two daily. Sometimes, when important and engrossing work is under way, all teaching should be temporarily discontinued. The laboratories of the experiment station should be accessible to the teaching staff of the college.[1]

THE AGRICULTURAL AND MANUAL-TRAINING HIGH SCHOOL.

The agricultural and manual-training high school at the agricultural college was organized in 1909 to meet the legitimate demand which then existed for a preparatory school. But this was before the movement for the establishment and maintenance of high schools in city, town, and country was well under way. Because of the progress of this movement the demand for a preparatory school at the college is now less insistent than it was, and it should soon cease to exist. Indeed there is danger that the continuation of this school may retard, to some extent at least, the development of high schools throughout the State. Certainly it would do so if it drew many of its students from the State at large. This, however, it does not do. Of the 138 students enrolled during the year 1914–15 in this preparatory school, 58, or 42 per cent of the whole, were from Cass County, and of the 94 enrolled in the first, second, and third years of this school 42, or nearly 45 per cent, were from this county. It is therefore evident that this preparatory school functions largely as a local high school in a county which is amply able to maintain high schools for all its boys and girls.

As a part of the work of this school, a course for rural teachers is offered. To this there is the same objection as to the low-grade courses for rural teachers at the normal schools. The agricultural college should, as elsewhere pointed out, prepare teachers of agriculture, home economics, and industrial subjects for the high schools and supervisors of these subjects for the elementary schools. But as the standard of requirements for teachers in the schools of the State is raised, there will be no demand for teachers of the low grade of preparation which this preparatory school now turns out.

The survey commission believes that this school should be discontinued as soon as the board of regents finds it practicable to do so.

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[1] "According to the German idea, the university professor is both teacher and scientific investigator, and such emphasis is laid upon the latter function that one ought rather to say that in Germany the scientific investigators are also the instructors of the academic youth. * * * The important thing is not the student's preparation for a practical calling, but his introduction into scientific knowledge and research."—Paulsen's 'German Universities' (Thilly's translation).

"It is considered by all educational authorities that the investigator who is doing a limited amount of teaching does the best work for the advancement of science. Teaching makes it necessary for a man to go over his subject broadly, and the presence of young and earnest minds is always very stimulating to the investigator. The man who spends all his time in particular research too often loses his connection with everything else, with the result that he becomes buried in one subject. The greatest investigators have always been great teachers."—President CHARLES W. DABNEY.

The discontinuance should be gradual, as recommended in the summary of recommendations.

It is worthy of note that the agricultural college offers 27 courses in architecture and architectural engineering; that there were only 7 classes in these courses during the week of April 10, 1916, and that 4 of these classes had two attendants each and 3 had only one attendant each. It is not known how many of these were the same students enrolled in more than one class. Two of the classes were in free-hand drawing, 2 in design, 1 in water color, 1 in the history of architecture, and 1 in the history of sculpture and painting. Evidently there is little demand for architecture and architectural engineering by the regular students of the college. It is doubtful if the demand is as yet sufficient to justify the expense, and it seems that the few students in these courses might better get the same instruction in the classes in these and similar subjects at the university, where the classes are larger than at the agricultural college, but still comparatively small.

SHORT COURSES.

The large attendance on the short courses at the agricultural college (in 1915–16, 195 for the four 22-weeks courses and 400 for the courses from 10 to 18 weeks in agriculture, engineering, and domestic science) shows a great demand for practical courses of such length and given at such times as make it possible for young men and women to attend without interfering to any large extent with their work on the farm. The experience of Minnesota and some other States shows the possibility, and the commission believes the advisability also, of organizing the 22-weeks courses into a school of agriculture, elementary mechanic arts, and household arts for those who do not expect to attend college or to become teachers. This school should, it is believed, offer courses of three years, and it is also believed it might be well worth while to try the experiment of repeating the winter courses with the necessary variations in a summer session. The shorter courses should be allowed to remain separate, as they are now. They should not, however, be taught as some of them now are in the regular classes of the college, of the agricultural and manual training high school, or of the longer 22-weeks courses. Those who come for these classes can be better served in classes planned for them alone, and the college can, it seems, well afford to provide such classes. If this separation of these classes from the regular departments of the college requires more instructors, then a larger draft might be made during these weeks on the time of experiment station men, and help might be had from extension workers and farm demonstration agents.

DISTRIBUTION OF ATTENDANCE.

That the agricultural college should extend its influence more largely into the western half of the State is shown clearly by the accompanying attendance map (fig. 10). No doubt in the case of both the college and the university the small attendance from this part of the State is due largely to the fact of its comparative newness and its lack of good high schools. The distance from the institutions also has its effect. Nevertheless, the fact remains that this part of the State both contributes its full share to the support of these institutions and is in no less need of its full share of their service than is the eastern half.

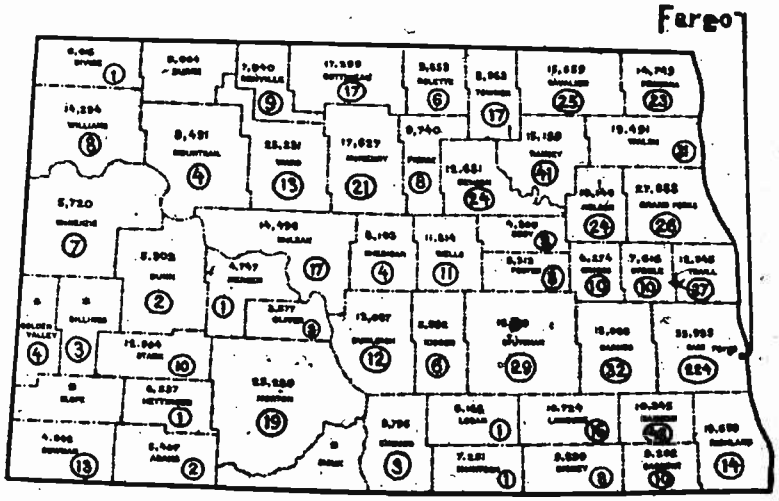

FIG. 10.—Distribution of resident students enrolled in the North Dakota Agricultural College at Fargo, exclusive of summer session, 1914–15. (See Table 31, p. 136.)

The figures above the county name in each case give the population in 1910. At that date the population of Golden Valley County (later subdivided into Golden Valley, Billings, and Slope Counties) was 10,186; and the population of Morton County (later subdivided into Morton and Sioux Counties) was 25,289.

The figures inclosed in the circle in each case indicate the number of students from the county who are enrolled at the agricultural college.

This institution drew 862 students from 49 of the 52 counties of North Dakota (of whom 25.9 per cent came from Cass County) and 174 from without the State; total, 1,036.

In 1910 the population of North Dakota was 577,056. Approximately 60 per cent of the population was found in the eastern half of the State (see note under fig. 8), and 40 per cent in the western half; whereas, of the North Dakota students in residence at the agricultural college, approximately 80 per cent came from the eastern half and only about 20 per cent from the western half.

Only 4 counties, outside of Cass County, sent more than 30 students each to the agricultural college; Minnesota sent 109; and Montana, South Dakota, and Wisconsin together sent 48.

Chapter V.

FUNCTION OF THE UNIVERSITY AND AGRICULTURAL COLLEGE.

AN EFFICIENT STATE SYSTEM OF HIGHER EDUCATION.

HOW THE STATES HAVE ORGANIZED HIGHER EDUCATION.

The States have met in different ways the problem of maintaining higher education. Of the New England States, only Maine has established a State university. Vermont might be included, but Vermont divides its support for higher learning between a university and independent colleges.

New York maintains no State university in the usual sense of the word, but Cornell, having as one of its departments a college of agriculture and mechanic arts, receives for this college State support. Likewise, certain other New York colleges receive State appropriations for agriculture and other subjects, but Cornell receives all of New York's portion of the Federal land-grant funds.

The University of Pennsylvania is sometimes classed as a State institution, since it receives State aid for some of its departments, but it is not under State control.

In the foregoing States, and also in Rhode Island and New Jersey, there are no State-supported and State-controlled universities.

In the following 20 States the university and the agricultural college are located in the same place and both are under the direction of one president and of one board: Arizona, Arkansas, California, Florida, Georgia, Idaho, Illinois, Kentucky, Louisiana, Maine, Minnesota, Missouri, Nebraska, Nevada, Ohio, Tennessee, Vermont, West Virginia, Wisconsin, Wyoming.

In the following 19 States the agricultural college and the university are located in different places, have separate presidents, and usually separate boards of control: Alabama, Colorado, Indiana, Iowa, Kansas, Michigan, Mississippi, Montana, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Carolina, South Dakota, Texas, Utah, Virginia, Washington.

The following States have their institutions of higher education separated as follows: Missouri maintains, under one board, an agri-

cultural college and university at Columbia, and at Rolla a school of mines which receives part of the Morrill fund; Michigan, Montana, New Mexico, Oklahoma, and Colorado have each three separate institutions, the university, the agricultural college, and the school of mines. Colorado and Montana maintain each four separate State institutions of higher learning, including a college of education. In some States, one or more normal schools, originally much below college rank, have been developed into colleges of education.

Illinois maintains a consolidated university at Urbana, and a medical school, a department of the university, in Chicago. The universities of several other States have medical or law schools at other places than that of the main seat of the university. Nebraska has an agricultural college and university in Lincoln, though they are not on the same campus, and a medical department in Omaha, all under the control of the same board. Similar conditions obtain in Minnesota, but all the university departments are in or near Minneapolis. Ohio has a university and agricultural college at Columbus, and universities at Oxford and Athens.

The foregoing statement indicates in a general way how the States have sought to meet the problem of the organization of higher education.

TWO FUNDAMENTAL CONCLUSIONS.

The development of higher education in so many Commonwealths which have sought each in its own way to solve its educational problems has furnished to students of education a fruitful field for study. From this study educational experts seem to have reached two fundamental conclusions touching higher education:

1. A State should, whenever possible and practicable, consolidate at one place in one university all higher education. This should not include normal schools whose purpose it is to prepare teachers for elementary schools.

2. When such consolidation is not practicable, as in States where two or more seats of higher learning have already been established, and developed at great expense, the work of these institutions should be so correlated as to promote cooperation and to prevent unnecessary and wasteful duplication of work.

The commission calls attention to a few of the reasons upon which these conclusions are based:

1. Higher education, especially graduate or research work, is expensive. To promote such work efficiently, costly laboratories are required and thoroughly trained experts who should command good salaries.

2. The number of students in these graduate courses is necessarily small and the duplication of work in them in two or more State-

supported schools would be wasteful, expensive, and unnecessary, and should not be permitted.

3. Professional schools, especially those of medicine, engineering, and agriculture, if high standards are set and maintained, are also very expensive. Even the largest and richest States would hesitate now to establish more than one such school of the highest grade, if the question were open for consideration.

Hence the commission is driven irresistibly to the conclusion that the maintenance in any State of two or more State-supported universities covering the same fields in graduate departments or of two or more professional schools of agriculture or engineering or medicine performing the same or similar service is expensive and unnecessary.

Hence it is that in States like California and Wisconsin, which have all higher education centered at one place in one university, the question of duplication is easy of solution. In States that maintain two or more seats of higher learning the question of duplication is difficult of solution and sometimes perplexing.

CONFLICT BETWEEN STATE UNIVERSITIES AND AGRICULTURAL COLLEGES.

In most States where the university is at one place and the agricultural college at another there is or has been more or less friction between the two institutions. This friction is intensified in States where two strong aggressive institutions have been developed, each striving to enlarge its field of operation. In some of these States the agricultural college has rapidly expanded into a technical university, while the university, striving to become a modern institution, to train men and women for practical pursuits and not alone for the older professions of law, medicine, and teaching, has also tended to become a technical university. Under such conditions conflict seems to be inevitable.

It is easy for the layman to see that the problem in these States is to eliminate, if possible, unnecessary duplication of work, with its accompanying inefficiency and waste of effort and money. Before this may be done a clear understanding of what duplication is and is not, when duplication is justifiable and when it is not justifiable, is essential to any satisfactory solution of the problem.

WHAT DUPLICATION IS NOT.

Because elementary and high schools are local, and because normal schools as recommended by the commission are mainly sectional or regional schools, the inclusion of the same subjects in a number of schools of the same kind is not duplication in the sense used in this report, but only repetition of facilities to meet the requirements of different communities or sections.

WHAT IS JUSTIFIABLE DUPLICATION?

During the first two years of college work there are certain fundamental branches that are common to several of the professional schools or colleges. The offering of these fundamental courses at more than one institution does not necessarily constitute unjustifiable or unduly expensive duplication. For example, such subjects as English, modern languages, mathematics, chemistry, physics, may usually be taught at two or more colleges at but little greater cost than at one, provided the equipment and teaching staff are utilized to anything like their capacity and class sections are not too small. It costs but very little more to offer five sections in mathematics at one institution, and five sections in the same course at another, than to offer ten sections at the same institution. The library and laboratory equipment for such students in the introductory stages of these courses, is relatively inexpensive as compared with the equipment required for more advanced students, and especially for graduate students and professional students of medicine, law, and engineering. These considerations account for the recent pronounced tendency in the direction of the development of the junior college[1] in many States and municipalities.

UNJUSTIFIABLE DUPLICATION.

There is unjustifiable duplication of work when two or more institutions or departments are doing work which might be done, both more efficiently and more economically, and to the full extent required by the needs of the State, by one institution or department.

MAJOR AND SERVICE LINES OF WORK.

In dealing with the problem of duplication, the commission has been guided by what may be described as the principle of major and service lines of work.[2] In accordance with this principle each State institution should have assigned to it certain major fields which it should develop as fully as may be practicable. Literature, history, and philosophy at the university are such major lines; at the agricultural college, agriculture and home economics.

Service lines are such subordinate subjects as are essential to the proper cultivation of a major line. The amount required in these lines varies, but is generally not very full or comprehensive, being usually directed toward a special purpose. The modern languages are service lines at the agricultural college; home economics at the

[1] An institution doing two years' work beyond the high school, or freshman and sophomore years of the college.

[2] For a fuller discussion, see "State Higher Educational Institutions of Iowa," Bulletin, 1916, No. 19.

university. 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 university, a service line at the agricultural college. There should be no material overlapping of major lines.

Certain subjects do not fall readily into line on such a principle of division. The detailed adjustments of these cases of overlapping, once the main principle has been accepted, seem 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 the State commissioner of education and a committee of members of the State board of regents. 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 the larger number of subjects, and forthwith determine whether in a particular institution they shall be developed beyond their elementary stages.

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]

THE PROBLEM IN NORTH DAKOTA.

In the light of the foregoing generally accepted conclusions and of the considerations set forth concerning major and service lines of work, the solution of the problem of duplication in North Dakota with its accompanying friction and waste of effort and money becomes, it is believed, easier of solution.

[1] Certain departments, like chemistry and botany, by their intimate and organic relation with the research work of the experimental stations, will need to develop specialised 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 agricultural college staff instead of continuing his work on the old location.

MAIN PURPOSE OF THE UNIVERSITY AND THE COLLEGE.

GENERAL STATEMENT.

The main purpose of the university should be to give liberal training in literature, science, and the arts; to develop professional education in accordance with the needs of the State, and especially in the older professions of law, medicine, education, and engineering; to promote educational and scientific research; to conduct extension courses which do not duplicate the extension work of the agricultural college.

The main function of the agricultural college and experiment station should be to teach and to develop for the benefit of the people of the State the science of agriculture; to promote, as the needs of the State demand, agricultural, industrial, and technical education, as distinguished from the older professional education, for instance, of law and medicine; to conduct at the experiment station original investigations in agriculture and the allied arts and sciences; to carry to the people of the State through extension courses the results of research and experimental work beneficial to the farmers of the State.

DUPLICATION IN GRADUATE WORK.

It should not be difficult to determine the graduate work that should be undertaken at each of these institutions. The graduate department of the agricultural college, in so far as the college undertakes research, is the experiment station. All graduate work properly belonging to the Government experiment station in North Dakota should be conducted at Fargo or at the substations of the college. Should there be at the university professors interested in special problems connected with agriculture or allied subjects, they might be given an opportunity to conduct experiments at the laboratories of the experiment station, at the farms of the college, or at the substations. For the same reason, professors of the agricultural college who wish to undertake experiments that may be best conducted at the laboratories or stations of the university should be afforded opportunity to do so. In general, graduate work should be divided between the two institutions on the basis of major lines of work assigned to each, as recommended elsewhere. Graduate work at the university will naturally follow some of the lines of work pursued in the college of liberal arts and sciences. There is thus open to the university for research work vast fields that scarcely touch the domain of the agricultural college.

DUPLICATION IN THE COLLEGE OF LIBERAL ARTS.

In a number of agricultural colleges in other States courses in liberal arts and sciences leading to degrees are offered. Advanced courses in liberal arts and sciences, such courses as are given in the junior and senior years, and especially graduate courses, are necessarily expensive. Such courses should be offered only at the university. North Dakota should at this time maintain only one State college of liberal arts and sciences, and this should be at the university. Although it is declared in the charter establishing the agricultural college that the course of instruction shall embrace the English language and literature, moral philosophy, and history, and in the Morrill Act it is stated that the land-grant colleges are "to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life," it clearly was not the intention either of Congress or of the Legislature of North Dakota to make training in the liberal arts and sciences the specific work of the agricultural college. While there is nothing in either Federal or State laws to prohibit its giving even extensive courses in liberal arts and science, it will promote efficiency and economy in both institutions if all advanced instruction in the liberal arts and the pure sciences is offered only at the university.

It will doubtless be practicable for the faculties of the two institutions so to coordinate their work that it may be possible for students who have taken such "liberal" courses as are offered at the agricultural college to enter the junior year of the college of arts and sciences at the university and to win in two years appropriate liberal arts degrees.

Here again cooperation is urged in the framing of courses and the exchange of students between the two higher institutions which by unity of effort may do the work undertaken in Minnesota, Illinois, and California by one consolidated university.

DUPLICATION IN THE INDUSTRIAL ARTS AND THE FINE ARTS.

In States where the agricultural college and the university are separated, the major work in the industrial arts would seem to belong to the agricultural college, the major work in the fine arts to the university. But in North Dakota conditions indicate a modification of such division.

In North Dakota are found extensive deposits of clays for brick, tile, and pottery; and the soil in the western part of the State is underlaid with lignite. The School of Mines and its stations, as authorized by law, are dealing with the problem of making use of these deposits. Its service to the State does not require that it

should prepare engineers to deal with the problems of mining gold, silver, copper, iron, or other metals.

In consideration of these facts, the major work in industrial arts growing out of the manufacture of clay deposits and lignite belongs properly to the university; while the industrial arts related to agriculture, such for example as milling, canning vegetables, the manufacturing of cereals and starch, beet sugar, twine, paper, linen, dairying, and the preserving of dressed meats, may be taught best at the agricultural college.

In proportion as the manufacturing of clay products and lignite develop in the State, the college of education at the university will doubtless find it desirable, in cooperation with the School of Mines, to give instruction in industrial arts growing out of these industries; while the agricultural college will have a large field in training teachers of the industrial arts related to, or growing out of, agriculture.

In 1910 there were in North Dakota only 752 industrial establishments. These had a capital of $1,585,000. Only 4,148 persons were engaged in manufacturing. At that time only 960 persons were reported as engaged in mining. Consequently, it is not possible for the commission to predict what course of development manufacturing may take, or to what extent the State should make preparation for instruction in the industrial arts.

The university should in time develop a strong school of fine arts. American colleges and universities, interested in problems of pioneer life, have until now given comparatively little attention to the fine arts, but with the increase of wealth and the passing of pioneer conditions they will eventually turn their attention to these arts, which are no less essential to the largest and best interests of a democracy than are those things to which we have had to give first attention.

DUPLICATION IN MUSIC, HOME ECONOMICS, AND AGRICULTURE.

Both music and home economics should be taught in all State institutions of North Dakota. Home economics is a subject of universal interest to women, while music is, or should be, a subject of interest to all the people of the State; consequently some instruction in these subjects may well be offered at all the State institutions. The normal schools should continue to give in music, home economics, agriculture, and industrial arts, instruction suited to students preparing to be elementary teachers. Advanced or major courses, however, for experts in home economics, agriculture, and industrial arts related to, or growing out of, agriculture, should be given only at the agricultural college. The agricultural college should be thor-

oughly equipped both for the practical and scientific study of all these branches. It should be able, therefore, to train experts who should become teachers in high schools and normal schools, or engage in business related to its major lines of work.

Instruction in music, including special training in chorus, orchestra, and band, should be given both at the university and at the agricultural college, but advanced and professional instruction in the higher forms of music should be given only at one place in the State, and that place should be the university.

DUPLICATION IN PHARMACY.

There is ground for the opinion that a school of pharmacy might best be developed in connection with the work of the medical college of the university. But inasmuch as it is necessary for the agricultural college to employ a number of expert pharmacists in connection with the food and drug inspection and other regulatory work of the State, the college is able to use these same experts without much additional expense as teachers in the school of pharmacy. Hence, the conclusion is reached that the school of pharmacy should remain at the agricultural college. Inasmuch, however, as it is necessary for physicians to have instruction in pharmacy, the medical school at the university will be forced to offer such instruction as may be necessary for prospective physicians.

DUPLICATION IN EXTENSION WORK.

The presidents of the State institutions, together with the State superintendent of public instruction and the director of the State library commission, should cooperate in formulating a plan for the efficient and economical organization of the extension work to be undertaken in the State. After due deliberation the committee thus constituted should submit to the State board of regents an outline for the accomplishment of the ends sought.

In general the extension work of the several institutions should be differentiated as follows: The university should limit its extension activities to those lines of popular interest that grow directly out of the university curriculum; the agricultural college should confine its activities to the great field of agriculture and rural life; the normal schools should confine their extension activities to work with teachers and should seek, through the more efficient organization of rural and elementary schools, to quicken popular interest in public education and social betterment; both the university and the agricultural college should foster the development of high schools and secondary education throughout the State; the schools at Wahpeton and Bottineau should limit their extension activities to the

special fields suggested by their organization; the State library commission should follow the lines indicated in the chapter covering the work of the commission.

It is to be noted that a very large part of extension work in North Dakota belongs properly to the agricultural college. All extension work coming under the provisions of the Smith-Lever Act of 1914 must be under the direction of the authorities of the agricultural college. North Dakota is at this time receiving from Congress $10,000 annually for extension work under the provisions of this act. In 1922, when the appropriation has reached its maximum, North Dakota will receive, upon the basis of her present rural population, $52,607. To receive this sum the State will have to provide its estimate, $42,607. Hence, North Dakota will have at that time $95,214, probably more, for extension work. This work at present includes (1) county agricultural agents, (2) boys' and girls' clubs, (3) movable schools, and (4) the supporting work of the college and department specialists. Since it has large funds for the purpose, the agricultural college will be expected to carry on this work.

The extension and correspondence work undertaken by the university should include, so far as may be practicable, all subjects not undertaken by the other institutions of the State. Lectures on general literature, on the liberal arts and sciences, on ethics and philosophy, history and government, on sanitation and hygiene, and providing public lyceum courses not closely related to the curricula of the agricultural college—this and much similar work may be carried on best by the university.

Correspondence and extension work are assuming large proportions in modern State universities and agricultural colleges. The aim of these schools seems to be, and rightly so, to extend their work to the utmost bounds of the State and to reach, directly or indirectly, all the people. Some States are spending large sums for extension and correspondence courses. The demand for such work in North Dakota will grow rapidly, if the State can afford to furnish the funds that are needed for its support.

DUPLICATION IN STATE SURVEYS.

The General Assembly has authorized a survey to be known as the Agricultural College Survey of North Dakota, and has also authorized the university to conduct a geological survey.

These two surveys would seem to cover in part the same work. There should at least be no conflict, and it is stated that there has been none. Cooperation on the part of the staffs of these surveys should be encouraged. There should be between the surveys, so far as may be practicable, an exchange of specimens collected for the use

of museums at each institution, and there should be at least an annual conference of survey workers in order to secure cooperation and to prevent duplication of work and waste of effort.[1]

DUPLICATION IN ENGINEERING.

Both the university and the agricultural college are developing schools of engineering. The university has invested in buildings and equipment for engineering $129,313.95; the agricultural college, $135,200. Nothing either in State or Federal laws prevents either institution from establishing and developing such schools.

The enabling acts set aside 40,000 acres of land for the endowment of a school of mines which was located by the constitution at Grand Forks, the seat of the university. It would seem, therefore, mandatory that the State maintain a school of mines and engineering at the university.

On the other hand, North Dakota Agricultural College, like most of the separate land-grant colleges, has undertaken to maintain a department of "mechanic arts" and has interpreted "mechanic arts" to mean engineering of all kinds and all degrees of development.

Thus North Dakota has two colleges of engineering preparing to cover all subjects for which there is a demand, although there is no manifest need for more than one such school. Indeed, the question has been seriously raised whether North Dakota is at present justified in maintaining so expensive an institution as a college of engineering of first rank. The demand for professional engineers in a State so overwhelmingly agricultural is necessarily quite limited. At the same time, there is an impressive accumulation of facts pointing to the conclusion that there is need for the material extension of agricultural education in the State.

ENGINEERING AND AGRICULTURE.

There are educators of distinction who claim that, whenever professional engineering is strongly developed at the agricultural college, it invariably overshadows the agricultural work. The engineering

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1. "The geological survey (of the university) shall be carried on with a view to a complete account of the mineral kingdom, as represented in the State, including the number, order, dip, and magnitude of the several geological strata, their richness in ores, coals, clays, peats, salines and mineral waters, marls, cements, building stones, and other useful materials, the value of said substances for economical purposes, and their accessibility; also an accurate chemical analysis of the various rocks, soils, ores, clays, peats, marls, and other mineral substances of which a complete and exact record shall be made." Session Laws.

"It shall be the duty of the State director of this survey (the agricultural college) to collect, or cause to be collected, samples of all rocks, soils, coals, clays, minerals, fossils, plants, woods, skins and skeletons of native animals, and such other products of economic or scientific interest discovered during this survey, which, properly secured and labeled, shall be placed on exhibition in the museum of the North Dakota Agricultural College." Session Laws.

school, they claim, actually draws students from the agricultural courses. It is true that in many colleges of agriculture and mechanic arts there are far more students in engineering than in agriculture. If this is due to the fact that engineering is better supported than agriculture, the agricultural college would seem sometimes to suffer because of inadequate support when the two colleges are located on the same campus.

There is no reason, however, why an agricultural college should not be actually strengthened by reason of its location on the same campus with the engineering college. The real reason for the transfer of professional engineering unrelated to agriculture to the university is that the State can not afford to support, and does not need, two such schools of professional engineering.

AN AGRICULTURAL COLLEGE OF THE FIRST RANK AN IMPERATIVE NEED.

It will be apparent to thoughtful persons that if an agricultural college having only a limited amount of money devotes it all or the greater part to agriculture and allied arts and sciences, it may develop a stronger and a better school of agriculture than an institution similarly limited in funds which undertakes to maintain also professional schools not closely related to agriculture. For this reason Massachusetts has been able to maintain a good college of agriculture, because it devotes all available money to this one purpose. In Massachusetts the Morrill fund is divided between the agricultural college at Amherst and the Massachusetts Institute of Technology, at Boston, the former receiving two-thirds, the latter one-third, of the fund. But even if the college received all the Morrill fund it would seem better for the State to spend it all in developing a thoroughly efficient school of agriculture rather than two inefficient schools, one of agriculture and one of professional engineering which touches but slightly the problems of rural life.

Although, as elsewhere shown, the Agricultural College of North Dakota, including the experiment stations and regulatory work, already has a relatively large annual income—more than $400,000—this income is not yet large enough for the full support of such a college of agriculture as the State of North Dakota should have.

Since it is not possible, without a constitutional amendment, to center all engineering at either the college or the university, the commission is driven to the conclusion that the engineering work of the two institutions should be so divided as to prevent expensive and unnecessary duplication, the agricultural college to retain and to develop the courses related to agriculture and the industries growing out of agriculture, chemical engineering, and engineering courses designated industrial. (See recommendation 5, ch. 12.)

ENGINEERING AT THE COLLEGE.

The agricultural college should give such engineering as is related to agriculture—for example, surveying, road making, drainage, irrigation, water supply, drafting and designing to aid in the construction of rural buildings, such as farm houses and barns; engineering such as may be used in connection with the management of farm machinery, in the construction of agricultural manufactories, such as dairying, milling, canning, packing, refrigeration. In fact, the agricultural college, in proportion as its means permit and the needs of the State demand, should give instruction in all engineering that may help to lighten the burdens of the farm and the home or to aid in the development of industries connected with the farm and the manufacturing of the products of the farm.

ENGINEERING AT THE UNIVERSITY.

Both efficiency and economy demand that professional engineering such as is now generally given in the great engineering schools, demanding as it does thorough training in the higher mathematics and physics and calling for expensive laboratories, and covering highly technical fields of work difficult to master without long and laborious application, should be centered at one place. These professional courses in mechanical, electrical, structural, and railroad engineering, which are very expensive, might be given at the University of North Dakota, but they should not be given at the agricultural college. All its available resources are needed to make it a great agricultural school. At any rate, North Dakota is not able to develop two such institutions. If the Massachusetts Institute of Technology and Harvard University found it worth while through cooperation to prevent waste and increase efficiency, what excuse can there be for the maintenance of two schools of professional engineering covering the same field, especially in a State having need for relatively few professionally trained engineers?

COOPERATION OF FACULTIES NEEDED.

It does not seem to be a difficult task to so divide the engineering work of these institutions as to prevent duplication in major and expensive lines. It is apart from the prime mission of the agricultural college to train men to build great office buildings for the city, to become marine or railroad engineers, electrical engineers (a profession split already into a score or more specialties), mining engineers—in short, to fit students for any of the highly specialized professions whose fields of operations are far removed from the needs of the farmers, from industries growing out of agriculture or the activities of the villages, towns, and small cities of North Dakota.

Nevertheless, the solution of the engineering problem in North Dakota is confronted by difficulties and calls for the cooperation of the faculties of the two schools. Civil engineering, highway engineering, some sanitary and municipal engineering, and chemical engineering fall naturally into the curricula of agricultural colleges. So closely is the work of the entomologists at the experiment station related to sanitation that the problem of eradicating "mountain fever" has been undertaken through the cooperative work of station entomologists and medical experts. One preparing to become a sanitary engineer might find it profitable to take courses in hygiene and sanitation at the medical college of the university, engineering courses both at the university and college, and courses in entomology and in veterinary science at the agricultural college. German students often spend a semester or more at two or three universities. Why should not North Dakota students find it advantageous in preparing for the professions to take some work both at the university and the college? Indeed, the State board of regents is especially authorized to provide for the exchange of students and instructors between the higher institutions of North Dakota.

Under the division proposed by the commission the college will still hold all the engineering courses related to agriculture and allied subjects. For these it needs not only the engineering buildings and equipment it now has, but in the near future it will need additional engineering equipment and buildings. It will continue to maintain courses in farm architecture, including the building of country homes, barns, cement construction, and possibly school houses; in power machinery, motor engines, dairy engineering, rural sanitation, and hydraulic engineering for farm purposes. These and other similar subjects have scarcely been touched by many of the agricultural colleges of the country.

The plan here outlined leaves undisturbed the following groups of subcollegiate students at the agricultural college: Drafting and building, 6; power machinery, 75; winter short course engineering, 204; engineering summer school students, 75; total 360. Courses of this type should not only be continued, but strengthened. With the approval of the board of regents advanced instruction in these branches might be continued through college courses and proper degrees granted upon their completion. At least one agricultural college is now granting a degree in agricultural engineering. Whether degrees should be given in what, for the lack of a better term, has been called "industrial" engineering, the board of regents and the faculty may be left to determine.

Under the plan here recommended only a very small number of students taking professional engineering courses such as are offered

at the university would be affected—certainly not more than 22, and perhaps a much smaller number.

Indeed, it seems that the agricultural college should be happy to see such professional engineering courses as have little or no connection with agricultural development transferred to the university and the money thus saved devoted to more promising fields of endeavor. As agriculture grows more efficient it will grow more complex. The agricultural college will need large sums for extension work, for county agricultural agents, for cooperative work with consolidated rural schools, county high schools, and agricultural departments of normal schools.[1]

Without doubt it would be a waste of public money to maintain in North Dakota two colleges of professional engineering covering the same fields. Certainly many promising fields, as yet untouched, are open to the agricultural college. If it is urged that North Dakota needs two schools of professional engineering doing a similar service, more compelling reasons could be urged for the establishment of at least 10 colleges of agriculture. For every engineer needed in the State of North Dakota there is urgent need for at least 100 well-trained farmers. North Dakota, however, needs but one college of agriculture, but it can, and should be, made an institution of first rank.

AGRICULTURAL ENGINEERING.

The whole subject of agricultural engineering and rural arts is well covered by Prof. L. H. Bailey, formerly dean of the College of Agriculture of Cornell University in an article in the "Cyclopedia of American Agriculture."[2] The conclusions reached by Prof. Bailey are powerfully supported by facts presented in other parts of this report. These facts have been gathered by first-hand studies undertaken by the commission and may be understood by reference to maps and statistical tables. Again and again the commission is driven to the conclusion that the paramount problem of North Dakota is that of contributing to the health and happiness and prosperity, to the spiritual and intellectual life of the rural people.

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[1] "There will be established," says Prof. Bailey, "out in the open country, plant doctors, plant breeders, soil experts, health experts, pruning and spraying experts, forest experts, farm-machinery experts, drainage and irrigation experts, recreation experts, market experts, and many others. There will be housekeeping experts or supervisors. There will be need for overseers of affiliated organizations and stock companies. These will all be needed for the purpose of giving special advice and direction. We shall be making new applications of rural law, of business methods for agricultural regions, new types of organization. The people will find that it will pay to support such professions or agents as these."

[2] See Appendix IV.

Chapter VI.

DEPARTMENTS OF EDUCATION AT THE UNIVERSITY AND THE AGRICULTURAL COLLEGE.

Elsewhere in this report it is urged that the normal schools of North Dakota shall limit their efforts to the preparation of teachers for the elementary schools of the State, that they shall gradually raise their standards to such degree as will enable them to give such preparation as should be required of teachers, both in urban and in rural elementary schools, that the normal schools now in existence should be given additional support, and that others shall be established to the end that a sufficient number of teachers may be prepared for all the elementary schools of the State. It is the task of the university and the agricultural college to give professional preparation for high-school teachers, teachers of special subjects, supervisors, superintendents and teachers in normal schools and colleges. Some of the graduates of these institutions and more who do a less amount of work than is required for graduation will, of course, become teachers in the elementary schools, but it should not be considered a part of the work of the college or university to prepare elementary teachers. The work of this kind now done at the university should be abandoned as soon as the normal schools are able to prepare all the teachers needed in the elementary schools of the State.

In addition to a knowledge of subjects taught, which should not be less than that represented by graduation from a standard college, teachers of youth in high schools should have a knowledge of economic, industrial, social, and civic life, an understanding of the relation of the subjects they teach to other subjects taught in the schools, and a breadth of culture which can be gained best at college or university. Principals and supervisors who must formulate, inspect, and direct the work of teachers under their charge, and superintendents who determine policies and administer the business affairs of city, county, and State school systems, need no less.

As elsewhere stated, the increase in the number of high schools in the State and the growing desire for better-trained superintendents and supervisors may be expected to make a steady demand for from

150 to 200 recruits from the university and college annually, at least until those entering this field of work remain in it much longer than they now do. At the University of North Dakota 208 students were enrolled in education during the year 1915–16; of these, 29 were in the senior class, 34 in the junior class, 72 in the sophomore class, 66 in the freshman class, and 7 were classed as specials. During the week of April 10–16, 65 of these attended a class in special methods in the elementary schools, and it may be supposed that most of these were preparing to become elementary teachers. At the agricultural college during the same week, 25 were in the senior class in education, 17 in one junior class, 16 in another, and 3 in a class the rank of which is not stated. Assuming that all the 29 seniors in education at the university and all the 25 at the agricultural college begin work as high-school teachers, superintendents, or supervisors in North Dakota at the beginning of the next school year, the total will be only 54, about 25 per cent of the number needed. Some will, of course, come from other States, but it is evident that the number of graduates in education from these two schools should be much larger than it now is, and that the school of education at the university and the department of education at the college should be largely increased. The interests not only of the high schools and the systems of elementary schools of the State, but the interests of the university, the college, and normal schools also depend upon it. The better and more numerous the high schools, the more numerous and better prepared will be the students at the higher institutions.

Certainly the agricultural college might devote a larger amount of its funds to this purpose. The Nelson amendment to the Morrill Act, increasing by $25,000 the annual appropriation of the Federal Government to each of the land-grant colleges, provides that these colleges may use a part of this fund for the maintenance of courses for the preparation of teachers of agriculture and mechanic arts. The Commissioner of Education has interpreted this to include teachers of home economics, and has urged that a liberal portion of this fund be so used.

Both the school of education at the university and the department of education at the college should have for their use as laboratories schools of 12 grades, including both elementary and high schools. Such a school should be provided on the campus at each place, or arrangements should be made whereby the use of one or more schools can be had for this purpose in Grand Forks and in Fargo.

Chapter VII.

THE STATE NORMAL SCHOOLS.

THE SCHOOLS OF NORTH DAKOTA PREDOMINANTLY RURAL.

In 1910 nine-tenths of the children of school age in North Dakota lived in the open country or in villages and towns of less than 2,500 inhabitants, and were classed as rural in the United States census. Three-fourths of them lived outside of any incorporated place. The school problem of the State is therefore overwhelmingly a rural-school problem.

A very large majority of the men and women in the rural communities of the State are engaged directly in farming and in making country and village homes. Practically all the remainder of the rural population are directly interested in these occupations. The experiences of the children are almost all connected with the farm, and most of the children are looking forward to farming as their life work. For them it will be the means of making a living, of rendering service to State and society, and of self-expression. In so far, therefore, as education is vocational in North Dakota, it should, for a large majority of the children, prepare for farming, for home making in country, village, and small town, and for intelligent, joyous living under rural conditions. It would be easy to show that out of their rural life and occupations must come also a very large part of their cultural education, a very important element of which must consist in giving the power of understanding of and sympathy with the best in the life of the communities in which they live and of which they are a part.

In this implied plea for a larger amount of instruction in agriculture and home making for boys and girls in the rural schools of North Dakota it is not forgotten that those who live in the country and till the soil and make the country homes are also citizens and human beings, and that country children have the same right as have city children to such instruction and training as will prepare them for the duties and responsibilities of citizenship, develop most fully all their qualities of manhood and womanhood, and enable them to enjoy the finest and best in all the life of the world with which they may come in contact. Children in the country are not

to be trained into mere working cattle any more than children of the city are to be made into mere productive machines, however intelligent, for the great industrial plants. It is remembered, however, that it is ever more and more important that the great mass of country people should be intelligent about the life they live and the work they do, and that all education to be most effective must come out of and return into the life and work of those to be educated—"from life, through life, to life."

The schools for three-fourths of the children of North Dakota must take hold of the life and work of the farm and the open country. In them must be taught effectively what country people living on and by their farms need to know. But schools are made by their teachers, and teachers can not teach effectively that which they themselves do not know. Therefore the schools in which teachers are prepared must keep definitely in mind the work these teachers are to do and use all possible means to prepare them for it. In North Dakota they should prepare more than three-fourths of their students who are prospective teachers to teach to country children the things that as men and women living on North Dakota farms and in North Dakota villages they will need to know, and also teach them how to organize and manage country schools, not forgetting, of course, the needs of the smaller number who will teach in the schools of towns and cities.

RURAL TEACHERS NEED NO LESS PREPARATION THAN CITY TEACHERS.

It is popularly supposed that teachers in one-room country schools need less education and professional preparation than those who teach in graded schools of the cities. A brief consideration of the facts in the case will, however, show the fallacy of this supposition. In the cities the schools are well organized, with expert superintendents, supervisors, and principals. Paid janitors and expert health inspectors look after the heating, lighting, sanitation of buildings, and the health of the children. Courses of study are carefully made out by subjects, grades, and years. Children are classified by principals, who also assist teachers in their more difficult problems of discipline, as they and the special supervisors direct and assist them in their classroom work. To the individual teacher is assigned a group of children all of one grade, and she is given a definitely prescribed kind and amount of work to do, or she may be required to teach one or more closely allied subjects in two or more grades. If she is weak in one subject or in any one phase of school management, she can be given special help in it or be relieved of it altogether. For the children and the older people of urban communities there are many agencies of education other than the schools, such as public libraries, museums, lecture courses, etc.

In the country it is far otherwise. The schools are not so well organized, and probably never can be. If the superintendents are expert, well educated, and highly trained, which is too often not the case, still they can visit any one school very seldom. In most counties there are few or no assistant superintendents or supervisors of special subjects. From the nature of the case, there can be no supervising principal in the one, two, or three teacher school. Frequently there is no trained janitor or expert health inspector. The teacher must be her own janitor, health inspector, truant officer, principal, supervisor, and to a large extent her own superintendent. She must organize and manage her own school, and teach unaided all the subjects to all the children in all the grades. If she fails in any particular, the failure can not be made good by anyone else. There are fewer educational agencies for children and older people in the country than in the city, and the function of the country school should, therefore, be much larger than that of the city school needs to be. The need for power of leadership in the country teacher is correspondingly greater than the need for such power in the city teacher.

NEED OF EQUAL PREPARATION FOR ALL SCHOOLS.

If there is need for well-educated, well-trained, and experienced teachers in the schools of one community there is equal need for such teachers in all communities. If the State taxes all the property and all the people of the State for the entire or partial support of all the schools of the State to the end that the State may have intelligent, virtuous, self-supporting citizens, then the State must require every community to put into its schools teachers who are prepared to do their work in such way that the money raised through the taxes of the people of the State may not be wasted and the State defrauded in the character of its citizenship.

If the people of all communities contribute to the support of the normal schools and other schools in which the teachers are prepared, then they have a right to demand that teachers be prepared in such way and in such numbers that there may be properly prepared teachers for the schools of each and every community and that no community may find it necessary to fill its schools with incompetent teachers at the risk of the loss of their money and the time and opportunity of their children. The State that assumes the responsibility of educating all its children at public expense must assume the accompanying responsibilities of determining standards of preparation for its teachers and of providing the means and opportunity of preparation for all the teachers needed in all its schools to the extent that they are not prepared elsewhere and by other means. Otherwise, the State is open to the charges of injustice and folly.

NUMBER OF TEACHERS.

In 1913 there were in North Dakota 171,872 children of legal school age. The rate of increase for the period of three years preceding 1913 was 11 per cent. At the same rate there should be approximately 190,700 children in 1916. In 1913 there were enrolled in the public schools of the State 142,434 children, and in approved private schools 2,611, a total of 145,045. Of these, 7,998 were in high-school grades. The total number of schools maintained in that year was 5,298, of which 464 were graded and 4,834 ungraded. Most of these ungraded schools were one-teacher schools. The total number of teachers employed was 7,911, of whom 7,396 were in elementary schools and 515 in high schools. The increase for the two preceding years was: Total, 342; elementary, 287; high schools, 55. At the same rate of increase there would be now (1916) a total of 8,253; elementary, 7,683; high schools, 570. Most of the high-school teachers are in cities and towns, since the development of the high schools in these began earlier and has gone forward much more rapidly than in the country, but a very large majority of the elementary teachers are in the rural schools and a still larger proportion of these are in ungraded one-teacher schools.

Since the rural schools have been distributed more or less evenly over the entire area of the State, and since the average enrollment in these schools is very small (only 16 to a teacher), future increase of rural population will not necessitate an equal increase in the number of rural elementary teachers. With proper care in guarding against an unnecessary increase in schoolhouses, and with due regard to the possibilities and advantages of consolidation, there will be need for very few more rural elementary teachers until after the rural population has become fully twice as large as it now is. But the movement for rural high schools has just begun, and the number of high-school teachers needed may be expected to increase more rapidly than the population. Indeed, it should and no doubt will come about within the next two decades, that there will be high schools within reach of all, and that a large majority of boys and girls of high-school age will attend them. There is now a definite movement in this direction in all parts of the United States, and nowhere stronger than in the West. For many years the increase in the number of elementary teachers in North Dakota has been far less in proportion than the increase in population, while the increase in the number of high-school teachers has been more than that of the population. For the five years 1911–1915, inclusive, the increase in the number of elementary teachers was a little less than 2 per cent, while the increase in number of high-school teachers was nearly 36 per cent. The increase in population from 1910 to 1915 is estimated at 23.6 per cent (United States census).

NUMBER OF NEW TEACHERS NEEDED ANNUALLY.

In response to a questionnaire sent to all elementary and high-school teachers in the State 4,981 replies were received and tabulated. Of those reporting 3,068 were rural teachers, 1,913 teachers in cities and towns. The average age of rural teachers reporting was 23 years, of teachers in cities and towns 28 years. The average time the rural teachers had been teaching was two years, city and town teachers 5.6 years. This indicates that approximately one-half of the rural teachers at the beginning of each school year are new and wholly inexperienced, while only about one-fifth of the teachers in urban communities are new. The summary of replies to the questionnaire reveals other facts of such general interest and such value to this discussion that it is inserted here. (Tables 15–17.)

TABLE 15.—*Birthplaces of teachers.*[1]

North Dakota	1,635	Nebraska	57
Minnesota	1,107	Other States	234
Iowa	412	Canada	87
Wisconsin	575	Norway	43
Indiana	221	Sweden	17
Illinois	154	Germany	20
South Dakota	169	Other countries	41
Michigan	90		
Ohio	78	Total reporting	4,981
Kansas	41		

TABLE 16.—*Occupations of fathers of teachers.*[1]

Farmer	3,078	Teacher	51
Merchant	306	Lawyer	40
Laborer	272	Physician	35
Contractor	177	Lumberman	34
Clergyman	118	Banker	32
Railroad man	118	Other occupations	535
Salesman	79		
Blacksmith	54	Total reporting	4,981
Grain buyer	51		

[1] Based on replies from 4,981 teachers. See also Appendix X.

TABLE 17.—*Rural teachers and city teachers compared.*[1]

Teachers.	Rural teachers.	City teachers.
Number of teachers reporting	3,068	1,913
Average age reported.....years	23	28
Average monthly salary in 1915–16	$56.39	$82.58
Number who were born in country	2,191	979
Number who were born in city	877	934
Amount of schooling:		
Graduated from eighth grade only	121	
Had 1 year of high school only	339	7
Had 2 years of high school	449	16
Had 3 years of high school	403	38
Had 4 years of high school	1,501	220
Normal school	241	1,070
College	14	560
Teachers' certificates:		
Second grade elementary	2,190	22
First grade elementary	621	248
Professional	257	1,640
Sex of teachers:		
Male	462	413
Female	2,606	1,500
Average number of years' experience in teaching	2	5.6
Average number of pupils enrolled	16	34

[1] Teachers employed in schools located in communities having a population of 2,500 or over are classified as "city teachers;" all others are classified as "rural teachers."

With teachers whose average age is 23, more than half being below this age, an average experience of less than 18 months of teaching, nearly half having had less than four years of high-school education, few having had any appreciable amount of professional training, and fewer still any definite preparation for the specific work which the country schools should do, the character and efficiency of the rural schools of the State must be far below the standards which all who are interested in the welfare of the State would like to see maintained; and little improvement may be expected until the conditions affecting teachers are much better than they are now. The points of attack for the improvement of the schools must be found in the raising of standards of requirements for the preparation of teachers and in providing the means for this better preparation.

No doubt most of the rural teachers quit teaching after one or two years of service because of their lack of preparation, their consequent lack of interest in their work, and their failure to attain sufficient success to create an interest in it. Many of them come from other States in which they have received whatever preparation for teaching they may have, but this type of teacher immigration will naturally grow less as the State grows older. Therefore, even with the longer terms of service which will come with the better preparation of teachers, the State must expect to have to furnish from its own schools approximately 1,000 elementary teachers and from 150 to 200 high-school teachers annually for many years to come. There will also be a demand for an increasing number of trained superintendents, principals, supervisors, and teachers of special subjects, such as drawing, music, agriculture, and domestic science.

REASONABLE STANDARDS OF PREPARATION.

As already pointed out, the teachers in rural schools need no less ability, knowledge, and skill than teachers in city schools. For teachers in its elementary schools a rich and progressive State like North Dakota should demand as a minimum preparation graduation from a standard four-year high school and two full years of normal-school work, and it should encourage those preparing to teach in its elementary schools in the country to take still another year of normal-school preparation. It should require of teachers in its high schools graduation from its university or agricultural college, with a reasonable amount of pedagogical training. For superintendents and supervisors of special subjects should be chosen those who by their success as teachers have shown their fitness for such work, and who, after having gained experience as teachers, have fitted themselves by further study in university or college or by independent or prescribed study, as provided in the "Summary of recommendations and conclusions," for the work of administration and expert supervision. Of course full equivalents should be accepted in all cases. (See recommendation 27, ch. 12.)

The State should require of its rural teachers, both in elementary and high schools, such knowledge of rural life and rural industries as will enable them to inspire and direct the life of rural communities and to teach boys and girls the things they will need to know as men and women living and working in the country. It should also require of them the qualities of leadership necessary to enable them to assist in organizing, vitalizing, inspiring, and directing the life of rural communities. Policies of administration should be adopted looking toward longer terms of service and less moving of teachers from one school to another.

TABLE 18.—*Preparation of teachers in North Dakota.*

Amount of preparation.	Rural and city teachers.		Rural teachers.		City teachers.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
College	574	11.5	14	0.4	560	29.2
Normal school	1,311	26.3	241	7.6	1,070	56.4
High school, 4 years	1,721	34.5	1,501	46.8	220	11.5
High school, 3 years	441	8.8	403	13.1	38	1.9
High school, 2 years	465	9.3	449	14.6	16	.8
High school, 1 year	346	6.9	339	11.0	7	.3
Eighth grade	121	2.4	121	3.9	.....	.....
Total	4,983	100.0	3,068	100.0	1,911	100.0

PRESENT STANDARDS.

The investigation referred to and other evidence at hand show that standards of preparation of teachers in North Dakota are at present far below those just set forth; see Table 18 and figure 11. Of the 3,068 rural teachers responding to the questionnaire, 121 have had only

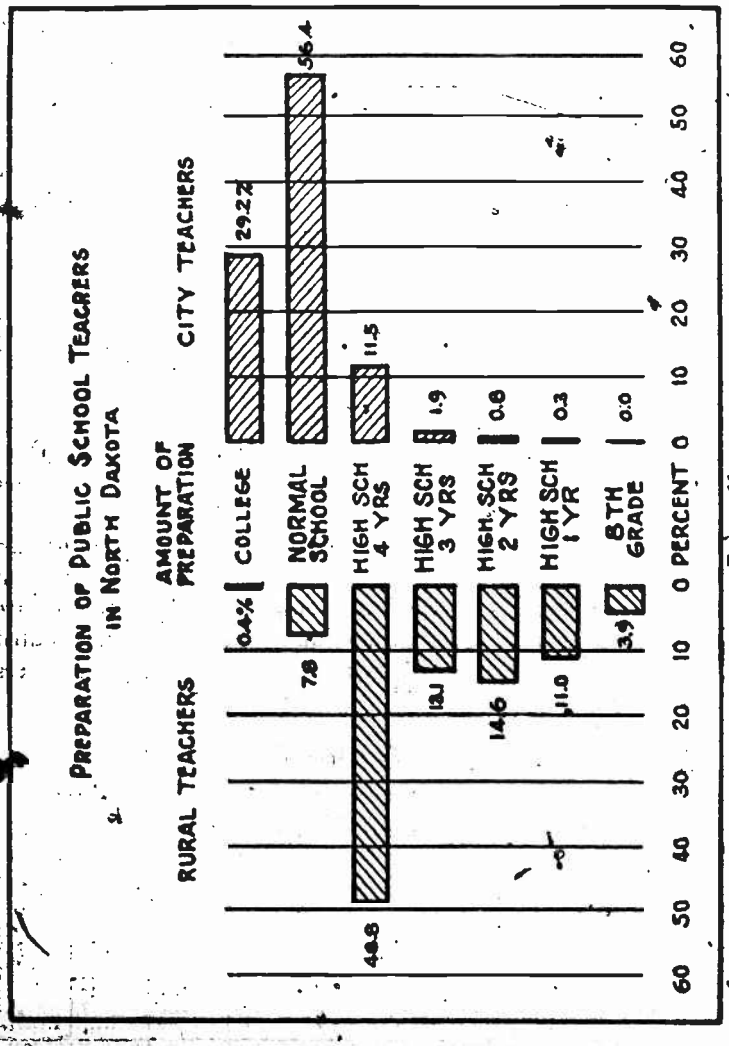

FIGURE 11.

Only 8.2 per cent of rural teachers have had more training than that represented by four years of high school, while 85.6 per cent of city teachers have had normal school or college training.

elementary school education and no professional training, except such as they may have gained by brief attendance on a summer school; 1,191 have had one, two, or three years of high-school education; 1,501 have had four years of high-school education; 241 have had

some professional normal school training; 14 have spent some time in college. Fewer than one-twelfth (8.2 per cent) have had more training than that represented by four years in high school.

Those reported as having one, two, or three years in high school have had little or no professional training. Probably a good proportion of those who have had four years of high school have had some professional instruction in the last year of the high school, since many of them come from States in which "teacher training" is given in the last year of some of the high schools. It is quite certain that most of those reporting normal-school training have had only one year above the high school.

It is therefore safe to say that less than 5 per cent of teachers in the rural schools of the State have had such preparation as would be required by the standards assumed herein as being desirable and reasonable. Another indication of this is found in the fact that of the 3,068 rural teachers reporting, 2,190 held second-grade elementary certificates, 621 held first-grade certificates, and 257 held professional certificates. (See Table 19 and fig. 12.) The standard of requirements for the second-grade elementary certificate is indicated by the fact that it is given to those who, having graduated from the eighth grade of the public schools of North Dakota, take the 10½ months' course in the normal schools of the State. Just what meaning is to be attached to graduation from the eighth grade of elementary schools taught by teachers most of whom have had only the preparation and experience indicated above must be quite indefinite.

That the low grade of preparation of the teachers is not due wholly or chiefly to laxness in examination, but to the want of a sufficient number of persons having the necessary preparation, is shown by the fact that at the four examinations for elementary certificates announced by the board of examiners in 1913, out of a total of 4,067 applicants, 460, or 11 per cent, received first-grade elementary certificates; 1,606, a little less than 40 per cent, received second-grade elementary certificates; and 2,001, or 51 per cent, failed in one or more subjects.

With teachers in city and town schools the case is much better. Of the total of 1,911 reporting, only 61 have had less than four years in high schools, 220 have had four years, 1,070 have had normal-school training, and 560 have had college training. Nearly seven-eighths (85.6 per cent) have had more preparation than that represented by four years in high school. (See Table 18 and fig. 11.) Only 23 hold second-grade elementary certificates, 248 hold first-grade elementary certificates, and 1,640 hold professional certificates. (See Table 19 and fig. 12.)

TABLE 19.—*Certificates held by North Dakota teachers.*

Grade of certificate.	Rural and city teachers.		Rural teachers.		City teachers.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Professional	1,897	38.1	257	8.3	1,640	85.8
First grade	859	17.4	621	20.2	248	12.9
Second grade	2,213	44.4	2,190	71.3	23	1.2
Total	4,979	100.0	3,068	100.0	1,911	100.0

PEOPLE OF NORTH DAKOTA WILLING TO PAY.

That the people of North Dakota believe in public education is shown by the magnitude of expenses for this purpose which they

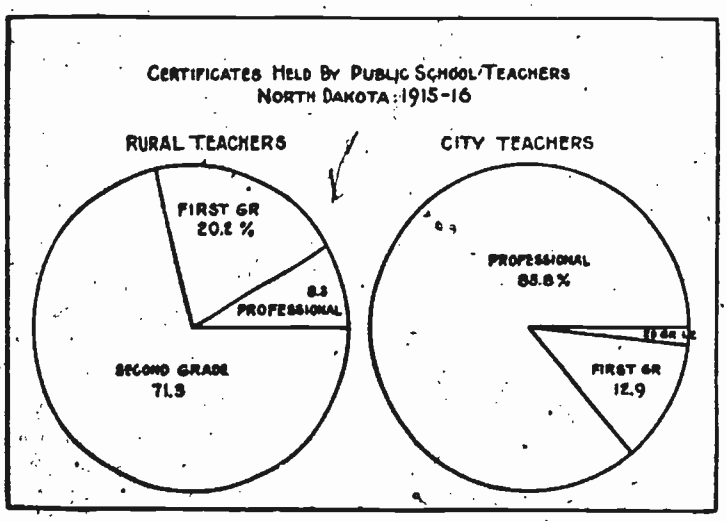

FIGURE 12.

Nearly three-fourths (71.3 per cent) of the rural teachers hold the lowest grade of certificate which will permit them to receive public money for teaching school, while nearly seven-eighths (85.8 per cent) of city teachers hold professional certificates.

have permitted in a State so new. Two years ago the total value of public-school property, as reported by the State superintendent of public instruction, was nearly ten and a half million dollars, equal to about 4 per cent of the assessable property of the State, and the total amount expended for the support of public schools was more than six millions, a larger amount per capita of adult male population than in any other State but one, and the State was ninth among the States in amount spent per capita of children of school age. Since the people willingly make these comparatively large expenditures for schools, it must be assumed that they desire the fullest

possible returns for their money, and that they agree with Supt. Taylor's statement that the time has come when the people have a right to demand that those who offer themselves as public-school teachers shall be thoroughly qualified for their work. Certainly they should not employ those who are not qualified.

TEACHERS' CERTIFICATES IN NORTH DAKOTA.

The legal provisions governing the certification of teachers in the public schools of North Dakota, as set forth in the Compiled Laws of 1913, and amended by chapter 130 of the Laws of 1915, are as follows:

SEC. 1359. *Certificates.*—There shall be four regular grades of certificates issued by the board of examiners. * * *

(1) The second-grade elementary certificate.
(2) The first-grade elementary certificate.
(3) The second-grade professional certificate.
(4) The first-grade professional certificate.

SEC. 1360. *Second-grade elementary certificate.*—The second-grade elementary certificate shall be granted to those persons over 18 years of age who are found proficient in the following subjects: Reading, arithmetic, language and grammar, geography, United States history, physiology and hygiene (including physical culture), civil government, pedagogy, and any one of the following-named subjects: Music, drawing, agriculture, nature study, domestic science, manual training: *Provided*, That the board of examiners may, in their discretion, specify which of the above subjects may be required. The proficiency of the applicants in spelling and writing will be determined from the papers submitted by the applicants. The second-grade elementary certificate shall be valid for two years in any county in the State when recorded by the county superintendent of schools. It shall qualify the holder to teach in any grade in rural and graded schools up to and including the eighth grade, and may be renewable by the county superintendent of schools under rules prescribed by the board of examiners.

SEC. 1361. *First-grade elementary certificate.*—The first-grade elementary certificate shall be granted to those persons over 20 years of age who have had at least eight months' experience in teaching and who, in addition to those subjects required for a second-grade elementary certificate, are found proficient in elements of psychology and four of the following subjects of secondary grade: Elementary algebra, plane geometry, physics, physical geography, botany, the elements of agriculture, nature study, manual training, domestic science, and American literature. The first-grade elementary certificate shall be valid for three years in any county in the State when recorded by the county superintendent of schools. It shall qualify the holder to teach in any grade in any school in the State up to and including the eighth grade and in the ninth grade of schools doing not over one year of high-school work, and may be renewable by the county superintendent of schools under rules prescribed by the board of examiners.

SEC. 1362. *Second-grade professional certificate.*—The second-grade professional certificate shall be granted to those persons who are at least 20 years of age and who have had at least nine months' experience in teaching and have the qualifications necessary for a first-grade elementary certificate, and who

in addition are found proficient in the following subjects of advanced grade: (1) Psychology; (2) the history of education; (3) the principles of education; (4) school administration; (5) methods in elementary subjects; (6) rhetoric and composition; (7) American or English literature; (8) Ancient, English, or American history; (9) some one natural science (which may include agriculture); (10) higher algebra, solid geometry, manual training, or domestic science. The second-grade professional certificate shall legally qualify the holder to teach in any of the common, graded, or high schools of the State, except in the high-school departments of schools doing four years of high-school work. It shall be valid for a period of five years and shall be renewable in the discretion of the board for a period of years or for life.

SEC. 1363. *First-grade professional certificate.*—The first-grade professional certificate shall be granted to those persons who have substantially the equivalent of a college education, and who have had at least 18 months' experience in teaching. They shall have all the qualifications necessary for a second-grade professional certificate and, in addition thereto, be found proficient in the following subjects: (1) Foreign language; (2) a natural science other than the one presented for the second-grade professional certificate; (3) ethics, logic, or sociology; (4) political science, economics, or domestic science; (5) any two subjects of college grade listed for the second-grade professional certificate and not previously offered by the applicant. The first-grade professional certificate shall qualify the holder to teach in all the common, graded, and high schools of the State, and shall be valid for five years or for life.

SEC. 1364. *Special certificates.*—The board may grant special certificates authorizing the holders to teach in any of the common, graded, or high schools, (1) drawing, (2) music, (3) kindergarten, or (4) primary subjects, to teachers holding at least a second-grade elementary certificate. Special certificates to teach (1) agriculture, (2) commercial subjects, (3) domestic science, or (4) manual and industrial training in the common, graded, or high schools of the State may be issued to applicants who possess qualifications equivalent to those required for a second-grade professional certificate. The applicant for a special certificate must satisfy the board by examination or otherwise of his proficiency in the subject which the holder is authorized to teach. Special certificates shall be valid for such a term of years as the board shall prescribe.

SEC. 1365. *Diplomas accredited.*—(1) The diplomas granted on the completion of the four-year curriculum of the teachers' college of the University of North Dakota shall be accredited as a first-grade professional certificate for two years, and after the holder has had nine months' successful experience in teaching, satisfactory evidence of which having been filed with the board, such diploma shall entitle the owner to a first-grade professional certificate for life.

(2) The diploma from the advanced or five-year curriculum of the State normal schools, or its equivalent, the two-year curriculum for high-school graduates, shall be accredited as a second-grade professional certificate for two years, and after the holder has had nine months' experience in teaching, satisfactory evidence of which having been filed with the board, such diploma shall entitle the holder to a second-grade professional certificate valid for life.

(3) The diploma from the four-year curriculum of the State normal schools or its equivalent, the one-year curriculum for high-school graduates, shall be accredited as a professional certificate of the second grade for two years, and after the holder has had nine months' successful experience in teaching, satisfactory evidence of which having been filed with the board, shall entitle the holder to a second-grade professional certificate, valid for five years, which certificate shall be renewable in the discretion of the board.

(4) The certificate of completion issued by the State normal schools to those who complete the 10½ months' curriculum of the State normal schools shall entitle the holder to a second-grade elementary certificate.

SEC. 1366. *Other diplomas accredited.*—Diplomas from institutions within or without the State shall be accredited, and professional certificates issued thereon upon the following basis: (*a*) The bachelor's diploma from a college of recognized standing shall be valid for a period of two years, after its presentation to the board, as a first-grade professional certificate: *Provided*, That the diploma implies at least two-year courses, or 16 semester hours, of professional preparation for teaching, or in lieu of such professional study that the holder of the diploma has had three years' successful experience in teaching or in administering schools after receiving such diploma; and after the holder has had nine months of successful experience in teaching, after the presentation of such diploma, satisfactory evidence of such experience having been filed with the board, he shall be entitled to a first-grade professional certificate which shall be valid for five years and which shall be renewed for life upon satisfactory evidence of successful experience of five years.

(*b*) The diploma or certificate from institutions whose curriculum is the equivalent of the four-year or the five-year curriculum of the State normal schools shall be valid for two years as a second-grade professional certificate: *Provided*, That the diploma or certificate implies at least two-year courses, or 16 semester hours, of professional preparation for teaching or, in lieu of such professional study, that the holder of the diploma has had three years of successful experience in teaching or in administering schools after receiving such diploma; and after the holder of such diploma has had nine months of successful experience in teaching after receiving such diploma, satisfactory evidence of such experience having been filed with the board, he shall be entitled to a second-grade professional certificate valid for five years or for life, respectively.

SEC. 1367. *Permits.*—A college graduate without experience or the required professional preparation may, for reasons satisfactory to the board, be granted a permit or probationary certificate, valid until such time, not to exceed six months, as shall be set by the board for his examination of the professional subjects, when, if successful, he may be granted a certificate, valid for a term of years or for life. Permits to teach till the next regular examination may be granted by the county superintendent of schools to any person applying at any time other than the regular examination who can show satisfactory reasons for not attending the previous examination and satisfactory evidence of qualification, subject to the rules and regulations of the board.

SEC. 1369. *High-school diplomas.*—Diplomas from North Dakota high schools doing four years' work, granted to graduates who have had psychology, school management, methods of instruction, and three senior review subjects, shall be accredited as second-grade elementary certificates; and if within two years from the date of the diploma the holder has had at least eight months' successful experience in teaching he shall be entitled to a first-grade elementary certificate.

SEC. 1372. *Qualifications of teachers.*—No certificate or permit to teach shall be issued to any person under 18 years of age, and no first-grade elementary certificate to any person who is under 20 years of age and who has not taught successfully eight months of school. First and second grade elementary certificates may be renewed without examination under such requirements as shall be imposed by the State board of examiners. The certificates issued by the State board of examiners shall be valid in any county in this State when recorded by the county superintendent of schools.

SEC. 1873. *Teacher must hold certificate to be recorded.*—No person shall be employed or permitted to teach in any of the public schools of the State, except those in cities organized for school purposes under special laws or organized as independent districts under the general school laws, who is not the holder of a lawful certificate of qualification or a permit to teach, and no teacher's certificate issued by the State board of examiners nor a teacher's diploma granted by any institution of learning in this State shall entitle a person to teach in such public school of any county unless such certificate or diploma shall have been recorded in the office of the county superintendent of the county in which the holder is engaged to teach, and it shall be the duty of the county superintendent to record such certificate or diploma.

DISSATISFACTION WITH PRESENT CONDITIONS.

That the people also believe that as a rule teachers in the rural schools are not qualified for the work they should do is indicated by replies received by the survey commission in response to questions sent to several hundreds of persons representing all classes and conditions of life in North Dakota. A majority of those who in these replies expressed opinions concerning rural schools and rural teachers thought that few competent teachers are to be found in the rural schools of North Dakota; that these teachers for the most part are not rural minded; that they have little knowledge of the needs of rural schools or ability to supply these needs; that they have little professional knowledge of teaching and frequently little ability in school organization and discipline; that as a rule they are incapable either of building up good country schools or of rendering much helpful service to country communities. Many of them also expressed the opinion that better schoolhouses should be provided; that homes should be built for the teachers; that efforts should be made to secure better attendance; and, finally, that the normal schools have failed to train adequately or in sufficient numbers teachers for rural schools.

ESTABLISHMENT OF NORMAL SCHOOLS.

North Dakota is one of the richest States in proportion to population in the Union, and may therefore be considered as able to provide fully for the support of such schools as may be necessary for the adequate preparation of all the teachers needed in its schools. That the people of the State understand the importance of this is shown by the fact that in the constitution adopted in 1889 they provided for three normal schools and an industrial school and school for manual training which has since become a normal school. They have recently amended the constitution to admit the establishment of a fifth normal school. Provision has also been made for the professional preparation of teachers in the State university and the State agricultural college. The three normal schools are located by the constitution at Valley City, in the county of Barnes; Mayville, in the

county of Traill; and Minot, in the county of Ward. The industrial school and school for manual training, now the normal and industrial school, is at Ellendale, in the county of Dickey.

To the school at Valley City was apportioned 50,000 acres of public lands; to the school at Mayville, 30,000 acres; and to the school at Ellendale, 40,000 acres. The school at Minot has received no lands from State or Federal Government. For the further support of these schools the State granted a fairly liberal mill tax. In 1913 the millage for these schools was as follows: Valley City, fifteen hundredths of 1 mill; Mayville, twelve hundredths of 1 mill; Minot, thirteen and one-half hundredths of 1 mill; Ellendale, seven hundredths of 1 mill. By the session laws of 1915 a fixed amount of taxes levied upon all the property of the State was substituted for the millage tax for the support of State institutions. Of this fixed amount, the following sums were apportioned to the several normal schools: Valley City, $46,200; Mayville, $36,960; Minot, $41,580; Ellendale, $21,600. The total income of the schools for the year 1914–15, as shown in Table 36, page 143, was: Valley City, $120,192.96; Mayville, $61,779.86; Minot, $54,533.36; Ellendale, $48,197.20. For the average number and grade of students enrolled this is not an illiberal support, as compared with normal schools in other States. Table 20 shows that the values of buildings and equipment are about as large as the average for such schools throughout the country. But the schools must have more equipment and larger annual incomes before they can do fully and well the work which will be demanded of them when the standards of preparation for teachers recommended in this report have been adopted by the State.

TABLE 20.—*Per capita cost of maintenance of State normal schools in certain States, 1913–14.*

[Based on reported number of students enrolled, excluding duplications, and total income; Annual Report of Commissioner of Education, 1914, vol. 2, Ch. 6, pp. 364, 370.]

States.	Schools reporting.	Aggregate number of students.	Total income reported.		
			Amount.	Average per school.	Average per student.
Wisconsin	9	4,456	$1,465,962	$162,884	$329
California	8	3,965	1,056,944	132,030	265
South Dakota	4	1,239	279,976	69,994	226
Massachusetts	10	2,801	608,451	60,845	217
Illinois	6	7,840	1,186,840	197,806	151
Minnesota	5	4,166	559,878	111,975	134
Kansas	3	4,612	488,787	162,787	106
Missouri	6	5,461	599,105	99,184	86
Oklahoma	6	4,938	228,945	57,224	46
Total	57	40,188	6,428,888	112,782	159
North Dakota:					
In 1913–14 [1]	4	2,759	454,090	116,022	168
In 1914–15 [1]	4	2,735	284,703	71,175	104

[1] From reports to the survey commission.

THE NORMAL AND INDUSTRIAL SCHOOL AT ELLENDALE.

Because of the fact that the school at Ellendale began its work as an industrial school and school for manual training, and has accumulated valuable equipment for work of this kind, and because of the peculiar needs of the people of the section which it serves directly, it should probably continue for the present to give instruction in these subjects in its regular and short courses for other than prospective teachers, but it should look to the discontinuance of work of this kind as the high schools of this section are more fully developed. It should, of course, cease at once to function as a local high school for the town of Ellendale. State funds appropriated for the support of schools for the use of the State as a whole should not be diverted to local use. This school, which has the necessary equipment for it, might, it is believed, well give a very few strong courses for teachers of industrial subjects, but it should not be permitted to let either of these phases of its work interfere with its regular work as a normal school for the preparation of teachers for the elementary schools of the State. To perform successfully this double or triple function this school will need a much larger income than it now has. It should immediately make some arrangement for practice teaching for its students. It might possibly arrange for the use of the elementary schools of the town of Ellendale for this purpose, as the school at Mayville has arranged for the use of the schools of that town.

Further discussion of this school is included in the following general discussion of normal schools.

COURSES OF STUDY.

The normal schools of North Dakota are authorized by law to offer the following courses:

1. A 10½-months course, known as the rural course, for graduates from the eighth grade of the public schools. Those who complete this course are entitled to a second-grade elementary certificate.
2. A four-year course for graduates from the eighth grade of the public schools.
3. A five-year course for graduates from the eighth grade of the public schools.
4. A one-year course for graduates from four-year high schools.
5. A two-year course, known as the advanced or standard course, for graduates from four-year high schools.
6. Several special two-year courses for graduates from four-year high schools. These special courses are intended for training teachers and supervisors for such special subjects as drawing, music, domestic

science, manual training, agriculture, and commercial courses. One school has given diplomas in 11 different special subjects.

Equivalents are accepted for admission in lieu of graduation from the eighth grade and from the four-year high schools.

In the beginning only courses 1, 2, and 4 were offered. Other courses were added later. Course 2 offers approximately three years of academic high-school work, supposed to be equivalent to four years of such work in the public high schools of the State and one year of professional work. Course 3 offers approximately four years of academic work, supposed to be equal to four years of high-school work and one year of advanced work and one year of professional work. Course 4 is made up principally of professional work. Course 5 is made up of approximately one year of academic work and one year of professional work. Courses 2 and 4 are supposed to have equal value and lead to graduation with a "first elementary" diploma which is accredited by the State as a professional certificate of the second grade, good for two years and renewable under certain conditions.[1] Courses 3 and 5 have equal value and lead to graduation with an "advanced" diploma, which is also accredited as a second-grade professional certificate, good for two years and renewable for life under certain conditions.[2] The two-year special courses offer one year of professional work and one year in the special subjects taken. Graduates from these courses receive a special diploma and seem to have the same privileges as to certification as do those who take the regular advanced course.

GRADE OF STUDENTS.

In the year 1915–16 more than 60 per cent of the students in the four schools were in classes of high-school grade. Less than 40 per cent, including those in the fourth year of the four-year course for eighth-grade graduates, were doing work in advance of the four-year high-school course. In two of the schools there were a few students below high-school grade. Apparently more than two-thirds of all students enter the normal schools with less than the preparation indicated by graduation from four-year high schools. These students average little more than 16 years of age. Graduates from accredited high schools and those entering with equivalent preparation average about 20 years. Nearly all graduates from the normal courses are students who have completed courses 2 and 4 and have received elementary diplomas.

Only at Valley City has there been any considerable number of graduates from courses 4, 5, and 6, and here the number of graduates from these courses has been only 14 per cent of the total from all

[1] See sec. 1365 (3), p. 86. [2] See sec. 1365 (2), p. 86.

courses. Less than 10 per cent of the total number of graduates from all the schools have taken these courses. The president of the school at Mayville reports no advanced or special pupils and declares that it is useless to offer either of these courses or to make any attempt to give the training needed for rural school teachers as long as the certification laws of the State remain as they are. The president of the school at Minot reports only five or six in these courses.

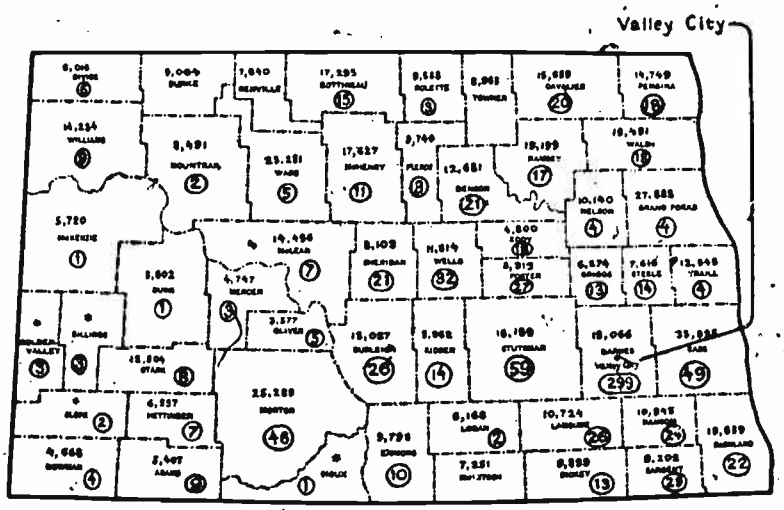

FIGURE 13.—Distribution of resident students enrolled in the State normal school at Valley City, including summer-school students, 1914–15. See Table 31, p. 136.

The figures above the county name in each case give the population in 1910. At that date the population of Golden Valley County (later subdivided into Golden Valley, Billings, and Slope Counties) was 10,186; and the population of Morton County (later subdivided into Morton and Sioux Counties) was 25,289.

The figures inclosed in the circle in each case indicate the number of students from the county who are enrolled at the State normal school at Valley City.

This institution drew 958 students from 48 of the 52 counties in North Dakota (of whom 31.2 per cent came from Barnes County) and 110 from without the State; total, 1,068.

Four counties, outside of Barnes County, sent more than 30 students each to Valley City; Minnesota sent 72.

It is evident that these normal schools are now practically only high schools, with an additional year of study of elementary psychology, history of education, methods of teaching, etc., and some practice teaching under supervision. A study of attendance maps, figures 13–16, and Table 21, shows that they are very largely local high schools for the counties in which they are located and the adjacent counties. Indeed, the school at Ellendale has been providing two years of high-school work for the town at the expense of the State, thereby relieving the town of the expense of providing high-school facilities for its own children beyond the second year.

TABLE 21.—*Local attendance at normal schools.*

Normal schools.	Students from within the State.	Students from county in which school is located.	Percentage of local attendance.
Mayville	357	162	45.4
Valley City [1]	958	299	31.2
Ellendale	288	211	73.2
Minot	183	95	51.9
Total [2]	1,786	767	42.9

[1] Figures include students in summer session and institute.
[2] Figures include students in summer session and institute at Valley City, but not at the other schools.

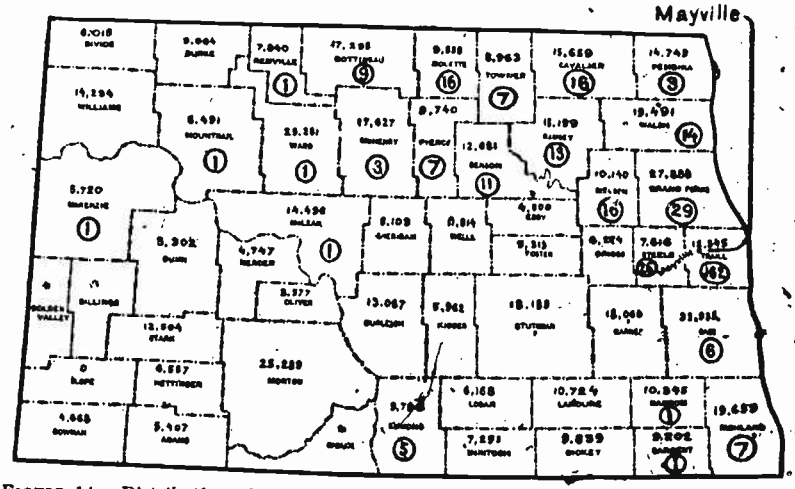

FIGURE 14.—Distribution of resident students enrolled in the State normal school at Mayville, exclusive of summer session, 1914–15. See Table 31, p. 136.

The figures above the county name in each case give the population in 1910.

The figures inclosed in the circle in each case indicate the number of students from the county who are enrolled at the State normal school at Mayville.

This institution drew 357 students from 24 of the 52 counties in North Dakota (of whom 45.3 per cent came from Traill County) and 28 from without the State; total, 385.

Only 9 counties, outside of Traill County, sent more than 7 students each to Mayville; Minnesota sent 14.

GRADUATES OF THE NORMAL SCHOOLS.

The total number of graduates of all kinds from all the schools up to the time of this survey is reported as 2,703, of whom approximately 1,575 are now teaching, and approximately 1,250 of these are teaching in North Dakota.[1] Thus after a quarter of a century from the

[1] These figures are based on the supposition that the percentage of graduates from the school at Mayville and the percentage of those graduates now teaching in North Dakota are approximately the same as for the other three schools.

opening of the first of these State normal schools, the number of graduates of the grade indicated who are teaching in the schools of the State is equal to about one-sixth of the total number of teachers employed in the schools. As shown elsewhere in this report, practically all these graduates are teaching in city and town schools. The number (366) graduated from the four schools in 1914–15 was about one-eighth of the total number of new teachers employed in the State the following year. It is about one-third the number of the elementary teachers that the State will probably have to supply annually from its own schools when the more stable conditions are realized, which will be brought about by the slackening in the tide

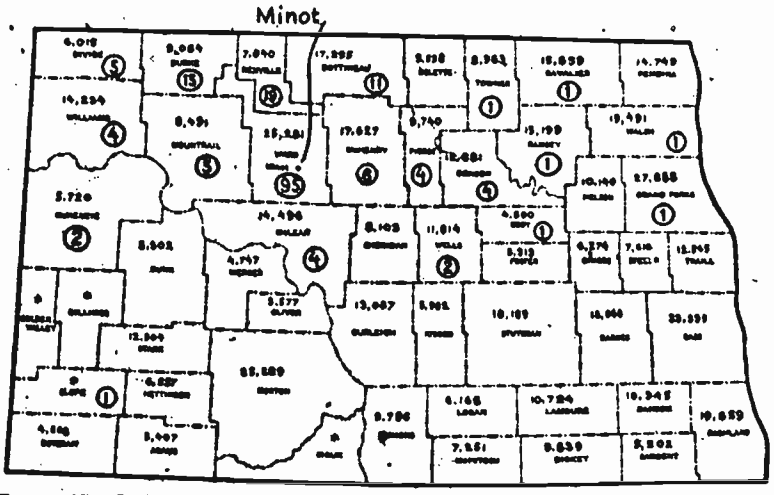

FIGURE 15.—Distribution of resident students enrolled in the State normal school at Minot, exclusive of summer session, 1914–15. See Table 31, p. 136.

The figures above the county name in each case give the population in 1910.
The figures inclosed in the circle in each case indicate the number of students from the county who are enrolled in the State normal school at Minot.
This institution drew 183 students from 20 of the 52 counties in North Dakota (of whom 51.9 per cent came from Ward County) and 19 from without the State; total 202.
Only three counties, outside of Ward County, sent more than 10 students to Minot; Minnesota sent 11.

of teacher immigration, which must surely come in a few years, and the longer average term of service which will result from better preparation of teachers.

Of course, these figures do not represent all the service which the normal schools have rendered and are now rendering to the schools of the State. Every year many young men and women go out, not as graduates, but from the lower classes of the normal schools to become teachers, especially in the rural schools. The general education of these is far below the standards which should be set for teachers in the schools, and of professional training they have had

practically none. Also through their summer schools the normal schools give valuable help to many teachers already in service.

THE TASK OF THE NORMAL SCHOOLS.

This statement of facts is not made for the purpose of condemning the policy or the management of the normal schools in the past, and no adverse criticism of trustees or presidents is implied.[1] These schools have been serving pioneer communities in a new State under frontier conditions and have had to adapt themselves to the condi-

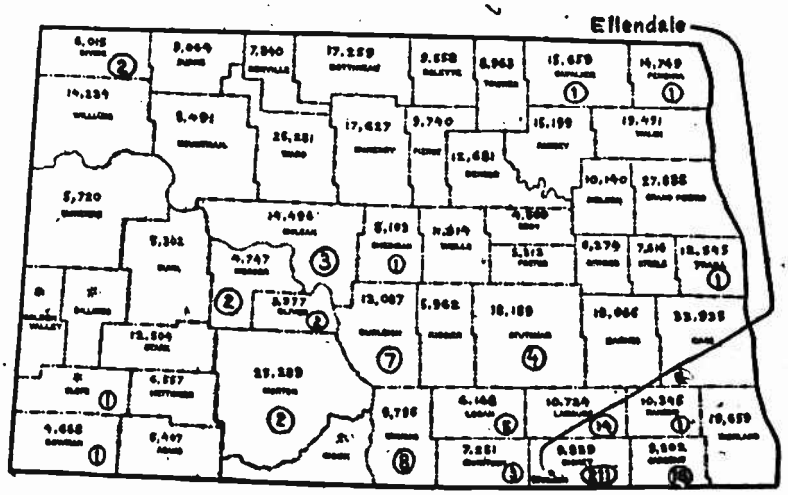

FIGURE 16.—Distribution of resident students enrolled in the State normal and industrial school at Ellendale, exclusive of summer session, 1914-15. See Table 31, p. 186.

The figures above the county name in each case give the population in 1910.

The figures inclosed in the circle in each case indicate the number of students from the county who are enrolled at the State normal and industrial school at Ellendale.

This institution drew 288 students from 20 of the 52 counties in North Dakota (of whom 73.2 per cent came from Dickey County) and 42 from without the State; total, 330.

Only 2 counties, outside of Dickey County, sent more than 8 students to Ellendale; South Dakota sent 23.

tions as they existed. Very naturally also they have followed the example of similar schools in other States. It would have been folly for them to attempt to impose standards of preparation for admission which the schools of the State could not meet or to attempt a type of work which the public sentiment of the State did not approve. The question is now, however, not of the past, but of the present and future.

[1] The commission wishes to express its appreciation of the spirit of service and devotion which it found to exist in all these schools, and of the high character of work they seem to be doing under present adverse conditions. The respects wherein they fail of rendering the service now needed by the State are due to the changing conditions and needs which must accompany the rapid transition through which the State is now passing.

As has already been pointed out, under the most favorable conditions which can reasonably be expected the State must train for its elementary schools 1,000 or more teachers every year. More than four-fifths of these will be needed in the rural schools. The normal schools are the proper agencies for training these teachers, and to this task they should devote themselves wholly and with all their energy and resources, resisting every temptation, however alluring,

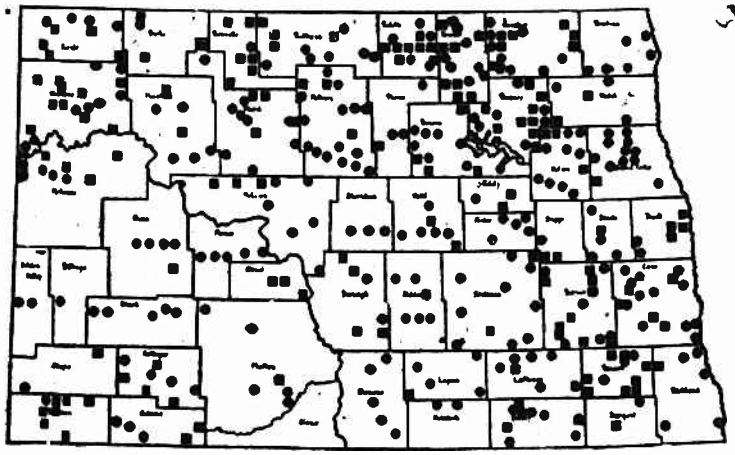

FIGURE 17.—Distribution of consolidated schools in North Dakota.

The number of consolidated schools grew from 114 in 1911 to 401 in 1916. The chief causes of growth, according to the State inspector of consolidated schools, were: (1) State aid; (2) educational campaign.

● Town (250).
■ Open country (151).
Total, 401.

to attempt any other task until this has been accomplished fully and well. Their courses of study should be adapted to this end, and all appropriations made to them should be made with the understanding that they may be used only for this purpose. Of course, some of the graduates may, by their native ability and through study at home and elsewhere, fit themselves for teachers of high-school grades connected with the elementary schools and even for work requiring still greater preparation, but this need not affect the work of the normal schools in any way. The consensus of the best opinion among school officers supports this view.[1]

[1] The survey commission submitted to the chief school officers of the several States of the Union this question: "What in your opinion should be the function of the normal school, the training of teachers for the elementary schools or the training of both elementary and high-school teachers?" A large majority of these chief school officers replied that in their opinion the normal schools should attempt to prepare teachers only for the elementary schools until that task has been accomplished, and that in agricultural States they should make it their chief concern to prepare teachers for the elementary rural schools. The report of the Survey of the Educational Institutions of the State of Washington (Educ. Bull. No. 26, 1916) points out that practically all the normal schools of the older States confine themselves to the task of preparing teachers for their elementary schools.

The standards of admission to the normal schools should be raised gradually, so that after the year 1923 graduation from a standard four-year high school or its equivalent shall be required for admission and two or more years of study shall be required for graduation, as set forth in the conclusions and recommendations included in this report. (See recommendation 22, ch. 12.)

The changing conditions of the State and the multiplication and standardization of high schools[1] now going on will soon make possible the higher standards of education without prejudice to any, and the sentiment of the State will beyond doubt approve the higher requirements for graduation and the changes in the laws for certification which, of course, should accompany pari passu the raising of the standards of the normal schools.

WILL RURAL SCHOOLS PAY?

It may be objected that the country schools will not pay sufficient salaries to entice and hold better-prepared teachers; but in answer it may be stated that the per capita wealth of the rural communities in North Dakota, as in many other Middle Western States, is larger than that of the urban communities, that living is cheaper in the country than in the city, that the purchasing power of salaries in the country is proportionately greater than that of salaries in the city, and that the State now pays its rural teachers much better than it pays its city teachers in proportion to their education, professional training, and experience, and it pays absolutely more per pupil taught.

In rural schools for teachers of an average age of 23 years, with one, two, three, or four years of high-school education, half as many having had only elementary school education as have had normal-school training, with an average of two years of experience and teaching an average of only 16 children, the average salary is $56.39 a month. In urban schools for teachers of an average age of 28 years, 85 per cent of whom have had normal school or college training, with an average of 5.3 years' experience and teaching an average of 34 children, the average salary is $82.58 a month.[2] The average per child for teachers' salaries in the rural schools is $3.40, in urban schools $2.43. As the population in the rural schools grows more

[1] In a letter of Sept. 24, 1916, to the survey commission, N. C. MacDonald, State inspector of consolidated, graded, and rural schools, states that in 1915–16 there were in the State 60 schools with a four-year high-school course, 90 with a three-year high-school course, 120 with a two-year high-school course, and 60 with a one-year high-school course, total 401, an increase of 252 per cent in five years. Of these, 250 were in towns, 151 in the open country. For distribution see map of consolidated schools in North Dakota, Fig. 17.

[2] See Table 17, p. 80.

dense, as school officers learn to consolidate their schools and build homes for teachers, and as teachers better prepared for the work of teaching in the country schools and for inspiring and directing country life can be had, the absolute difference in salaries may be expected to grow much less than it now is. It is not solely because of the larger salaries and the greater attractiveness of city life that teachers seek positions in city rather than country schools. In doing this they are influenced also by the better organization and the greater division of work which make the tasks of the teacher simpler and easier in the city than in the country. It is quite certain that if teachers had the kind and degree of preparation needed to assure success as teachers and leaders in country communities, many of the ablest of them would prefer to work in the country schools.

HOW CAN DEMANDS BE MET?

Assuming that these ideals are to be met, that the State is to have well-prepared teachers in all its schools, urban and rural; that rural teachers are to have preparation in harmony with the work they should do, and that the normal schools of the State are to furnish approximately 1,000 elementary teachers each year, what will be necessary to enable them to meet the demands?

BY RAISING STANDARDS.

By raising the standards for admission to graduation from an accredited four-year high school, or its equivalent, by eliminating their lower classes, and by concentrating their energies on two or three years of work of real normal school grade, the schools now in existence may be able to send out a larger number of graduates each year than they now do. Last year the total enrollment in these schools was 2,725. The enrollment for the three regular terms was: Fall, 1,113; winter, 1,354; spring, 1,154. The number present during the week of April 10–16, 1916, was 1,139—at Valley City, 539; at Mayville, 284; at Minot, 206; at Ellendale, 190—which is probably about the average weekly attendance for the year. Under the present plan of organization these students were spread over practically six years in some of the schools and seven years in others, counting the 10½ months rural course as different from the first year of the four-year and five-year courses. As a result, there was much duplication and much waste of time of teachers because of very small classes.

BY ELIMINATING SPECIAL COURSES.

The situation may be helped also by eliminating to a very large extent the special courses, in which few students are enrolled, and which add considerably to the number of very small classes. After

all there is not much need of specialization in the preparation of teachers for elementary schools in a State so uniform in character as is North Dakota. The work of all elementary teachers is very much alike, except as it varies from city to country. It might easily be shown that much of the demand for specialization is based on false theory. Superintendents and supervisors should, as has already been pointed out, be chosen from those who have had experience as teachers and who have afterwards done advanced and special work in college or university or elsewhere. The few teachers of special subjects needed in the elementary schools might easily all be prepared in one normal school, or each school might add to its regular courses one such special subject. It would be much cheaper for all those wishing to specialize in any particular subject to go to the school in which that subject might be offered than to attempt to duplicate such courses.

That the demand for these courses is not great is shown by the fact that at Valley City, where they have been developed most fully, the number of students taking any one of them is very small.

TABLE 22.—*Graduates in special courses, Valley City, 1910–1915.*

Courses.	1910	1911	1912	1913	1914	1915	Total.
Music and art	4	4	.....	5	4	4	21
Public school music	1	1	.....	.....	3	2	7
Public school art	1	.....	.....	.....	.....	1	2
Domestic science	1	7	11	10	32	17	78
Manual training	1	1	4	8	3	1	18
Physical education	.....	1	1	.....	1	1	4
Kindergarten	.....	.....	1	3	5	7	16
Agriculture	.....	.....	.....	.....	2	.....	2
Commercial	.....	.....	.....	.....	1	.....	1
Primary	.....	.....	.....	.....	.....	3	3
Total	8	14	17	26	51	36	152
Elementary course	128	133	129	97	118	152	757
Standard two-year course	5	4	12	19	13	18	71
Total, all courses	141	151	138	142	182	206	980

Table 22 shows that in 10 special courses there have been only 152 graduates since these diplomas were first given in 1910. The number of graduates from the elementary course, and the "standard" two years' course (for high-school graduates) for the same years, 1910–1915, are given for comparison. From these figures it appears that the number of graduates of the nine special courses, 152, is only 15.5 per cent of the total number of graduates for the period in question, 980, and only 9.4 per cent of the total number of graduates of the institution from the beginning, 1,603. It will be noted that the number of graduates from the nine special courses for the six years is just equal to the number of graduates from the elementary course in 1915, namely, 152. The number of graduates for

the "standard" two years' course, 71, is only 7.2 per cent of the total number of graduates for the six years, 980.

In Ellendale the numbers of graduates in the special courses from 1901 to 1915 have been as indicated in Table 23:

TABLE 23.—*Graduates, by courses and years, Ellendale.*

Courses.	Total.	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915
Mechanic arts	59	....	2	2	3	3	2	1	4	2	4	5	11	7	8	5
Home economics	63	3	3	....	2	4	2	....	4	3	5	3	11	9	8	6
Academic	100	....	7	3	8	6	5	1	8	6	12	12	8	4	7	13
Commercial	15	....	....	....	3	1	2	....	1	....	....	2	2	3	....	1
Fine arts	2	....	....	1	....	....	1	....	....	....	....	....	....	....	....	....
Total	239	3	12	6	16	14	12	2	17	11	21	22	32	23	23	25
Normal course	106	....	....	....	....	....	....	....	5	5	11	13	15	10	20	27
Total, all courses [1]	345	3	12	6	16	14	12	2	22	16	32	35	47	33	43	52

[1] Counted more than once, 44

It is also worthy of note that a majority of those who have been prepared at Ellendale to teach manual training courses have gone to other States. Few have found positions in North Dakota schools. Possibly there should be a greater demand for manual training teachers in the schools of North Dakota, but it must not be forgotten that the first duty of the normal schools is to their own State. Of the total number of graduates of this school (88) who are now teaching, more than half (45) are teaching in other States than North Dakota.

Certain other subjects, as Latin and German and ancient history, taken by very few students might also be eliminated, unless the new conditions should produce a greater demand for them. The school at Mayville did drop Latin and German from its curriculum in 1913. It may be well for some normal school students in North Dakota to study these subjects while preparing to teach in the elementary schools, but it is far more important that all should have full opportunity for the best instruction in those subjects that have to do directly with their future work. The work done in these subjects is of high-school grade and may well be relegated to the high schools as they develop.

BY ELIMINATING SMALL CLASSES.

Reports of class attendance at Valley City for the week of April 10–16, 1916, Table 40, show a class in singing with only 4 students, a class in commercial law with 3 students, a class in mathematics with 1 student, one class in Latin with 3 students and another with 2, a class in German with 4 students, a class of 3 in manual-training methods, two classes of 3 each in mechanical drawing, a class of 1 in copper work, a class of 2 in physical education methods, a class of 4

in hygiene and sanitation (a subject which should be required of all who are preparing to teach). From Ellendale are reported three Latin classes, I, II, and III, of 1, 6, and 2 students, respectively, a class of 4 in "preparatory history." From Valley City 21 classes are reported as having 5 students or less, from Mayville one class, from Minot two, from Ellendale eight, though the average attendance in all classes of these schools was 18.8, 21.4, 24.4, and 12.7, respectively.

The 29 classes of 5 students or less at Valley City and Ellendale held during the week 124 meetings, with an aggregate attendance of 476 students, an average of only 3.8 students. In the higher classes of college, or in graduate work in university, conditions of this kind may not be objectionable, but certainly they should be avoided, if possible, in the normal schools of a State in which these schools are turning out less than one-eighth as many graduates each year as are needed to fill vacancies in the schools, and in which less than 10 per cent of the teachers in the rural schools have had more than a high-school education, and less than 8 per cent have had any professional normal-school training. The more important things should come first.

On the other hand, there are many classes in all these schools and especially in the schools at Valley City and Minot much larger than they should be. During the week referred to there were at Valley City 47 meetings of classes with from 40 to 49 students; at Minot, 25; at Mayville, 6; at Ellendale, 5. Of meetings of classes of 50 or more there were at Valley City 11; at Minot, 11; at Mayville, none; at Ellendale, none. The 94 class meetings of 40 or more students held at Valley City and Minot, during the week of April 10–16, had an aggregate attendance of 4,817, an average of 51.2, or 13.5 times as many as the average at meetings of classes of 5 or less at Valley City and Ellendale.

BY NARROWING VERTICAL AND HORIZONTAL SPREAD, ENLARGING SCHOOLS, AND INCREASING NUMBERS.

By narrowing both the vertical and the horizontal spread of their work, the four normal schools now in the State, which in April, 1916, had an attendance of 1,159, might well care for an average attendance of 1,600 students and graduate 650 annually from courses two and three years above the high school. For this they should have somewhat larger appropriations than they now have, but these the State can well afford. The normal school recommended to be established at Dickinson and a sixth school that should be established sooner or later somewhere in the western half of the State to help in meeting the needs of the people of that section, which is increas-

ing rapidly in population, will, if established and maintained on a liberal scale, soon be able to turn out 300 graduates. The remaining teachers who will be needed according to estimates made herein may well come from the educational classes of the university and agricultural college and from the private colleges of the State.

No attempt should be made to increase the attendance at the normal schools much beyond the numbers they would have with the total attendance indicated above. There are fairly well-defined limits to the number of students which can be taught to advantage in a normal school under the conditions which obtain in North Dakota. To quote from the report of the survey of the educational institutions of the State of Washington made by the Bureau of Education:

> There is a very definite limit to the number of students that can be taught to best advantage in the last year of the normal school. During his last year every student should teach under critical supervision at least an hour a day throughout the entire year, under conditions as nearly as possible like those which must be met in the schools of the State. As a rule, the opportunities for such practice teaching can not be multiplied indefinitely. For this and many other reasons the normal school should not be a large school. * * * In the normal schools of western European countries the attendance is limited.[1] When more teachers are needed the State establishes more schools, instead of increasing beyond desirable limits the attendance at the schools already in existence. In this country those States in which a similar policy is pursued appear to be more effectively served by their normal schools.

TABLE 24.—*Enrollment in non-State colleges—Students of collegiate rank.*

	Collegiate.	Graduate.	Professional.	Total.
1912.				
Fargo College	126	4		130
Jamestown College	71			71
Wesley College	31			31
1913.				
Fargo College	131			131
Jamestown College	40			40
Wesley College	12	3		15
1914.				
Fargo College	157			157
Jamestown College	44			44
Wesley College	37			37
1915.				
Fargo College				
Jamestown College	69			69
Wesley College	56			56

BY ADJUSTING WORK FOR RURAL TEACHERS.

Since four-fifths of the teachers prepared in normal schools should find their places in the rural schools, their courses of study should be made to conform to the needs of country teachers. This should not mean the elimination of many subjects now offered or a less

[1] The usual attendance is about 100.

amount of them. It should mean, however, strengthening the courses in agriculture, horticulture, home making, and rural economics, strengthening the courses in physics, chemistry, and biology, and giving to them a more practical application to country life. It should mean such a treatment of all subjects and such a redirection of all work as to make students intelligent about rural life and occupations and to develop in them rural mindedness of the best type. It should also mean stronger courses in school organization and management, to give to students that power of independent action indispensable to success in rural-school work. Special effort should be made also to develop in students the power of community leadership which rural teachers should have.

Fortunately, these changes would better fit the schools also for the work of training teachers for the grades in the city schools. It is fundamental knowledge of this kind which they most need to start with. With it they may soon gain the necessary special knowledge of grade work, much of which may also be gained in the practice departments of the normal schools. It should also be remembered that much of the life of North Dakota cities and towns is rural and agricultural in its character and interests.

NEW SCHOOLS IN WESTERN PART OF STATE.

Need of more normal schools in the western part of the State is shown by the fact that although 40 per cent of the total population of the State in 1910 was in the half west of a line drawn between the counties of Rolette, Pierce, Wells, Kidder, Logan, and McIntosh on the east and Bottineau, McHenry, Sheridan, Burleigh, and Emmons on the west, and although the increase in population in this part of the State has been more rapid in the last five years than in the eastern half, and although, because of the distinctly rural character of this section, the number of teachers needed is larger in proportion to the population, still only 25 per cent of the students enrolled in the normal schools in 1915, including those in the summer session, were from this section of the State. From the 13 counties southwest of the Missouri River, with 11.4 per cent of the population in 1910, and a larger per cent in 1915, come only 7 per cent of the total number of normal-school students.

SHOULD NOT BECOME "COLLEGES."

When the normal schools have, as recommended, extended their courses to two and three years beyond high-school graduation they should not undertake to do any work of a higher grade than that required for their certificate or diploma. The argument frequently advanced that, the faculty already being engaged, a few students may

be taken for advanced work with little or no additional cost is fallacious. Instructors should not attempt more work than they can do well. If they have time and energy not needed for the work they are already doing, this time and energy should be used in teaching more students rather than for a few students who might have better advantages elsewhere.

None of these schools should attempt to become a "teachers' college." There is no need for such an institution in North Dakota apart from the university and the agricultural college, and will probably not be for a half century yet, if ever. Neither should the normal schools attempt to become junior colleges, doing two years of academic work paralleling the academic work of the university or the agricultural college. Their legitimate work is the preparation of teachers for elementary schools, and they should hold to this, making their courses of study and adapting their methods of instruction to this end. If, after having taught a year or more, any of their graduates should wish to enter the university or the agricultural college of North Dakota, or similar institutions elsewhere, their earnestness, their greater maturity, and such studying as they may have done after leaving the normal school will quite certainly gain for them such advanced standing as they should have.

HELP FOR TEACHERS IN SERVICE.

When the recommendations looking to the establishment of higher and more definite standards of the academic and professional training of all public-school teachers in the State have been adopted the State must in justice to all those already in its service as teachers provide opportunity for them to meet the new requirements. This can be done by dividing the State into extension-service districts, one for each normal school, and requiring each normal school to organize for its district an extension service of such character as may be needed to enable teachers in service to meet the new demands and with special reference to the needs of the particular district. The extension service recently established by the State Teachers College of Iowa illustrates what is meant and might well be taken as a model.[1]

[1] The principal features of the Iowa system of normal-school extension, which is one of the best conceived and most successful, are as follows:

It is exclusively aimed to supplement the previous training of teachers. To this end, study centers are organized in as many localities as possible (94 out of 99 counties now have them). Meetings are held on Saturdays, usually at high-school buildings, and under the direction of the county superintendent of schools. About four hours in the morning and afternoon combined are devoted to the weekly sessions. Heads of departments at the State Teachers' College, and specially qualified local teachers, city superintendents, and other persons conduct instruction at these centers. The whole extension enterprise is under a director who is a member of the staff of the State Teachers' College. The subject matter studied comprises the usual subjects of the school curriculum.

For the next decade the summer schools for teachers held at the normal schools and elsewhere should maintain special classes for these teachers.

Graduation from a normal school or any other school, however good, is no guarantee that the graduate will finally succeed as a teacher. Therefore the practice of granting to graduates a life license to teach or a certificate which may be exchanged for a life license automatically after one or two years of service should be abandoned. Before being granted a life license to teach in the schools of the State, the graduate should prove both ability to teach and willingness and ability to carry forward cultural and professional studies without the constant oversight of teachers and other school helps.

ADVANCED WORK FOR GRADUATES.

Therefore, for all students who leave the normal schools with any kind of certificate or diploma which may be accepted as a license to teach in the schools of the State, the board of regents or the State board of education should, with the assistance of the presidents of the normal schools and the heads of the departments of education in the university and the agricultural college, prepare such courses of study, including both professional and cultural (scientific and literary) subjects, as may be completed within a period of three years by devoting to them not less than 10 hours per week for 10 months in each year. Examinations on portions of these courses should be held from time to time, and no person should be granted a permanent license to teach in the public schools of the State until after he has passed the final examination on all courses prescribed. The final examination should be passed not earlier than two nor later than five years after the time of leaving the normal school.

State, county, and city superintendents and supervisors should be required to give special attention to young teachers who are pursuing these prescribed courses of study and who have not yet been granted a permanent license to teach. Before granting a permanent license to any teacher there should also be required a specific statement from some qualified superintendent, supervisor, or inspector, that the teacher has taught satisfactorily not less than 16 months in the schools of the State, and this statement should be accompanied by a detailed record of work done, showing its excellence and its defects, in the last eight months.

A similar policy should, of course, apply to teachers entering the service from other States and from other schools than the State normal schools of this State. The first license granted to any such

teacher should be a temporary license, and a permanent license should be granted in the same way as for the graduates of the State normal schools of this State. This policy should not prevent the adoption of any policy looking to the full accrediting of certificates or licenses issued in other States on the basis of requirements not below the standards of this State.

MINIMUM SALARIES.

To encourage young men and women of the best native ability to prepare themselves for and to enter and remain in the work of teaching in the schools of the State, the State should, when the standards of admission to and graduation from the normal schools have been adopted and when provisions have been made for continued study as recommended, fix by law minimum salaries for teachers holding normal school certificates and for teachers holding normal school diplomas, the difference between the minimum salaries of the two classes being such as may seem to be justified by their different degrees of preparation, and it should provide for a definite increase in minimum salaries of both classes of teachers when they have complied with the requirements for and have been granted permanent licenses. Such a law should be made to apply to teachers from other States and from other schools of this State, and should not be so construed as to discriminate on the one hand against teachers from the State normal schools or on the other hand to discourage good teachers from other States and schools from entering the service of this State.

PRACTICE SCHOOLS.

The practice school is the laboratory and training ground of the normal school, and it is most important that every normal school should have one or more such schools under its control. The practice school should be large enough to afford all students in the last year of their course in the normal school opportunity to teach at least an hour a day in classes of sufficient size to give experience in class management as well as in teaching subjects. This seems to be the case now with all the normal schools of North Dakota except the one at Ellendale, which as yet has no practice school. But the practice schools of all, except for a rural ungraded school used by the normal school at Mayville, are of the city-school type. Each of the normal schools should make some arrangement by which it may have the control of three or four or more rural schools for use as practice schools. If possible, some of these rural schools should be one-teacher schools, while others should be consolidated schools.

RURAL-SCHOOL COURSE.

In the raising of standards of admission to the normal schools the 10½ months' course now maintained for the training of teachers of rural schools, and to which students are admitted from the eighth grade of the public schools, will necessarily be abolished in the year 1918, as it should be. The State superintendent, the presidents and faculties of the normal schools, and educated men and women in the State agree in admitting that this course is unsatisfactory. Conditions in the State which called for its establishment have passed away. Its continuance under the title of "rural-school course" serves chiefly to keep alive the idea that teachers in rural schools need much less preparation than teachers in city schools.

TEACHERS IN NORMAL SCHOOLS.

Attention is called to the importance of scholarship and maturity of experience on the part of those who undertake the education and training of teachers. Not only do they need thorough scientific knowledge, but it is most important that they shall have such experience with elementary schools as will give them practical knowledge of their problems and their methods of work. The number of young and inexperienced instructors in normal schools should be reduced to the lowest possible minimum. Some of the schools of this State have, it appears to the commission, altogether too many instructors of this type. Of 100 instructors of all grades in the four normal schools, only 3 have the doctor's degree, only 17 have the master's degree, and 80 per cent have no degree showing evidence of work beyond that of the undergraduate in college or normal school.

In the practice of employing assistants at low salaries the several schools differ widely. The school at Mayville reports no assistant instructors. To obtain and retain the services of such instructors as the work of the normal school demands will require a higher scale of salaries than that which now obtains. There is at none of these schools a fixed schedule of salaries, but the average of salaries varies from $1,692.08 at Mayville, $1,383.13 at Minot, and $1,360 at Valley City, to $1,081.58 at Ellendale. Under present conditions in North Dakota it is believed that an average salary of $2,000 would not be unreasonable.

SHOULD EXCLUDE GENERAL STUDENTS.

The normal schools were established and are maintained "to prepare teachers in the science of education and the art of teaching for the public schools of the State." They should therefore exclude general students and refrain from establishing commercial courses and other courses not needed for their purpose.

TEACHER TRAINING IN HIGH SCHOOLS.

In some States, because of the failure of the normal schools to send teachers to the rural schools, the policy has been adopted of maintaining teacher-training classes in the high schools for the purpose of preparing teachers for the elementary schools, and North Dakota has adopted this policy to some extent. These classes serve a useful purpose temporarily, but they should be continued only until such time as the normal schools can prepare teachers in sufficient numbers for all schools. Reasons have already been given why rural teachers should have as extensive and thorough preparation as city teachers. Also there can be no justice in taxing all the people for the support of normal schools for the preparation of teachers for city schools only or chiefly, and then levying on country people another tax for the purpose of giving an inferior kind of preparation to the teachers of their schools.[1]

[1] Dr. Coffman dissents from some of the considerations implied in this paragraph.

Chapter VIII.

THE STATE SCHOOL OF FORESTRY AND THE STATE SCHOOL OF SCIENCE.

THE NEED FOR SPECIAL STATE SCHOOLS OF LESS THAN COLLEGE GRADE.

Rural high schools in North Dakota are of very recent development, and neither in these nor in the elementary schools are agriculture, farm mechanics, and subjects pertaining to rural home making taught except in a very meager way. For this reason there are now in the State, and must be for many years to come, many boys and girls and young men and young women who are to live in the country and engage in the pursuits of farming and home making who have had little or no opportunity for instruction in the principles and practices of these subjects, an understanding of which must be so vital to their success and happiness.

Even if good high schools could be established at once in all rural communities of the State, thousands of these persons are too old to be expected to attend the high schools and take the regular high-school courses for the sake of the little time which they might be permitted to devote to these practical subjects. Only the largest high schools could, as high schools are now organized, afford to offer opportunity for a sufficient amount of work in these subjects to take most of the time of any groups of students even for five or six months a year. Most of these persons, though of college age, are not prepared to enter college. Therefore opportunity for them to get any systematic and practical instruction in these subjects must come through schools organized for this particular purpose.

There is almost as much need for some special provision by which many young men and young women between the ages of 18 and 25, living in villages and small towns, may have an opportunity to attend for a few months in the year schools in which boys may be taught in a practical way carpentry, tinning, plumbing, and other forms of wood and metal work, steam fitting, the care and repair of gas engines, etc., and in which young women may be taught home making and the principles and practices of the occupations open for women in these communities.

These schools should admit boys and girls 16 years old and over who have completed elementary-school courses, and more mature young men and young women of even less school preparation. For the convenience of those boys and young men who must work on the farm during the spring and summer, the schools should offer short winter courses and courses of six months, as is now done in the agricultural schools of Minnesota and some other States and in the agricultural school of the North Dakota Agricultural College. For those girls and young women who can attend such a school more conveniently in the summer months, short courses and longer courses of four and a half or five months should be offered. The school should be opened for both sexes both winter and summer.

The survey commission believes the State School of Forestry, at Bottineau, and the State School of Science, at Wahpeton, should be reorganized on this basis and for these purposes. The school at Bottineau might well place most emphasis on agricultural subjects; the school at Wahpeton on mechanical and industrial subjects. Neither of these schools should undertake work of college grade in any of these subjects now nor until the State has become much more populous and the attendance at the State agricultural college has become much larger than it now is. When these conditions shall have come about, it may be found advisable for one or both of these schools and similar schools, which in the meantime may have been established in other parts of the State, to extend their courses so as to include one or two years of college work.

Although the practical subjects of farming and homemaking should take a much larger portion of the time and energies of students in these schools than in the regular high schools, their interest and work should not be limited entirely to these subjects. There should be systematic instruction in the elements of physics, chemistry, and biology as a basis for the more immediately practical work, and in literature, history, civics, and civil government for inspiration and direction in the duties of life and citizenship, but there should be no attempt at teaching foreign languages, ancient or modern. Many of the people of North Dakota who remember the so-called folk high schools and the agricultural schools of the Scandinavian countries from which they have come will understand at once the value of schools of this kind.

It is believed that schools organized on this basis and maintained liberally for these purposes would be largely attended, and that they would accomplish much good. In a State in which the great majority of farmers own and manage their own farms, as in North Dakota, and where there are few tenants and few large farms managed for absentee landlords, there is more need for schools of this kind

than in States in which there are many tenants and many very large farms worked by hirelings directed by managers.

THE NORTH DAKOTA SCHOOL OF FORESTRY.

In the constitution of North Dakota (art. 6, sec. 216), adopted in 1889, provision is made as follows for the establishment of a school of forestry or some other institution somewhere in the group of counties constituting the north central part of the State:

> Fourth. The School of Forestry, or such other institution as the legislative assembly may determine, at such place in one of the counties of McHenry, Ward, Bottineau, or Rolette, as the electors of the said counties may determine by an election for that purpose to be held as provided by the legislative assembly.

The election was held on November 6, 1894, and resulted in the location of the School of Forestry at Bottineau, in the county of Bottineau. The school was opened January 7, 1907.

By an act approved March 19, 1907, the legislative assembly set forth the object of the school as follows: "To furnish the instruction and training contemplated in an agricultural high school, emphasizing those subjects that have a direct bearing on forestry and horticulture."

By an act approved March 11, 1913, the legislative assembly further provided that:

> The president of the School of Forestry shall have general supervision of the raising and distribution of seeds and forest-tree seedlings as hereinafter provided; shall promote practical forestry; compile and disseminate information relative thereto, and publish the results of such work by issuing and distributing bulletins, lecturing before farmers' institutes, associations, and other organizations interested in forestry, and in such other ways as will most practically reach the public. (S. L. 1913, art. 10, sec. 1679a.)
>
> There shall be established in connection with the State School of Forestry and under the direction of the State forester a forest-tree nursery for the propagation of seeds and forest-tree seedlings, which shall be best adapted to the climatic conditions of this State. For such purpose the board of trustees of the School of Forestry shall set apart a tract of not less than 10 acres of the lands belonging to such school. (Sec. 1679b.)
>
> Seeds and seedlings from such nursery shall be distributed to citizens and land owners of this State upon the payment of actual cost of transportation from the nursery to the place where the same are to be planted. As a condition precedent to such distribution, the citizen or land owner making application therefor must agree to plant the seeds and seedlings distributed under the direction of the State forester and in conformity with his instructions. (Sec. 1679c.)
>
> The State forester is required to furnish to each applicant for seeds or forest-tree seedlings, suitable directions for planting the same, and when requested so to do, shall furnish skilled assistants to supervise such work, and in the event that assistance is furnished the applicant therefor shall pay the expense thereof. (Sec. 1679d. Approved Mar. 11, 1913.)

In the Quarterly Bulletin of the school for May, 1915, it is stated that—

> The aims of the school are twofold: (1) To provide practical and efficient instruction in forestry, horticulture, agriculture, nursery and greenhouse practice, manual training, household economics, and academic subjects; (2) as the North Dakota State Nursery to provide free of all expense, except that of transportation, forest trees, seeds, seedlings, and cuttings for planting within our State;

and it is further stated that—

> In line with this work bulletins concerning windbreaks, shelter belts, the planting and caring for trees, etc., will be published as fast as possible.

NOT IN FACT A SCHOOL OF FORESTRY.

It seems that although established as a school of "forestry," the object of which should be "to furnish the instruction and training contemplated in an agricultural high school, emphasizing those subjects that have a direct bearing on forestry and horticulture," the school developed first as "a kind of business college," although it is located in a small town of only about 1,500 inhabitants, and although in the eight counties of Bottineau, Rolette, McHenry, Ward, Pierce, Renville, Benson, and Towner, which this school may be supposed to serve most directly, there is only one town, Minot, of more than 2,500 inhabitants, and only five (Minot included) of more than 1,000, the total population of the five towns in 1910 being less than 12,000. It is stated that when the people became dissatisfied with this type of development an attempt was made to develop in it general forestry, lumbering, and ranger courses, but there were few or no students for these courses. At one time, it is stated, the attendance dropped to less than a dozen students, though the total enrollment for that year is reported as more than 50. Recently the attendance has increased considerably. The total enrollment by years is as follows:

1906–7	32
1907–8	72
1908–9	74
1909–10	75
1910–11	64
1911–12	95
1912–13	52
1913–14	114
1914–15	187

These numbers include the totals for the fall, winter, spring, and summer terms and are much larger than the average attendance or the enrollment for any single term. During the week of April 10–16, 1916, the attendance was 105.

Beginning with 1910, the school has graduated 36 students, but 7 of the graduates received only the elementary certificate, and the majority of these 7 continued as students in the school. Of the remainder, 13 are reported as "advanced," 5 as "collegiate," 8 as "commercial," 3 as "domestic science." Of these graduates only 3 have become farmers, 7 are in business, 6 are teachers, 2 (married women) are home makers, 5 are in professions other than teaching, 12 (including those with elementary certificates) are students in this or other schools. Not one is reported as practicing forestry and only 1 is

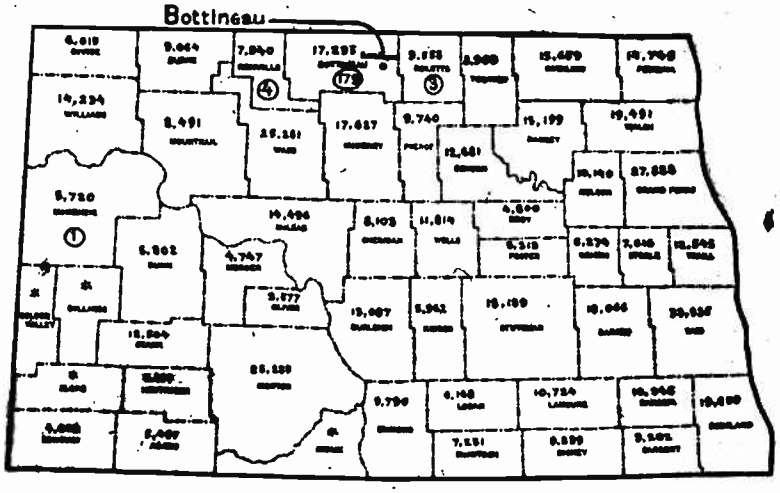

FIGURE 18.—Distribution of students enrolled in the State School of Forestry, 1914–15. See Table 31, p. 136.

The figures above the county name in each case give the population in 1910. At that date the population of Golden Valley County (later subdivided into Golden Valley, Billings, and Slope Counties) was 10,186; and the population of Morton County (later subdivided into Morton and Sioux Counties) was 25,289. The population of the State was 577,056.

The figures inclosed in the circle in each case indicate the number of students from the county who are enrolled at the School of Forestry.

This institution drew 187 students from 4 counties in North Dakota, and 8 students from without the State; of the entire number of sudents, 11 came from outside of Bottineau County.

reported as being a student at the North Dakota Agricultural College, although 3 are students at the University of North Dakota. Judged by the occupations of its graduates the school has functioned neither as a school of agriculture nor as a school of forestry. To a larger extent than any of the State schools under the immediate control of the board of regents the school at Bottineau is a local school. Of the 187 students enrolled from the State of North Dakota in 1914–15, 179 were from Bottineau County, 4 from Renville, 3 from Rolette, and 1 from McKenzie. Of those from Bottineau County a very large proportion were from the town of Bottineau.

SMALL CLASSES.

The waste of time and energy of teachers because of the large number of very small classes reaches its maximum in this school. The average attendance of 132 class meetings held during the week of April 10–16, 1916, was only 6.1 students. Only 42—or 32 per cent—of the class meetings had an attendance of more than 5.[1] Only 22—or 16.6 per cent—had an attendance of 10 or more. At 85 class meetings of 18 classes having less than 5 students the total attendance was 237, an average of 2.8 students. There were 14 class meetings with only 1 student and 30 with only 2 students. The costliness of these excessively small classes is indicated by the fact that of each $100 expended for instruction during this week $59.10 was expended for the instruction of classes having less than 5 students and $83.30 for the instruction of classes having less than 10 students. (See Table 42 and fig. 23.) For students of the grade represented in this school so large a number of small classes must be considered as very wasteful.[2]

The reasons for the large number of very small classes in this school are: (1) The vertical spread from classes of elementary school grade through four years of high school and one or two of collegiate grade; and (2) the wide horizontal spread to include academic, agricultural, horticultural, forestry, commercial, domestic science, manual training, pedagogy, and music courses. Fortunately, many of the subjects offered, as Latin, German, advanced English, and courses in harmony, are not taken.

It should be noted that a majority of the students in elementary manual training classes are boys from the elementary grades of the public schools of Bottineau, who take one lesson a week, and more than half of the students taught by the teacher of household economics are in classes of fancy cooking and crocheting. Many of these are women in the town of Bottineau who take only a few lessons a year. These and similar facts account for the low average number of class meetings attended weekly by each student—only 7.7 during the week of April 10–16, as against averages of from 15.8 to 26.1 at other schools included in this survey.[3]

LITTLE DEMAND FOR BUSINESS COURSES.

That there is no real demand for the commercial dpeartment in this school is indicated by the fact that, as President Smith says, the only distinctive things about the department, as it exists here, are stenography, typewriting, bookkeeping, and commercial law,

[1] See Table 39, p. 148.

[2] Of the 105 students present that week, 11 were above high-school grade, 70 in classes of high-school grade, 23 in classes below the high school, and 1 was classified as special.

[3] See Table 41, p. 151.

and that, in April, 3 classes in stenography had a total enrollment of 8 students, 2 classes in typewriting a total of 12 students, and 1 class in bookkeeping 9 students.

During the year 1914–15 there were only 10 students in farm forestry, including 4 in animal husbandry, and only 6 in pedagogy. In April, 1916, there were only 2 students in advanced chemistry, 4 in college English, 1 in ancient history, etc. In no class above high school grade were there more than 4 or 5 students. It would have been much better for these students and much cheaper for the State had those taking college subjects been taught in similar classes at the university or at the agricultural college, and if those taking pedagogy had gone to one of the normal schools.

BUILDINGS AND GROUNDS.

The school of forestry has a main building valued at $55,000 and a greenhouse valued at $3,000. It has 35 acres of land used for campus and nurseries, and a tract of 160 acres recently purchased to be used for the development of nurseries. The equipment of the school is valued at $7,756.90. The salary budget for the year 1915–16, including the salaries of the president and the secretary, is $10,535. The total income of the school for 1914–15 was:

Mill tax	$4,283.63
State warrants	6,683.76
Miscellaneous	1,316.12
Total	12,283.51

This is hardly enough for the support of a good agricultural school of the kind recommended by the survey commission, but it can be made to accomplish much more than it now does if only the legitimate work of such a school is undertaken.

RECOMMENDATIONS.

A careful study of the history of this school makes it quite clear that its difficulties have been due to the fact that there has been no real demand here for most of the work which it has tried to do, and to its attempt to cover too great a variety of subjects and to extend its work over too many grades. Plainly the school will find itself only when it abandons all other purposes and, fitting itself for it, undertakes to do only the kind of work recommended in the first part of this chapter, and in the "Summary of Conclusions and Recommendations.[1] Doing work of this kind, it should soon have a reasonably large attendance from all the northern and central counties of the State. The curriculum should not attempt to cover more than three years and should be made as strong as possible

[1] See recommendations 32 and 33, ch. 12.

in practical agricultural subjects and in home economics. In this work it should have the constant advice and guidance of the agricultural college and the assistance of its extension workers and of farm demonstration and county agricultural agents of all kinds. Through the help of these it should enrich the work done within its walls and on its campus and farms by home projects carefully planned by the school and worked out by the students in their homes and on their home farms.

The survey commission agrees with Mr. Smith, the president of this school and the State forester, that the teaching of forestry and the management of nurseries should be transferred to the agricultural college, which has the machinery and the organization whereby forestry work may be carried on successfully in the State. The college now has 5 substations and 22 model farms. The substation at Mandan is required by law to make experiments with trees, and other substations might well carry on similar experiments and conduct small nurseries. These nurseries should be located with reference to convenience of distribution. The fact that railroads from all parts of the State converge at Fargo makes this a convenient distributing center and would seem to make it advisable to establish large nurseries here. The college will in time have agricultural agents in all the counties of the State and will be sending out field workers in all forms of agriculture and home economics and also in other subjects. So important is the growing of trees to the State that the college might well consider the establishment of small nurseries, for local distribution, at other State institutions and at agricultural high schools. It is recommended that the nurseries already established at Bottineau be continued under the direction of the agricultural college.

It need hardly be said that the school of forestry which should be developed at the agricultural college for the service of the State of North Dakota should be quite different from schools of forestry in Montana, Washington, California, Oregon, New York, North Carolina, and other States having vast forests and timber industries. In these States the problems of forestry are largely of lumber engineering; but in North Dakota the problems are of tree planting, afforestation, providing windbreaks for homes and farms, conserving rainfall, and providing wood and timber for home and commercial use. In European countries this latter kind of forestry has received much attention and is in charge of highly trained experts. In New England the growing of timber for manufacturing purposes has begun to receive attention.[1]

The interest which the people of North Dakota are taking in this subject is attested by the fact that the legislative assembly has en-

[1] Dr. Liberty H. Bailey, of Cornell University, has emphasised the fact that timber growing is as much a proper agricultural interest as the growing of corn or potatoes.

acted a law providing a bounty, under certain conditions, for the planting and cultivation of trees.

THE NORTH DAKOTA STATE SCHOOL OF SCIENCE.

The constitution of North Dakota made it incumbent upon the legislative assembly of the State to provide for a scientific school or some other institution [1] at Wahpeton, in Richland County, and apportioned for the support of this school 40,000 acres of the congressional grant of public lands for institutions of higher learning in the State. The legislative act providing for this school was approved March 10, 1903, and the school was opened in September, 1904.

The first two years the school was held in rented buildings. In 1905 the trustees purchased for the use of the school the building and property of Red River Valley University. The present value of buildings is estimated at $113,020. The present value of equipment is estimated at $25,082.25. The total income of the school for 1914–15 was:

Mill tax	$8,552.46
Interest and income	18,335.56
State appropriation	5,000.00
Fees	2,392.75
Total	34,280.77

The purpose of the school as defined by statute is—

to furnish such instruction in the pure and applied sciences, mathematics, languages, political sciences, and history as is usually given in schools of technology below the junior year, the chief object being the training of skilled workmen in the most practical phases of applied science.

The president of the school indicates the following as the classes of students the school desires to serve:

1. Students who are 16 years of age, who have no definite educational preparation, and yet feel the need of further vocational or industrial training.
2. Students who have finished the sixth grade or more in the rural schools and who, though bright but outclassed in age, desire to prepare for courses requiring eighth-grade preparation or for some vocational course.
3. Students who have graduated from the eighth grade and desire to take a vocational course immediately.
4. Students who have graduated from the eighth grade and desire vocational guidance and cultural courses.
5. Students who have graduated from high school and desire to learn a trade or vocation immediately.
6. Students who have graduated from high school and desire vocational training along with the higher cultural courses.
7. Students who have graduated from college and desire only the special technical training in a trade or vocational course.

[1] "Fifth. A scientific school, or such other educational or charitable institution as the legislative assembly may prescribe."

The president sums up the courses offered or that should be offered under the following heads:

	Courses.
Agriculture	3
Business and commerce	4
Home economics	3
Industrial arts	2
Industrial engineering	5
Special winter term	6
Teacher training	2
Trade	8
Vocational preparatory	4

The grade of students served by these courses extends from the seventh grade of the elementary schools through the second college year, a range of eight years.

Of 344 graduates to the end of the school year 1914–15, 219 have graduated in commercial subjects, 34 in domestic science, 48 in high-school academic courses, 22 in junior-college academic courses, and only 17 in all forms of engineering, as follows:

Steam engineering	6
Mechanical engineering	5
Electrical engineering	5
Chemical engineering	1

In electrical engineering there has been only one graduate in any one year. Of these 344 graduates, 137 were reported as engaged in business and 47 in farming. Only 12 are reported as engaged in any mechanical occupation involving applied science, as follows: Chemist, 1; mechanical engineers, 4; electrical workers, 7.

SMALL CLASSES.

As a result of the wide vertical and horizontal spread of the work in this school the faculty of 21, including president and secretary, were giving, in the spring of 1916, 92 different courses to 106 students. In 124 meetings of 27 classes having less than 5 students during the week of April 10–16, 1916, there was a total attendance of 362 students, an average of 2.9 students. Out of a total of 305 class meetings that week, 10 had 1 student, 53 had 2 students, 5 had 3 students, 36 had 4 students, and 25 had 5 students; 68.2 per cent of the class meetings were attended by less than 10 students. Among the small classes were 4 classes in German, with 8, 2, 2, and 4 students, respectively; a class in Latin, with 2 students; 3 classes in shorthand, with 4, 2, and 2 students, respectively; a class in dietetics, with 1 student; a class in textiles, with 1 student; a class in mechanism, with 2 students; and a class in education, with 8 students.

Of every $100 expended for instruction during that week, $34.10 was for classes of less than 5 students and $68.20 for classes of less than 10 students.

The attendance for 1914–15 was:

Fall term	153
Winter term	236
Spring term	155
Summer term	100

The average for the three regular terms was 180. Of the 370 different students enrolled, 107 students entered with 15 or more units of preparation, 263 with less than 15 units. Of the 107 students entering with 15 or more units, only 78 were from North Dakota. If these had been cared for at the university and the agricultural college, they would have added very little to the burden of teaching in either institution.

SOURCE OF ATTENDANCE.

In any discussion of the place of the School of Science in the educational system of North Dakota and of the work it should undertake to do, it should be remembered that of the total attendance (in 1914–15) something more than 35 per cent were from other States than North Dakota, something more than 51 per cent from Richland County, and something less than 14 per cent from other North Dakota counties; that the school is located within easy reach by rail of the agricultural college, the university, and the normal schools at Mayville, Valley City, and Ellendale; and that, although this section of the State is a rich farming section, it is also the section having the largest per cent of urban population. (See Figure 19.)

RECOMMENDATIONS.

The survey commission believes that the school may find its greatest usefulness as a high-class industrial school, or school of mechanical trades, with such courses in agriculture as may seem advisable, but giving at present no work of college grade. It should give special attention to industrial subjects both for boys and girls, and it might be well to include also commercial subjects, such as bookkeeping and stenography, but it should avoid becoming a local elementary or high school. The commission recommends elsewhere that the State board of regents establish at Bottineau a six months' school especially adapted to needs of boys preparing to become farmers, and a four and one-half or five months' summer school especially suitable for girls wishing to study home economics and allied subjects, both the winter and summer schools, however, being open to both boys and girls. If the experiment at Bottineau proves

successful, a similar plan might also be tried at Wahpeton, which is already fairly well equipped for the conduct of courses similar to the courses below college grade offered at the agricultural college.

As already stated, with the increase in population and wealth of the State and of attendance of students at the university and agricultural college, it may be well for the school at Wahpeton to become

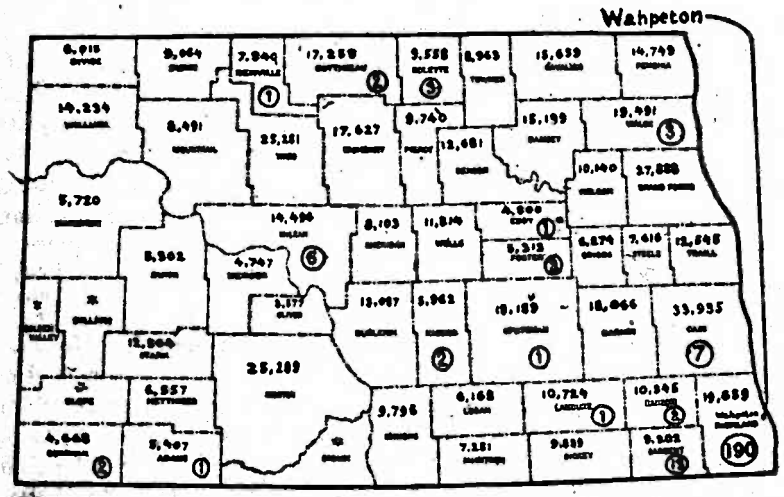

FIGURE 19.—Distribution of resident students enrolled in the North Dakota State School of Science at Wahpeton, exclusive of summer session, 1914–15. See Table 31, p. 136.

The figures above the county name in each case give the population in 1910. At that date the population of Golden Valley County (later subdivided into Golden Valley, Billings, and Slope Counties) was 10,186; and the population of Morton County (later subdivided into Morton and Sioux Counties) was 25,289.

The figures inclosed in the circle in each case indicate the number of students from the county who are enrolled at the North Dakota State School of Science at Wahpeton.

This institution drew 238 students from 16 of the 52 counties in North Dakota (of whom 79.8 per cent came from Richland County) and 132 from without the State; total, 370.

Only 1 county, outside of Richland County, sent more than 7 students to Wahpeton; Minnesota sent 105 and South Dakota sent 11.

a junior college of science and technology, but it does not appear to the commission that there is at present any demand for a separate school of science or of technology of junior college grade.

Chapter IX.

THE STATE LIBRARY COMMISSION.

Chapter 156, laws of 1909, assigns to the public library commission the following duties:

1. To administer the educational reference library.
2. To administer the traveling libraries.

It shall take over and add to the educational reference library and the system of traveling libraries, and shall continue the same, and, as its funds permit, shall increase the number and usefulness of the libraries. Any city, town, village, school district, or community within the State of North Dakota may borrow books under the rules and regulations of the State library commission. The commission shall catalogue and otherwise prepare said books for circulation and shall make rules and regulations according to which the business of the commission shall be done; and also such rules and regulations as shall insure the care, preservation, and safe return of all books loaned.

3. To establish and administer a legislative reference bureau.

The State library commission shall have the power and it shall be its duty to establish a legislative reference bureau for the information and assistance of the members of the legislative assembly in the work of legislation. The legislation of other States and information upon legal and economic questions shall be classified and catalogued in such a way as to render the same easy of access to members, thereby enabling them better to prepare for their work. It shall be the duty of the legislative librarian to assist in every way possible the members of the legislative assembly in obtaining information and in the preparation of bills.

4. To give advice in regard to the organization, maintenance, and administration of libraries.

The librarian or trustees of any free public library or the trustees of any village, town, or community entitled to borrow books from said traveling libraries may, without charge, ask and receive advice and instruction from said library commission upon any matter pertaining to the organization, maintenance, or administration of the libraries.

5. To aid in the formation of new libraries and the improvement of those already in existence.

And said commission shall, as far as possible, promote and assist by counsel and encouragement the formation of libraries where none exist, and the commission may also send its members to aid in organizing new libraries or improving those already established.

6. To collect statistics of the free public libraries of the State and to report its own activities.

The State library commission shall keep statistics of the free public libraries of North Dakota and a record of the work done and books loaned by said commission, and shall make a full report to each general session of the legislature.

of all expenditures by the commission, and of such statistics and records as shall show the work done by the commission and the use made of the traveling libraries and all other matters which they deem expedient for the information of the legislature.

These duties now devolve upon the board of regents, but they are discussed here as belonging to the library commission.

ORGANIZATION.

The commission has organized its work under the following divisions:

1. Educational reference department.
2. Traveling library system.
3. Legislative reference bureau.
4. Field work.

There are department heads for divisions 2 and 3. The secretary and director has immediate charge of divisions 1 and 4. The office of the commission is in the capitol at Bismarck. It appears that the secretary and director and the two heads of departments have the assistance of only one stenographer and one clerk, and that for lack of more assistance all the work of the commission is impeded. It also appears that the efficiency of the legislative reference bureau has been impaired because of lack of funds for printing bulletins on subjects of legislative interest to the people of the State and their representatives; that only slight additions have been made to the educational reference library and the traveling libraries within the last few years, and that the field work has been much less extensive and helpful than it might have been. Evidently there is need for considerable increase in the appropriations for all this library commission work if it is to accomplish for the State what was originally intended and meet fully the ever-larger demands of the rapidly increasing population and a constantly growing interest in all phases of the work.

The librarian of the legislative reference bureau reports that, in compliance with law, he has collected and compiled the laws of other States and information concerning questions of economic and legislative interest, has made files of bills introduced in the Legislative Assembly of North Dakota, and assisted legislators and legislative committees in drafting bills. The bureau now has a collection of 15,000 or more clippings arranged for the use of legislators. When the legislature is not in session, articles from the collections of this bureau are sent by the educational reference department to those who request them. The survey commission has made no detailed investigation of this bureau, and has no recommendations to make in regard to its work, except that the librarian should be given sufficient assist-

ance to enable him to bring and keep up to date the work both of compiling and digesting laws and of cataloguing and indexing the collections, and that sufficient funds should be available to enable him to print necessary bulletins for the information of the people on questions of legislative interest.

The work of the educational reference division, formerly done by the department of public instruction, consists of correspondence with individuals, principally club women and teachers and pupils in the schools. It is especially helpful to rural homes and small communities without libraries. The reference library has something less than 4,000 volumes and about 15,000 mounted clippings from magazines and newspapers. It also uses the clippings of the legislative reference bureau when the legislature is not in session.

The traveling libraries, also especially helpful to rural communities, villages, and small towns, are of four kinds:

Community collections.
School collections.
Small school collections for grades below the sixth.
Farmers' libraries, consisting of technical books on agriculture.

Six sets of these last are reported. Of all these kinds of collections the traveling library system has between 300 and 400 sets. An inspection of the library map, page 126, shows that the traveling libraries reach all parts of the State, but, unfortunately, the number of these libraries is so small that only a very small per cent of the communities of the State can be served in any one year. Five or ten times as many could be used to great advantage.

The field work is supervision of all libraries in North Dakota and promotion of its library interests within and without the State. It includes fostering of library spirit, organization of new libraries, advice on technical and administrative problems, planning new buildings, selection of books and librarians, and instruction in library methods. There is a great need of field work among public libraries not able to employ trained librarians, in communities wishing to organize public libraries, and especially in school libraries. In an agricultural State destined to undergo the rural development fast coming to North Dakota, but still only sparsely settled, the furnishing of library facilities must long remain, in some communities, at least, with the school library, which also supplies community needs. Whether known as the school or township or county library, some agency must see that money is wisely spent in purchasing books, that the books when purchased are arranged and cared for so that their contents are easily available at the time needed, and that a uniform system is used, so that teachers and pupils from any school in the State will at once feel at home in any public library in the State. This work is a special province of the library commission.

The library in charge of the library commission not only ministers to the communities having no public libraries, but it supplements in an important way all the local public libraries of the State. With sufficient means to purchase some classes of books in sets of a half dozen or more, it might render great service in this last way.

INSTITUTION LIBRARIES.

It seems that the libraries of the university, the agricultural college, and the normal schools loan their books, to some extent, beyond their walls, as they should if they have the machinery for it. But the survey commission can see no danger of duplication or conflict of interests between these institutions and the library commission, so long as the libraries of the educational institutions resist all temptation to become circulating libraries, or to spend their incomes for books to be used only, or chiefly, for this purpose. In fact, the library commission might well arrange with these libraries to supplement the service of its educational reference library and refer to them requests for books not in this collection. These libraries, however, should avoid all effort to cover the general field of the library commission. They will need, no doubt, to use all their money and efforts in perfecting themselves for the immediate service of the institutions of which they are a part. Service beyond their walls should be only secondary, and to a large extent only supplementary, to the service of the library commission. In this secondary and supplementary service, each institutional library should have its own definite field.

The university library should be able to furnish to those who need them special and technical books upon subjects covered by the university curricula. The agricultural college should perform a similar service for students interested in special agricultural and other problems related to the work of that institution. The libraries of the normal schools should be rich in educational literature, dealing especially with the problems of elementary education, and these should be available both for teachers and for the people of the State interested in such problems.

The number of large libraries in North Dakota and the consequent demand for highly trained librarians are not now, nor will they be for some time, sufficiently large to justify extensive courses in library work at more than one institution, but there is need for instruction in the simplest and most elementary principles and practices of library work for those who have the care of the smaller libraries, and especially for teachers in the public schools who are responsible for the selection and care of books in the school libraries. Such instruction should be provided at the university and normal schools, and especially in the summer sessions of these schools. That

there may be uniformity in this instruction, and therefore in library practice throughout the State, courses in library work should be planned by the secretary and director of the library commission, and the work inspected by her from time to time. She might also arrange for apprentice instruction at some of the larger libraries. The commission should have in its employ an organizer who should give most of her time to visiting schools and small libraries to give the practical help for which there are constant demands. When school boards understand more fully how important it is for teachers to have sufficient knowledge of the care and use of books to make the small school libraries most useful, and when they realize that money paid for books is practically thrown away unless the information contained in these books can be made available when needed, the demands for library instruction and for the help that such an organizer could give will be much greater than they are now.

LOCAL LIBRARIES.

The very liberal laws in North Dakota in regard to city, village, township, and school libraries show the intelligence of the people in regard to the value of books and of the habit of reading.

City councils and boards of villages and townships containing more than 400 inhabitants have the power to establish and maintain public libraries and reading rooms, and, when authorized by a vote of the people at a general election, may levy annually and cause to be collected taxes not exceeding 4 mills on the dollar for their support. In any city in which the sum of $400 or more has been donated for the benefit of a public library the council may appropriate to such library as much as $200 from the general fund without the authority of a vote. In like manner the board of trustees of a village or the board of supervisors of a township of not less than 400 inhabitants in each case may appropriate $100 from the general fund of the village or township for the use of a public library when the sum of $150 or more has been properly donated for the benefit of such library.

Section 1176 of the school laws requires the district school board to—

> appropriate and expend each year not less than $10 nor more than $25 for each school of the district for the purpose of a school library, to be selected by the school board and the trustees from any list of books authorized by the superintendent of public instruction and forwarded by him to the county superintendent for that purpose * * * provided * * * that when a school board of a common school has purchased and has in their library 200 books as aforeprovided that the school board having such school under their supervision shall be obliged to expend not less than $5 annually until such library shall contain, in good condition, 300 volumes, after which said school board shall not be obliged to purchase so as to increase the number, but shall keep the books in good condition and replace annually as many books as may become lost or destroyed.

The large proportion of rural population in this State makes these laws in regard to village, township, and school libraries all the more desirable and beneficial, but the needs of the people for books and magazines can never be fully supplied by these small libraries, even when supplemented to the fullest possible extent by the traveling libraries of the library commission and by the circulation of books from the educational reference library. They are too small to supply more than the most elementary needs of the community. Though each of the 100 schools of a county might have its 300 volumes, making a total of 30,000 volumes in the school libraries of the county, and though these might be supplemented by a dozen or more small village and township libraries, still there would be available for the use of the people of any one community only a very

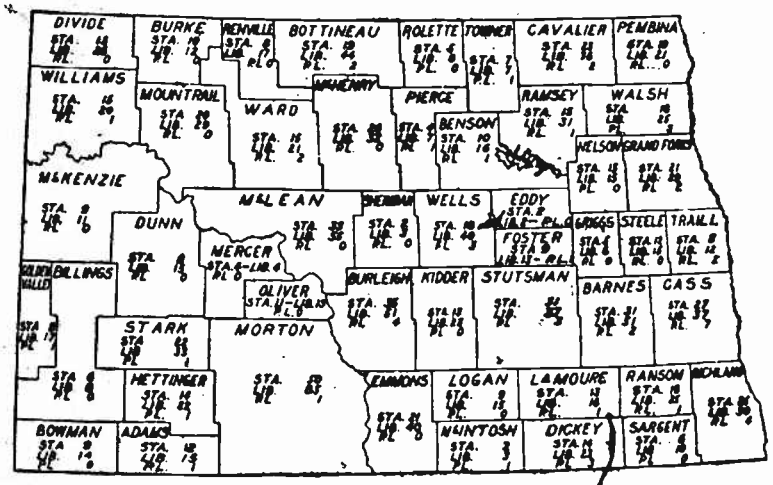

FIG. 20.—Distribution of traveling library stations (Sta.), traveling libraries (Lib.), and public libraries (P. L.) in North Dakota, by counties, 1914.

limited number and variety of books. To meet fully the needs of the people will require libraries larger than can be maintained by the small units of school district, village, and township. It will require the cooperation of county and State. In bringing about this the library commission should find its greatest opportunity for usefulness.

The fourth biennial report of the North Dakota State Library Commission (1912–1914) gives only 9 public libraries having 3,000 or more volumes on July 1, 1914, and only 28 having less than 3,000 volumes on the same date, a total of 37 public libraries of all sizes in the State. The 9 libraries having 3,000 or more volumes each had a total of less than 50,000 volumes and a total income of less than $80,000. The 9 towns which they serve had a population of less than

60,000 in 1910, probably less than 75,000 in 1914. The United States Bureau of education in 1916 reported 8 libraries in this State having more than 4,000 volumes each. These 8 reported a total of less than 50,000 volumes, a total income of less than $30,000, and less than $4,000 expended for books within the year. In 1916 there were only 4 libraries having as many as 5,000 volumes, and these served a total of not more than 50,000 of the 700,000 (estimated) people of the State. Less than 10 per cent of the people of the State have easy access to any adequate collection of books. (See Table 25 and fig. 20.)

TABLE 25.—*North Dakota public libraries, 1916.*

Location.	Name.	Librarian.	Number of volumes.	Accessions.	Income.	Book expenditures.
Devils Lake	Carnegie Library	Dorothy Dodge	4,253	392	$1,918	$228
Dickinson	Public Library	Helen F. Carleton	4,207	509	1,721	375
Fargo	do	Winnie Bucklin	9,825	1,232	5,833	579
Grand Forks	do	Adah Durand	10,000	631	4,000	656
Jamestown	do	Alice M. Paddock	6,500	321	2,147	261
Minot	Free Public Library (1 station).	Margaret Greene	6,000	870	4,500	785
Valley City	Carnegie Public Library	Lillian E. Cook	4,652	617[1]	2,666	696
Williston	James Memorial Library	Bessie R. Baldwin	4,192	807	3,849	402
Total			49,629	4,879	26,634	3,982

[1] At Bowman, N. Dak., a new public library building was opened in January, 1916.

COUNTY LIBRARIES.

The taxable property of small towns, villages, townships, and rural school districts is not sufficient to enable them to support good public libraries alone. The public libraries owned and controlled by cities and towns seldom reach the people of these smaller communities. The only help for all is in the county library, supported by taxes levied on all the taxable property of the county, managed by a trained librarian, having branches in all the more important towns and villages of the county, and using the schools as distributing centers. Cooperation of smaller units through the larger units of which they are parts is as necessary for the best results in this as it is in all other matters of public welfare. That no county, however poor, may be without the means of supporting such a library, there should be State aid for public libraries just as there is for public schools. The people of no community should, through lack of means in that community, be deprived of free access to all the books of which they can make good use.

The survey commission recommends that the legislative assembly of the State be requested to make legal provision whereby counties may establish and maintain libraries to be administered and used as here suggested. It believes that this provision should contain some form of State aid for the support of these county libraries.

Under such provision the libraries already established in the larger cities and towns of the State might be transformed immediately into county libraries with larger support than the municipalities alone are able to give them. This would not only extend the privileges of the libraries to all the people of the county, but would enhance the value of them to the municipalities themselves. Libraries would then no doubt be established in other counties, beginning with the most populous and most wealthy and extending to the less populous and less wealthy as rapidly as they could be induced to assume the burden of their support. At present approximately one-third of the counties of the State have a population of more than 15,000, and more than one-half have a population of more than 10,000. It should not be difficult for any of these counties to provide the funds for a building, books, and their proper care and administration for a library of 30,000 volumes. A library of this number of carefully selected books would be amply sufficient for any county in the State, and especially if many of the most popular books were owned in sets of from three to six and if all the county libraries were supplemented by the educational reference library enlarged for this purpose. For this supplementary work this reference library should have many books on special subjects which might be called for sometimes, but not frequently, in any county library, and which could be sent to county libraries or to individual readers on request. Books of this kind the educational reference library should have in sets of from three to five. By this means the county libraries would be relieved of the necessity of purchasing many costly books.

The county library should be located at the county seat, where the roads converge—trolley lines sometimes, railroads frequently, country roads always—and to which the people come to transact their legal business and for other purposes. The libraries should be housed in suitable buildings of a good and attractive style of architecture as soon as means can be had for this, but the cost of buildings should not be permitted to deter counties from establishing and maintaining libraries, temporary quarters for which might usually be found in the county courthouse or elsewhere at little expense. Books, and proper care in their circulation, are more important than the buildings in which they are housed. In most counties, no doubt, money could be had for buildings without the necessity of taxing the people for them.

It is impossible to estimate the good that might come to the people of North Dakota from such a system of libraries. It would increase in large measure the value and effectiveness of the State's system of public education. It would be especially helpful to those, the great majority of the people of the State, who live in the open country and in villages and small towns, and most helpful of all to those liv-

ing in remote, isolated farm homes. For many reasons these people have more time for reading than city people have. On Sundays, on rainy and snowy days when little or no work can be done outdoors, and on long winter evenings—very long in this northern latitude—much time for reading can be found by children and older people alike, and it comes in larger sections and with fewer interruptions than time for reading comes to those who live amid the distractions of city life. It is also true that country people will read, when they have opportunity, the best books with appreciation and profit. They read less for time-killing and mere entertainment and more for information and inspiration. Their close and familiar contact with nature and the simple fundamental things of life gives them more power of interpretation of the great literature of nature and life than city-bred people are likely to have. It should also be remembered that their opportunities for education in the schools and through lectures, plays, art galleries, museums, and other similar agencies being more limited than are those of the people of the cities, these country people have, therefore, the greater need of the services which only such a system of libraries as is here recommended can give.

The cost of upkeep of the libraries when once established will not be large. The total cost for all the counties would probably not exceed 6 or 7 per cent of the total annual expenditures for public schools.

Chapter X.

STATISTICAL COMPARISONS.

A careful examination of the work of the several institutions, with the view to elimination of any unnecessary duplication of effort that might be found to exist, was emphasized in the outline of duties of the board of regents formulated by the legislature. To assist in an understanding of the problem, the tables in the following pages have been prepared. Since unnecessary duplication of work of college grade is presumably more expensive than is the case with courses of lower grade, and since normal schools and high schools are necessarily sectional or local schools of practically the same character and for the same purpose, respectively, special attention is given to a study of conditions in the university and the agricultural college.

EMPLOYEES AT UNIVERSITY AND AGRICULTURAL COLLEGE.

Table 26 presents a condensed summary of the employees for 1915–16 at the university and the agricultural college. With approximately the same number of resident students at each institution (see Table 28 for figures for 1914–15):

(1) The university makes use of an instructional staff nearly 60 per cent greater than that of the agricultural college (82 and 52, respectively). This difference may be explained partially by the fact that the university has a larger number of students in continuous residence than the agricultural college, approximately half of the resident student population at the latter institution being reported in special short-term classes.

(2) The number of employees classed as administrative and executive is more than twice as large at the agricultural college as at the university (13 and 6, respectively).

(3) The university employs twice as many engineers, janitors, and laborers as the agricultural college (22 and 11, respectively).

(4) Exclusive of those employed for the correspondence, extension, and research divisions, and for the summer session, the university staff is more than 50 per cent greater than that of the agricultural college (139 and 91, respectively).

A further analysis of the employees at the two institutions is given in Table 27. Attention is called particularly to the following points:

(1) With an enrollment of fewer than 100 students in engineering, the university maintains an instructional staff in this division of 17, including 2 deans.

(2) With a total instructional staff of 52, the agricultural college has only 5 assigned to agriculture, while 9 are assigned to engineering and 12 to general science. The number of instructors assigned to general science as compared with the number assigned to agriculture, which may properly be assumed to be the important department of the college, seems to the survey commission to be entirely out of due proportion.

TABLE 26.—*Employees at university and agricultural college, 1915–16.*

SUMMARY.

	University.	Agricultural college.
Instructional staff	82	52
Correspondence, extension, research	7	60
Administrative, executive	6	13
Clerks, librarians	15	18
Engineers, janitors, laborers	22	11
Commons employees	16	8
Total	148	162
Deduct those counted more than once	2	11
Net total	146	151
Summer session	22	11
Grand total	168	162

STUDENT ENROLLMENT AT UNIVERSITY AND AGRICULTURAL COLLEGE.

Table 28 presents a summary of the students enrolled for the year 1914–15 at the university and the agricultural college, classified according to departments. Attention is called to the following points:

(1) The numbers of students reported as entering with 15 high-school units of credit, line 2 of the table, is somewhat misleading, since a large number of those who entered the university with less than 15 credits were admitted with 14½ units, and none with less than 14 units, and at the agricultural college a considerable number of students were admitted to the special short courses without reference to scholastic attainments.

(2) Approximately one-half of the total enrollment at the university consists of regular-term students of college grade (675 out of 1,241), whereas the proportion of such students at the agricultural college is only a little more than one-fourth (319 out of 1,171).

(3) Two college departments at the university and seven at the agricultural college registered fewer than 10 students each.

TABLE 27.—*Employees at university and agricultural college, 1915–16.*

	University of North Dakota.							North Dakota Agricultural College.						
	Total.	Deans.	Professors.	Associate professors.	Assistant professors.	Instructors.	Assistants.	Total.	Deans.	Professors.	Associate professors.	Assistant professors.	Instructors.	Assistants.
I. Total, exclusive of names repeated	168							162						
II. Instructional staff (total, exclusive of summer session and names repeated)	82	7	21	5	15	23	11	52	4	20	2	12	12	2
(A) The colleges (total, exclusive of names repeated)	72	6	21	5	15	15	10	49	4	20	1	11	11	2
(1) Agriculture								5	1	3		1		
(2) Biology	3		1		1		1	5	1	1	1	1	1	
(3) Chemistry	5		1		1	2	1	5	1	3			1	
(4) Education	4	1	2		1			1		1				
(5) Engineering (total)	17	2	4		3	5	3	9	1	1		2	4	1
(a) Architecture								1					1	
(b) Chemical	2		[1] 1			[2] 1								
(c) Civil	1		1					1		1				
(d) Electrical	1				1									
(e) Mechanical	6	1	[3] 2		1	2		2				2		
(f) Mining	7	1			1	2	[4] 3							
(6) Home economics	3					1	2	5		1			3	1
(7) Law	6	1	2		1	2								
(8) Liberal arts, general science	34	1	12	4	7	5	5	12		6		4	2	
(9) Medicine	5	1	1	1	1	1								
(10) Military science								1		1				
(11) Pharmacy								2		1		1		
(12) Physical training								1		1				
(13) Veterinary medicine and surgery								3		1		2		
(B) High-school department	9					[8]	1	2				1	1	
(C) Not assigned to specific departments	1	[1] 1						2						
III. Summer session	22							11						
IV. Correspondence division	1													
V. Extension division	1							21						
VI. Experiment station, research	5							[7] 39						
VII. Administrative, executive	[6] 6							[9] 13						
VIII. Stenographers, clerks, librarians, etc.	15		[5]					18						
IX. Engineers, janitors, laborers (not including students)	22							11						
X. Common employees (not including students)	16							8						
XI. Counted more than once	2							11						

[1] Repeated in chemistry.
[2] Repeated in mining.
[3] One repeated in liberal arts.
[4] Two repeated in station and research.
[5] Repeated as assistant professor in liberal arts.
[6] One repeated as professor.
[7] Nine repeated elsewhere.
[8] Two repeated elsewhere.

TABLE 28.—*Summary of students at university and agricultural college, 1914–15.*

[According to figures verified by the registrars' offices.]

	University.	Agricultural college.
I. Grand total (excluding duplicates)	1,241	1,171
(1) Entered with 15 or more high school units	553	304
II. Graduate students	7	.....
III. Students in the colleges (total)	675	319
(1) Agriculture	.....	95
(2) Biology	.....	1
(3) Chemistry	.....	4
(4) Education	162	7
(5) Engineering (total)	83	36
(a) Architectural	.....	7
(b) Architecture	.....	5
(c) Chemical	.....	2
(d) Civil	17	7
(e) Electrical	11	.....
(f) Mechanical	6	15
(g) Mining	9	.....
(h) Engineering, freshmen (unclassified)	40	.....
(6) Home economics	.....	74
(7) Law	92	.....
(8) Liberal arts or general science	279	37
(9) Medicine	59	.....
(10) Pharmacy	.....	15
(11) Veterinary medicine and surgery	.....	14
IV. Students in subcollegiate courses (total)	315	656
(1) Industrial and special (total)	.....	242
(a) Drafting and building (22 weeks)	.....	6
(b) Farm husbandry	.....	118
(c) Power machinery	.....	75
(d) Home making	.....	26
(e) Pharmacy	.....	17
(2) Winter short courses (total)	.....	276
(a) Agriculture	.....	50
(b) Engineering	.....	204
(c) Domestic science	.....	22
(3) High school	107	138
V. Students in summer session (total)	336	258
(1) Teachers summer school	.....	36
(2) Engineering summer school	.....	75
(3) Cass-Ransom Counties summer school	.....	147
VI. Students in correspondence courses	116	.....
VII. Names counted more than once	208	62

Table 29 presents an analysis of the student registration at the two institutions, exclusive of summer session, the percentage distribution being exhibited in figure 21. Approximately three-fourths of the regular year's work at the university is thus shown to be of college grade, compared with less than one-third at the agricultural college. Engineering constitutes less than 10 per cent of the total at the university and less than 4 per cent at the agricultural college. Work in agriculture of college grade involves only 10.1 per cent of the total registration at the agricultural college.

The analysis is carried still further in Table 30, in which only students of college grade, exclusive of summer session, are considered; see also figure 22. The department of liberal arts, with 41.3 per cent of the college students, is the core of the university, with the other departments in what seem to be reasonable proportions; while at the agricultural college, agriculture constitutes only about one-third (33.6 per cent) of the whole. Engineering occupies about

the same relative space in the two institutions, 12.3 per cent and 12.7 per cent, respectively.

Instead of the department of agriculture dominating the situation at the agricultural college, as might naturally be expected, it is almost

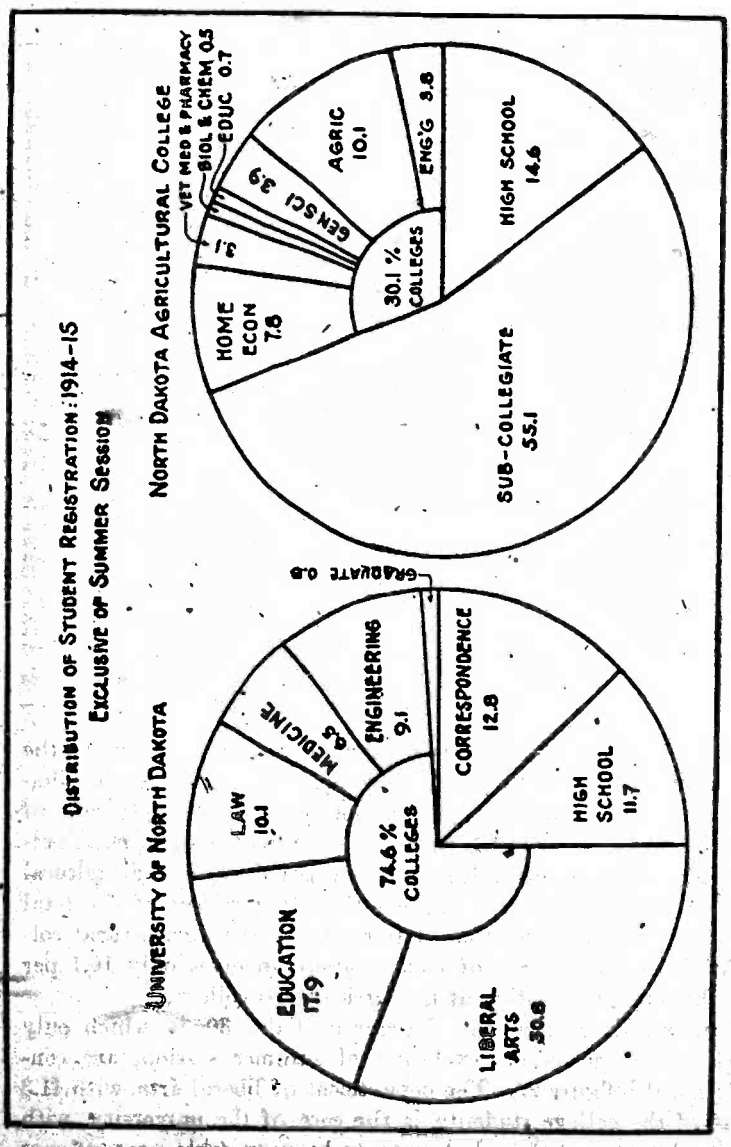

FIGURE 21.

Approximately three-fourths (74.6 per cent) of the students at the university are of college grade, as compared with less than one-third (30.1 per cent) at the agricultural college. Engineering constitutes less than 10 per cent of the work of the university and less than 4 per cent of that of the agricultural college.

equaled in importance by engineering, general science, education, and pharmacy, which, combined, register 33.3 per cent of the college students.

FIGURE 22.

A comparison of the student registrations of college grade only shows that 41.3 per cent of the university students are in liberal arts courses, and only 33.6 per cent of the agricultural college are in agricultural courses. Engineering occupies about the same relative space in the two institutions, 12.3 per cent and 12.7 per cent, respectively.

TABLE 29.—*Distribution of student registration, 1914–15, exclusive of summer session.*

Departments.	University of North Dakota.		North Dakota Agricultural College.	
	Number.	Per cent.	Number.	Per cent.
Graduate	7	0.8		
College	678	74.6	[illegible]	[illegible]
Subcollegiate			[illegible]	[illegible]
High school	[illegible]	[illegible]	[illegible]	[illegible]
Correspondence	[illegible]	[illegible]	[illegible]	[illegible]
Total	905	100.0	[illegible]	100.0

TABLE 30.—*Distribution of student registration of college grade, 1914–15, exclusive of summer session.*

Departments.	University of North Dakota.		North Dakota Agricultural College.	
	Number.	Per cent.	Number.	Per cent.
Agriculture	.....	.....	95	33.6
Biology	.....	.....	1	.3
Chemistry	.....	.....	4	1.4
Engineering	83	12.3	36	12.7
Education	162	24.0	7	2.3
Home economics	.....	.....	74	26.1
Law	92	13.6	.....	.....
Liberal arts, general science	279	41.3	37	13.0
Medicine	59	8.8	.....	.....
Pharmacy	.....	.....	15	5.3
Veterinary medicine and surgery	.....	.....	14	4.9
Total	675	100.0	283	100.0

The geographical distribution of resident students enrolled in the eight institutions, exclusive of summer session, for the school year 1914–15 is shown in Table 31. The distribution by counties in North Dakota is exhibited also in figure 28.

TABLE 31.—*Distribution of resident students, exclusive of summer school (except at Valley City), eight institutions, 1914–15.*

Source.	University.	Agricultural college.	Normal School, Valley City.	Normal School, Mayville.	Normal School, Minot.	Normal and Industrial School, Ellendale.	School of Science, Wahpeton.	School of Forestry, Bottineau.	Total, 8 institutions.
COUNTIES IN NORTH DAKOTA.									
Adams	1	2	9	.....	.....	.....	1	.....	13
Barnes	13	32	299	.....	.....	.....	.....	.....	344
Benson	8	24	21	11	4	.....	.....	.....	68
Billings	1	3	3	.....	.....	.....	.....	.....	7
Bottineau	9	17	15	9	11	.....	2	179	242
Bowman	.....	13	4	.....	.....	1	2	.....	20
Burke	5	.....	.....	.....	15	.....	.....	.....	20
Burleigh	5	12	26	.....	.....	7	.....	.....	50
Cass	16	224	49	6	.....	.....	7	.....	302
Cavalier	15	25	20	16	1	1	.....	.....	78
Dickey	2	8	13	.....	.....	211	.....	.....	235
Divide	4	1	6	.....	5	2	.....	.....	18
Dunn	2	2	1	.....	.....	.....	.....	.....	5
Eddy	3	8	18	.....	1	.....	1	.....	31
Emmons	2	3	10	5	.....	8	.....	.....	28
Foster	8	8	27	.....	.....	.....	3	.....	46
Golden Valley	1	4	3	.....	.....	.....	.....	.....	8
Grand Forks	194	26	4	29	1	.....	.....	.....	254
Griggs	3	10	13	.....	.....	.....	.....	.....	26
Hettinger	.....	1	7	.....	.....	.....	.....	.....	8
Kidder	.....	6	14	.....	.....	.....	2	.....	22
Lamoure	9	16	26	.....	.....	14	1	.....	66
Logan	1	1	2	.....	.....	5	.....	.....	9
McHenry	14	21	11	3	6	.....	.....	.....	55
McIntosh	.....	1	.....	.....	.....	3	.....	.....	4
McKenzie	1	7	1	1	2	.....	.....	1	13
McLean	.....	17	7	1	4	3	6	.....	38
Mercer	.....	1	3	.....	.....	2	.....	.....	6
Morton	8	19	46	.....	.....	2	.....	.....	75
Mountrail	1	4	2	1	5	.....	.....	.....	13
Nelson	19	24	4	16	.....	.....	.....	.....	63
Oliver	.....	2	5	.....	.....	3	.....	.....	10
Pembina	47	33	18	3	.....	1	.....	.....	102
Pierce	1	5	3	7	.....	.....	.....	.....	23

TABLE 31.—*Distribution of resident students, exclusive of summer school (except at Valley City), eight institutions, 1914–15*—Continued.

Sources.	University.	Agricultural college.	Normal School, Valley City.	Normal School, Mayville.	Normal School, Minot.	Normal and Industrial School, Ellendale.	School of Science, Wahpeton.	School of Forestry, Bottineau.	Total, 8 institutions.
COUNTIES IN NORTH DAKOTA—continued.									
Ramsey	26	41	17	13	1				98
Ransom	9	48	24	1		1	2		85
Renville	5	9		1	19		1	4	39
Richland	10	14	22	7			190		243
Rolette	7	6	3	16			3	3	38
Sargent	2	10	29	1		18	13		73
Sheridan		4	21			1			26
Sioux			1						1
Slope			2		1	1			4
Stark	9	10	8						27
Steele	4	10	14	26					54
Stutsman	9	29	59			4	1		102
Towner	6	17		7	1				31
Traill	26	27	4	162		1			220
Walsh	38	31	18	14	1		3		105
Ward	19	13	5	1	95				133
Wells	3	11	32		2				48
Williams	16	8	9		4				37
OTHER STATES.									
Idaho	1								1
Illinois	4	3	1						8
Indiana	1	5	3	1	1				11
Iowa	1	5	5	2		1	1		15
Kansas	2				1		1		4
Kentucky		1	2	1					4
Maryland		1							1
Massachusetts	1					1			2
Michigan	1		2				4		7
Minnesota	67	109	72	14	11	8	105	1	387
Missouri	1	1		1					3
Montana	6	14	12	1	3	2	4		42
Nebraska			1					1	2
New Hampshire	1								1
New York	3		1						4
Oklahoma	1	1							2
Oregon	2								2
Pennsylvania				1					1
South Dakota	2	17	2	2		23	11		57
Texas							1		1
Washington	1	2				1			4
Wisconsin	4	12	7	4	2	4	1	1	35
OTHER COUNTRIES.									
Canada	2	1	2	1	1	1	1		9
England		1							1
Hawaii	1								1
Japan						1			1
Norway		1					2		3
Scotland	1								1
Sweden	1						1		3
SUMMARY.									
Counties of North Dakota	583	662	958	357	183	288	238	187	3,456
Other States	99	171	108	27	18	40	128	3	394
Other countries	5	3	2	1	1	2	4		18
Total outside of North Dakota	104	174	110	28	19	42	132	3	612
Grand total	687	1,036	1,068	385	202	330	370	190	4,268

TABLE 32.—*Number of graduates of the eight institutions.*

School years.	University.	Agricultural college.	Normal School, Valley City.	Normal School, Mayville.	Normal School, Minot.	Normal and Industrial School, Ellendale.	School of Science, Wahpeton.	School of Forestry, Bottineau.	Total, 8 institutions.
1900–1901	34	7	11	15	.....	3	.....	.....	70
1901–2	28	4	18	22	.....	12	.....	.....	84
1902–3	52	2	38	21	.....	6	.....	.....	119
1903–4	62	7	33	26	.....	16	.....	.....	144
1904–5	55	5	48	33	.....	14	.....	.....	155
1905–6	62	8	60	54	.....	12	.....	.....	206
1906–7	86	5	88	49	.....	2	10	.....	239
1907–8	93	12	109	51	.....	22	19	.....	306
1908–9	88	19	145	56	.....	16	48	.....	372
1909–10	99	10	133	40	.....	32	44	5	363
1910–11	132	24	149	33	.....	35	43	4	420
1911–12	83	23	160	63	.....	47	50	6	431
1912–13	130	36	155	65	.....	33	57	1	477
1913–14	120	37	185	75	16	43	34	11	521
1914–15	133	23	216	63	35	52	40	9	581
From date of opening to 1899–1900	140	15	46	71	.....	.....	.....	.....	272
1900–1901 to 1909–10, inclusive	659	79	692	367	.....	135	121	5	2,052
1910–11 to 1914–15, inclusive	598	153	865	298	51	210	224	31	2,430
Total from date of opening to 1914–15, inclusive	1,397	247	1,603	736	51	345	345	36	4,760

Graduates.—The number of graduates annually since 1900–1901 is shown also (Table 32) so far as the figures are available.

There were 140 graduates from the university in the 16 years prior to 1900, 659 in the 10 years following, and 598 in the 5 years ending 1914–15; total, 1,397.

The agricultural college graduated 15 students during the first 10 years of its existence, 79 during the next 10 years, and 153 in the 5 years ending 1914–15; total, 247.

The Valley City Normal School graduated 46 students during its first 10 years, 692 during the next 10 years, and 865 during the 5 years ending 1914–15; total, 1,603.

The Mayville Normal School graduated 71 students during its first 10 years, 367 during the next 10 years, and 298 during the 5 years ending 1914–15; total, 736.

The Minot Normal School graduated 16 students the first year, and 35 the second; total, 51.

The number of graduates of the Ellendale school for the 10 years following 1900 is 135; for the 5 years ending 1914–15, 210; total, as reported, 345.

The total number of graduates from the School of Science at Wahpeton, as reported, is 345.

The School of Forestry at Bottineau has graduated 36 students in 6 years.

The total number of graduates of the 8 institutions, as reported, ranged from 70 in 1900–1901, and 420 in 1910–11, to 581 in 1914–15.

For the period preceding 1900, the graduates numbered 272; for the 10 years following, 2,058; for the 5 years ending 1914–15, 2,430; total, 4,760.

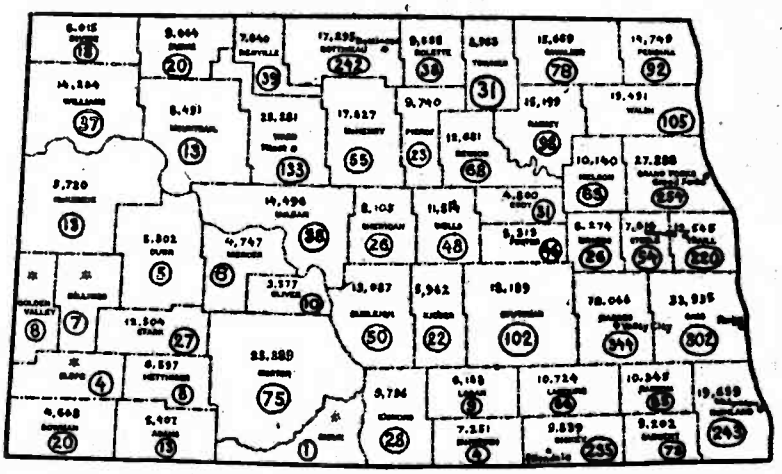

FIG. 23.—Distribution of resident students enrolled in 8 institutions in North Dakota, exclusive of summer session (except at Valley City, 1914–15). (See Table 31.)

The figures above the county name in each case give the population in 1910. At that date the population of Golden Valley County (later divided into Golden Valley, Billings, and Slope Counties) was 10,186; and the population of Morton County (later divided into Morton and Sioux Counties) was 25,289.

The figures inclosed in the circle in each case indicate the number of students from the county who are enrolled at the 8 institutions combined.

The 8 institutions drew 3,656 students from the 52 counties of North Dakota (of whom 53.9 per cent came from the 8 counties in which the institutions are located) and 612 from without the State; total, 4,268.

In 1910 the population of North Dakota was 577,056. Approximately 60 per cent (estimated 55 per cent in 1916) of the population were found in that portion of the State located east of the western boundary lines of the counties of Rolette, Pierce, Wells, Kidder, Logan, and McIntosh, which divide the State into two nearly equal parts, and 40 per cent were found in the portion west of this line; whereas, of the 3,656 North Dakota students in residence at the 8 institutions, approximately 76 per cent came from the territory east of the line indicated, and only about 24 per cent from west of this line.

A line drawn on the map from Grand Forks through Mayville, Valley City, and Ellendale to Wahpeton, together with the eastern boundary of the State, describes a territory which includes all of the educational institutions except those at Minot and Bottineau. The 10 counties included, with an aggregate of 7,506,560 acres, constitute 16.7 per cent of the area of the State, and with an aggregate population of 159,819 contain 27.7 per cent of the population of the State; on the other hand, these 10 counties furnish 1,876, or 51.3 per cent of all the students that North Dakota sends to the 8 institutions (3,656).

Outside of the 8 counties in which the institutions are located, only 13 counties are represented by more than 50 students per county at the 8 institutions combined.

Of the 52 counties, 22 have fewer than 30 students per county at the 8 institutions combined, and with an aggregate of 311 have fewer students in all of their own State institutions than the neighboring State of Minnesota, which is represented by 387 students in North Dakota.

Salaries.—The maximum salaries paid to members of the instructional staffs in the 8 institutions, exclusive of presidents, range from $1,500 at Bottineau to $3,700 at the agricultural college (Table 33).

The minimum salaries range from $100 at the university to $1,140 at Minot. The average salaries range from $991.66 at Bottineau to $1,870.54 at the agricultural college.

TABLE 33.—*Instructional staffs, eight institutions, 1914–15.*

	University.	Agricultural college.	Normal School, Valley City.	Normal School, Mayville.	Normal School, Minot.
1. Salaries of instructional staff, exclusive of president, 1914–15:					
a. Maximum salary paid	$3,200	$3,700	$2,500	$2,500	$2,000
b. Minimum salary paid	$100	$595	$585	$1,050	$1,140
c. Total amount paid for salaries	$126,437	$86,045	$64,920	$23,689.16	$20,757
d. Number of instructors reporting	70	47	48	14	15
e. Average salary	$1,806.24	$1,870.54	$1,360.00	$1,692.08	$1,383.13
2. Teaching activities of instructional staff, exclusive of president, 1914–15:					
a. Maximum number of class periods weekly	30	41	45	25	44
b. Minimum number of class periods weekly	3	5	16	5	10
c. Aggregate number of class periods weekly	1,269	1,092	1,279	245	424
d. Average number of class periods weekly	18.1	23.2	27.8	19.3	28.2
3. Education and professional preparation of members of instructional staff, exclusive of president, 1915–16:					
a. Number of instructors reporting	82	52	50	14	15
b. Number holding doctor's degree	23	7	2	.....	1
c. Number holding master's degree	36	13	11	3	2
d. Number holding bachelor's degree	78	40	26	13	11
e. Number reporting college work, but without degree	3	6	6	.....	2
f. Number of normal school graduates	16	7	31	5	9
g. Number reporting normal school work, but without graduating	4	5	6	7	2
h. Number reporting no education above high school	.....	3	.....	.....	1
4. Number of members of instructional staff, exclusive of president, who report giving public addresses, lectures, or recitals, Sept. 1, 1914, to Jan. 1, 1916	45	29	1	5	3
5. Aggregate number of addresses, lectures, and recitals reported	345	310	10	37	150

	Normal and Industrial School, Ellendale.	School of Science, Wahpeton.	School of Forestry, Bottineau.	Total, 8 institutions.
1. Salaries of instructional staff, exclusive of president, 1914–15:				
a. Maximum salary paid	$1,800	$1,800	$1,500	$3,700
b. Minimum salary paid	$300	$315	$675	$100
c. Total amount paid for salaries	$20,550	$22,500	$5,950	$370,848.16
d. Number of instructors reporting	19	19	6	238
e. Average salary	$1,061.58	$1,184.21	$991.66	$1,558.18
2. Teaching activities of instructional staff, exclusive of president, 1914–15:				
a. Maximum number of class periods weekly	45	40	45	45
b. Minimum number of class periods weekly	11	7	5	3
c. Aggregate number of class periods weekly	643	523	172	5,647
d. Average number of class periods weekly	33.8	27.5	28.6	23.7
3. Education and professional preparation of members of instructional staff, exclusive of president, 1915–16:				
a. Number of instructors reporting	21	19	7	260
b. Number holding doctor's degree	.....	.....	.....	33
c. Number holding master's degree	1	4	.....	70
d. Number holding bachelor's degree	13	9	4	194
e. Number reporting college work, but without degree	3	6	2	28
f. Number of normal school graduates	8	3	.....	79
g. Number reporting normal school work, but without graduating	4	2	2	32
h. Number reporting no education above high school	.....	2	.....	6
4. Number of members of instructional staff, exclusive of president, who report giving public addresses, lectures, or recitals, Sept. 1, 1914, to Jan. 1, 1916	13	2	5	103
5. Aggregate number of addresses, lectures, and recitals reported	130	5	32	1,014

Teaching activities.—The maximum numbers of class periods taught weekly per instructor range from 25 at Mayville to 45 at Valley City, Ellendale, and Bottineau (Table 33). The minimum numbers of class periods range from 3 at the university to 16 at Valley City. The average numbers of class periods range from 18.1 at the university to 33.8 at Ellendale.

Professional preparation.—The standards of scholarship maintained in the 8 faculties are not high, so far as evidence is to be found in higher degrees held (Table 33). Of 260 instructors, only 33 hold the doctor's degree, 70 hold the master's degree, and 194 hold the bachelors degree. Only 53 of the 100 instructors in the four normal schools are normal-school graduates. Six instructors, in three institutions, report having had no schooling above high school.

Public addresses.—More than half of the instructors at the university and agricultural college report giving public addresses, lectures, and recitals; whereas, of the 100 instructors in the 4 normal schools, only 22 have been active recently in this kind of work (Table 33).

Student attendance.—The student attendance for the year 1914–15 is shown by terms (Table 34). Combining the first semester attendance at the university with the winter term attendance at the other seven institutions, including the winter short course students at the agricultural college, the maximum aggregate enrollment for any one period is 3,357.

TABLE 34.—*Student attendance, by terms, eight institutions, 1914–15.*

Terms.	University.	Agricultural college.	Normal School, Valley City.	Normal School, Mayville.	Normal School, Minot.	Normal and Industrial School, Ellendale.	School of Science, Wahpeton.	School of Forestry, Bottineau.	Total, 8 institutions
First semester	759								759
Second semester	708								708
Fall term		606	557	202	201	143	153	102	1,974
Winter term		607	624	224	381	305	236	126	2,323
Spring te		312	542	191	201	220	155	46	1,667
Summer term	336	111	423	190	330	212	100	5	1,707
Special or short terms		276							276

High-school credits.—Of the 2,768 students reported as entering the eight institutions in 1914–15, fewer than one-third, 881, presented 15 or more high-school credits; of these, 214 entered the university, 98 entered the agricultural college, and 449 entered the four normal schools (Table 35). Of the 1,887 students presenting less than 15 high-school credits, 30 entered the university, 252 entered the agricultural college, and 1,168 entered the four normal schools. The fact that the normal schools receive such large numbers of students of this class, of whom 639 average but 16 years of age and 162

average 16.3 years of age, suggests that these institutions are undertaking a difficult task in attempting to give professional training to young people of insufficient maturity and inadequate previous preparation.

TABLE 85.—*Numbers and average ages of students presenting specified number of high-school credits at entrance, eight institutions, 1914–15.*

	University.	Agricultural college.	Normal School, Valley City.	Normal School, Mayville.	Normal School, Minot.	Normal and Industrial School, Ellendale.	School of Science, Wahpeton.	School of Forestry, Bottineau.	Total, 8 institutions.
Number of students presenting 15 or more high-school credits at entrance	214	98	324	46	39	40	107	13	881
Average age of students entering with 15 or more high-school credits, years	18.8	19.5	(1)	19.0	20.2	19.5	20.5	19.5	.....
Number of students presenting less than 15 high-school credits at entrance	30	252	376	339	162	291	263	174	1,887
Average age of students entering with less than 15 high-school credits, years	19.5	19.1	(1)	16.0	16.3	17.5	18.9	17.5	.....

[1] Not reported.

Permanent investment and maintenance costs.—The State of North Dakota has $2,150,730.02 invested in buildings and $749,076.31 invested in equipment in the eight institutions, averaging over $500 for each student enrolled during the school year 1914–15 (Table 36). The amounts invested in buildings at the university and agricultural college provide for other activities in addition to those directly involved in giving instruction to students, which necessarily bring up the average investment per student enrolled.

In the cases of the normal schools a relatively small enrollment at Mayville, and a new plant not yet utilized to capacity at Minot, explain in part the wide variation in investment in buildings per student enrolled. The amounts range from $217.44, at Valley City, to $708.56, at Minot. The amounts invested in equipment at the normal schools per student enrolled range from $9.98, at Mayville to $117.01, at Ellendale.

The amounts of total income of normal schools for 1914–15 per student enrolled range from $73.96, at Valley City, to $152.94, at Mayville.

TABLE 36.—*Investment in buildings and equipment and total income per student enrolled in 1914–15, eight institutions.*

	University.[1]	Agricultural College.[1]	Normal School, Valley City.	Normal School, Mayville.	Normal School, Minot.
Total investment to date in buildings	$508,597.05	$554,800.00	$353,350.00	$180,675.00	$255,712.00
Investment in buildings per student enrolled in 1914–15	409.82	473.78	217.44	447.21	708.56
Total investment to date in equipment, exclusive of grounds	272,069.54	315,730.00	59,504.67	4,032.95	27,337.00
Investment in equipment per student enrolled in 1914–15	219.23	269.62	36.61	9.98	75.56
Total income, school year 1914–15	400,743.55	429,382.45	120,192.96	61,779.86	54,533.36
Total income per student enrolled in 1914–15	322.91	366.59	73.96	152.94	145.42

	Normal and Industrial School, Ellendale.	School of Science, Wahpeton.	School of Forestry, Bottineau.	Total, 8 institutions.
Total investment to date in buildings	$126,575.97	$113,020.00	$58,000.00	$2,150,730.02
Investment in buildings per student enrolled in 1914–15	394.31	216.51	310.16	376.59
Total investment to date in equipment, exclusive of grounds	37,563.00	25,082.25	7,756.90	749,076.31
Investment in equipment per student enrolled in 1914–15	117.01	48.05	41.48	131.16
Total income, school year 1914–15	48,197.20	34,280.77	12,283.51	1,181,393.66
Total income per student enrolled in 1914–15	150.14	65.67	65.69	203.36

[1] Includes experiment stations and other noninstructional activities, since it was impossible to distinguish clearly in the accounts as reported.

The School of Science and the School of Forestry have approximately the same amounts invested in equipment per student enrolled, $48.05 and $41.48, respectively, and the same total income per student, $65.67 and $65.69, respectively. The investment in buildings per student enrolled in 1914–15 was $216.51 at the School of Science and $310,16 at the School of Forestry.

DISTRIBUTION OF GRADUATES BY OCCUPATION.

The graduates of the six institutions reporting are summarized in Table 37 according to their present occupations. It is very unfortunate that records have not been kept to show the present occupations of the 1,397 graduates of the university and the 736 graduates of the normal school at Mayville. These two groups together constitute 45.1 per cent of the total number of graduates of the eight institutions, 4,729.

TABLE 37.—*Distribution of graduates by occupation.*[1]

Occupation groups.	Agricultural College, Fargo.	Normal School, Valley City.	Normal School, Minot.	Normal and Industrial School, Ellendale.	School of Science, Wahpeton.	School of Forestry, Bottineau.	Total, six institutions.
1. Agricultural pursuits	66	.....	.....	8	47	3	124
a. Farming	34	.....	.....	8	47	3	92
b. Investigation, extension, and station work	32	.....	.....	.....	.....	.....	32
2. Professional pursuits	123	1,034	46	216	100	23	1,542
a. Teachers, school officers	79	964	41	126	50	6	1,266
b. Students	16	46	5	75	21	12	175
c. Engineering	18	.....	.....	6	11	.....	35
d. Lawyers, political officers	1	11	.....	5	9	2	28
e. Physicians, dentists, nurses	6	9	.....	3	3	3	24
f. Other professional service	3	4	.....	1	6	.....	14
3. Commercial pursuits	31	58	.....	31	137	7	264
a. In business	24	53	.....	26	36	7	146
b. Banking	2	5	.....	3	25	.....	35
c. Stenographers, bookkeepers, clerks	5	.....	.....	2	76	.....	83
4. Home makers, married (women)	20	381	3	79	53	2	538
5. Mechanics	.....	.....	.....	.....	3	.....	3
6. Deceased	9	.....	.....	7	.....	.....	16
7. Occupation not reported	.....	130	2	4	5	.....	141
8. Total	249	1,603	51	345	345	35	2,628

[1] Records of the present occupations of 1,397 graduates of the university, and of the 736 graduates of the normal school at Mayville, are not available.

Of the 2,628 graduates of the six institutions for whom information is available, only 249 are contributed by the agricultural college; and of these only 66 are reported as engaged in agricultural pursuits. So far as its graduates are concerned, therefore, the agricultural college is not the factor in the vocational life of the people of the State that it should be. Three normal schools contribute 1,999 graduates, of whom 1,131 are teaching and 126 are students. More than one-tenth of all the graduates reported, 264, are engaged in commercial pursuits, and more than one-fifth, 538, are home makers.

The graduates of the university for the years 1888–89 to 1914–15, inclusive, classified by departments, are distributed as follows:

	Graduates.	Per cent.
Professional schools	985	70.5
Law	311	22.2
Engineering	107	7.6
Education	513	36.6
Medicine	14	1.0
School for nurses	3	.9
Graduate school	37	2.6
College of liberal arts	412	29.5
Grand total	1,397	100.0

The graduates of the agricultural college for the years 1894–95 to 1914–15, inclusive, classified by departments, are distributed as follows:

	Graduates.	Per cent.
Agriculture	75	30.1
Engineering	38	15.3
Science	75	30.1
General science	61	24.5
Chemistry	8	3.2
Biology	3	1.2
Pharmaceutical chemistry	3	1.2
Home economics	57	22.9
Education	4	1.6
Total	249	100.0

In figure 24 the percentage distribution of the graduates, by occupation, is compared with the census distribution of gainful occupations in North Dakota, 1910. The graduates of the six institutions are distributed as follows: Agricultural pursuits, 4.7 per cent; professional, 59.4 per cent; commercial, 10.1 per cent; mechanical, 0.1 per cent; home making, 20.7 per cent; all others, 4.9 per cent. According to the 1910 census the percentage distribution of persons engaged in gainful occupations in North Dakota was as follows: Agricultural pursuits (including "agriculture, forestry, and animal husbandry"), 60.2 per cent; professional (including "professional service" and "public service not elsewhere classified"), 5.2 per cent; commercial (including "trade" and "clerical service"), 10.1 per cent; mechanical (including "manufacturing and mechanical industries" and "extraction of minerals") 10 per cent; home making, not enumerated; all others, 14.4 per cent.

The comparison emphasizes in a striking manner the fact that the State educational institutions in North Dakota are not adjusted to the vocational needs of the State, so far as the contributions made by the institutions are indicated in the occupations chosen by the graduates. Measured in these terms, North Dakota is spending approximately 60 per cent of her effort in State-supported educational institutions to prepare men and women for the *professions*, which represent only about 5 per cent of the vocational opportunities in the State, while devoting less than 5 per cent of her effort to preparation for *agricultural pursuits*, which represent 60 per cent of the occupations enumerated.

That this is a radical departure from the original policy which led to the founding of the institutions is apparent in the language used in the laws establishing them, and a study of the distribution of appropriations for the school year 1914–15 indicates that at the present time it is the evident intention of the State to give relatively less emphasis to preparation for the professions than actually is given. As shown in Table 38, 41 per cent of the cost of maintaining the eight institutions was definitely incurred for agricultural and

industrial education. It is to be noted that in this table the Normal and Industrial School at Ellendale is included in the normal school

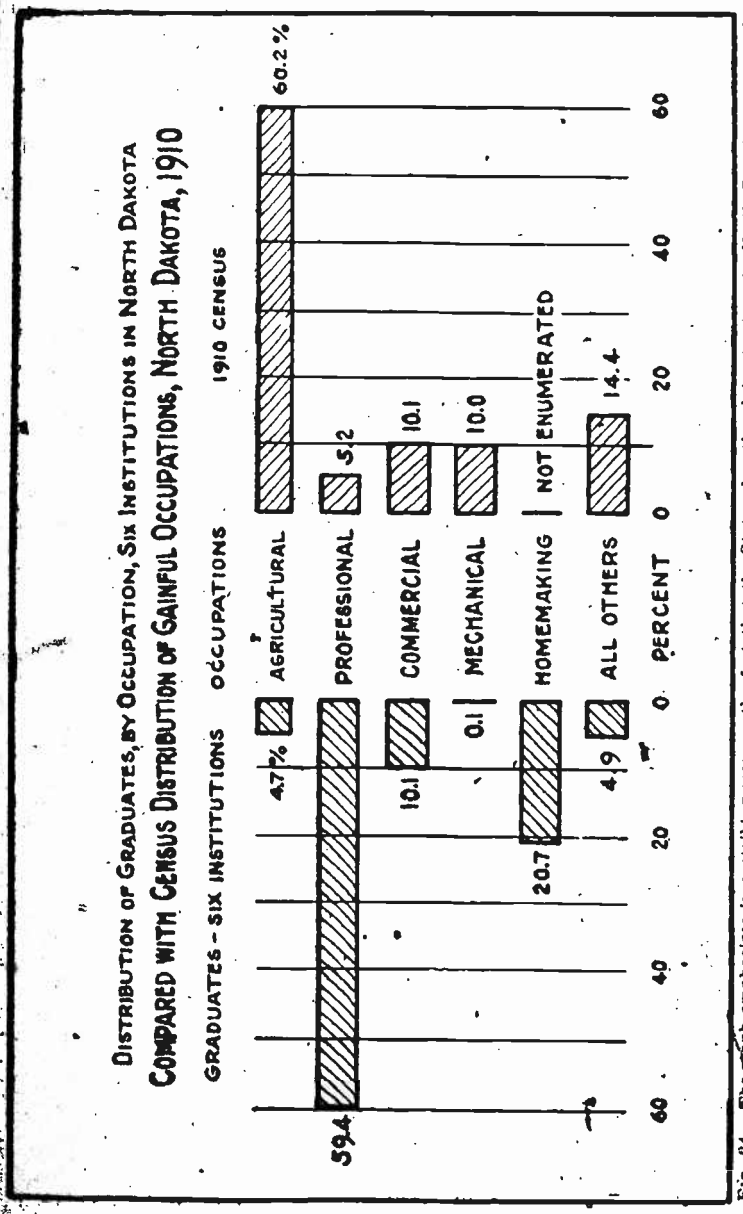

FIG. 24.—The graph emphasizes in a striking manner the fact that the State educational institutions in North Dakota are not adjusted to the vocational needs of the State, so far as the contributions made by the institutions are indicated in the occupations chosen by the graduates. Measured in these terms, North Dakota is spending approximately 60 per cent of her effort in State-supported educational institutions to prepare men and women for the *professions*, which represent only about 5 per cent of the vocational opportunities in the State, while devoting less than 5 per cent of her effort to preparation for *agricultural pursuits*, which represent 60 per cent of the occupations enumerated.

list, since the training of teachers appears to be its chief function at the present time, although it was originally established as an industrial school.

TABLE 38.—*Income of institutions for 1914–15.*

Institutions.	Amount.	Per cent.
University and normal schools:		
University	$400,743.55	
Valley City	120,192.96	
Mayville	61,779.86	
Minot	54,533.30	
Ellendale	48,197.20	
Total	685,446.86	59.0
Agricultural college and industrial schools:		
Agricultural college	429,382.45	
Wahpeton	34,280.77	
Bottineau	12,283.51	
Total	475,946.73	41.0
Grand total	1,161,393 66	100.0

It would be an error to conclude that the State institutions should prepare fewer persons for the professions. There is abundant evidence that the supply of trained teachers, especially, is entirely inadequate.

It would be an error also to assume that the facts presented are inconclusive with respect to the point here made, by reason of the omission of the records of 2,008 graduates of two institutions. If the present occupations of all the graduates of the university, including the graduates of the professional schools of law, medicine, engineering, and education, and of the graduates of the Mayville Normal School were known and added to the tabulation, it is reasonably certain that a far larger proportion of them would be classified under "professional pursuits" than under "agricultural pursuits." It can not be contended that in a distribution of the total number of graduates the "agricultural" group would probably constitute a materially greater percentage of the whole than is shown in figure 24, nor that the "professional" group would be much smaller proportionately than that indicated.

Further, it would be unfair to assume that the contribution made to agricultural education by the institutions in North Dakota is actually in proportion to the number of graduates who engage in agricultural pursuits, since many persons who are not graduates have received practical and helpful instruction in farming, and the agricultural interests of the State are benefited in many other ways than by the registration of students in agricultural courses.

After making due allowance for all of these considerations, however, the figures given emphasize the great need of agricultural education in North Dakota.

Some figures given in a recent study furnish additional evidence that the demand for higher education in North Dakota has not been

fully met.[1] According to this study there were 213 young persons from North Dakota enrolled as students in 27 of the leading colleges and universities outside the State during the academic year 1914–15, as follows: University of California, 3; Cincinnati, 1; Columbia, 18; Cornell, 5; Harvard, 3; Illinois, 15; Iowa State, 4; Johns Hopkins, 4; Michigan, 8; Minnesota, 60; Missouri, 2; Northwestern, 38; Ohio State, 2; Stanford, 2; Syracuse, 2; Tulane, 4; Virginia, 1; Western Reserve, 1; Wisconsin, 25; Yale, 3; Dartmouth, 1; Massachusetts Institute of Technology, 3; Purdue, 3; Williams, 2; Smith, 1; Vassar, 1; Wellesley, 1; total, 213.

SIZE OF CLASSES AT EIGHT INSTITUTIONS.

At the request of the survey commission the president of each institution prepared a detailed report on the number of students in attendance during the week of April 10–16, 1916. A summary of these reports is presented in Table 39.

TABLE 39.—*Data on size of classes for the week of April 10–16, 1916.*

Number of students attending.	Meetings of classes.								
	Total.	University.	Agricultural college.	Valley City.	Mayville.	Minot.	Ellendale.	Wahpeton.	Bottineau.
1	143	47	55	11	.....	.....	6	10	14
2	195	60	35	13	.....	.....	4	53	30
3	116	37	33	24	.....	.....	4	5	13
4	208	47	50	27	.....	5	22	36	21
5	139	34	29	18	5	5	11	25	12
6–9	553	162	93	89	11	20	79	79	20
10–14	537	122	68	101	44	36	93	66	7
15–19	414	86	41	138	56	29	47	12	5
20–29	588	148	35	203	89	28	61	19	5
30–39	187	50	10	39	38	44	1	.....	5
40–49	94	9	2	47	6	25	5	.....	.....
50 and over	39	14	3	11	.....	11	.....	.....	.....
Total	3,213	816	454	721	249	203	333	305	132

During the week in question there were in the eight State institutions, 143 meetings of classes at which only 1 student was in attendance, 195 meetings at which 2 students were present, 116 meetings at which 3 students were present, and 208 meetings at which 4 students were present; a total of 662 meetings of classes in the 8 institutions having less than 5 students in attendance. These 662 meetings of classes constitute slightly more than one-fifth, 20.6 per cent, of the entire number meeting during the week, 3,213.

That is, assuming an average cost per meeting of class, 20.6 per cent of the cost of instruction for the week was incurred for the maintenance of classes having less than 5 students each. Or, to put

[1] J. C. Burr: The Geographical Distribution of the Student Body at a Number of Universities and Colleges; *School and Society*, Nov. 6, 1915, pp. 676–688.

it in another way, of every dollar expended for instruction, 20.6 cents was expended for meetings of classes of 1 to 4 students each.

Considerable variation among the institutions in this respect is disclosed by the table, ranging from no meetings of less than 5 students at the State Normal School at Mayville, to more than one-half the entire number at the School of Forestry at Bottineau.

Combining the figures for meetings of classes of less than 10 students, an equally startling situation is disclosed. Of a total of 3,213 meetings of classes, 1,354 or 42.1 per cent, were attended by less than 10 students.

Table 40 presents a list of classes attended by not more than 5 students at any meeting of the class during the week in question.

TABLE 40.—*Meetings of classes attended by not more than five students during the week April 10–16, 1916.*

[This list does not include any class reporting an attendance of six or more students at any meeting of the class during the week.]

Subjects and catalogue numbers.	Number of sessions.	Number of students.
UNIVERSITY.		
Biology 6	1	3
Biology 24	1	1
Botany 16	5	1
Botany 8	4	4–5
Botany 20	1	1
Chemistry 18	2	2
Do	3	2
Graduate chemistry	4	1
Chemistry 14	2	3
Glass working	1	1
Economics 28	2	3
Economics 54	2	1
Labor problems	2	5
History of socialism	4	1
Economic theory	1	1
Education specials	1	2
Education 20	2	4
Do	2	3
English 20	1	3
English 24	4	1–5
English 32	2	5
English 6	2	4
English 10	2	3
English 30	2	2
Geology 10	2	4
Geology 8	3	2
Geology 22	1	5
German 15	3	3
Greek 2	4	5
Greek 4	4	4–5
Greek 10	2	4
History 7	2	5
History 18	2	3–4
Latin 2	4	4
Latin 6	3	3
Latin 8	1	4
Latin 10	4	4–5
Manual training II	5	4
Manual training III	5	2
Manual training advanced	2	2
Mathematics 8	2	1
Physics 6	2	2
Physics 12	4	1
Physics 14	1	1
Physics 16	3	3
French 6	3	2
Norse 100	1	1
Swedish 11, 12	2	1
UNIVERSITY—continued.		
Sociology 4	2	4
Sociology 14	4	3
Education 110	1	4
Education 112	1	4
Education	2	2
Education 108	2	3
Education 158	2	2
Education 152	2	4
Principles of nursing	2	3–4
Mechanical engineering 8 (4)	2	5
Mechanical engineering 10	5	1
Mechanical engineering X 34	1	5
Architectural drawing	2	2
Electrical engineering 2	4	2
Electrical engineering 14	3	1
Electrical engineering thesis	1	3
Mechanical engineering X 36 (2)	1	3
Mechanical engineering X 36 (1)	1	4
Mechanical engineering 32	1	1
Mechanical engineering X 44	1	5
Mechanical engineering 6	2	1
Machine shop 3	2	1
Machine shop 6	2	2
Machine shop 5	2	4
Industrial engineering chemistry	2	4
Graduate chemistry	4	1
Ceramics	2	4
Mining engineering 2	3	4
Do	2	3
Metallurgy 2	4	3–5
Ore treatment	5	2–5
Experimental testing	6	2
Industrial engineering chemistry 10	4	3
Industrial engineering chemistry 12	4	3
Analytical work	6	3
Ceramics 6 (a)	2	1
AGRICULTURAL COLLEGE.		
Thesis class (agronomy)	2	1
Dairying 5	2	1
Dairying 4	3	1
Dairying 6	3	4

TABLE 40.—*Meetings of classes attended, etc.*—Continued.

Subjects and catalogue numbers.	Number of sessions.	Number of students.
AGRICULTURAL COLLEGE—con.		
Animal husbandry 9	3	4–5
Agronomy 8	2	3
Agronomy 9	2	3
Agronomy 10	2	2–3
Thesis class (agronomy)	3	2
Botany 3	2	3
Botany 18	2	2
Botany 13	1	1
Botany 17 (1)	5	1
Botany 17 (2)	3	1
Bacteriology 13	3	4
Bacteriology 9	3	4
Bacteriology 10	2	3
Bacteriology 12	4	1
Bacteriology 11	4	5
Chemistry 13	3	3
Chemistry 8 (2)	3	4
Chemistry 24	5	1
Pharmacy 12	4	3–4
Education 14	1	3
English 15	4	3–5
Philosophy 8	4	3–4
English 21	4	4–5
Special work (English)	3	2–3
Mechanical engineering 38	2	2
Civil engineering 4	4	1
Civil engineering 4 (1)	2	1
Civil engineering 17	4	1
Civil engineering 19	4	1
Civil engineering 8	5	4
Mechanical engineering 15	3	3
Mechanical engineering 29	2	3
Mechanical engineering 23	2	4
Mechanical engineering 3	2	1
Mechanical engineering 28	3	2
Mechanical engineering 39	5	1
Mechanical engineering 9	2	5
Mechanical engineering 10	2	5
Mechanical engineering 7	5	3–5
Mechanical engineering 11	3	1
Mechanical engineering 14	1	1
Architecture 19	2	2
Architecture 15	2	1
Architecture 16	2	1
Architecture 6	2	2
Architecture 13	2	2
Architecture 18	5	1
Architecture 9	2	2
Domestic science 18	2	3
Mathematics 14	4	4
Mathematics 17	2	2
Mathematics 16	2	5
German 9	2	2–3
French 6	4	3–4
Public speaking 1	3	2
Public speaking 6	2	4
Public speaking 7	2	3
Veterinary science 13	5	4–5
Veterinary science 15	5	4
Harmony	3	4
Musical history	2	2
Gymnasium 5	2	3
Gymnasium 6	2	1
STATE NORMAL SCHOOL, VALLEY CITY.		
Psychology 51a	5	5
Singing method	3	4
Writing	3	5
Commercial law	2	3–4
Mathematics 21	4	1
Latin 23	5	3
Latin 33	5	2
German 33	5	4
English expression	4	4–5
Expression	2	1–2
Stenography 33	5	4
Typewriting and transcribing 2	5	5
Manual training methods	5	2

Subjects and catalogue numbers.	Number of sessions.	Number of students.
STATE NORMAL SCHOOL, VALLEY CITY—continued.		
Mechanical drawing 1	5	3
Mechanical drawing 2	5	3
Copperwork	5	1
Shopwork	5	4
Physical education methods	2	2
Methods of coaching	3	3
Hygiene and sanitation	5	4
Apparatus work (gymnasium)	2	2
STATE NORMAL SCHOOL, MAYVILLE.		
General English literature	5	5
STATE NORMAL SCHOOL, MINOT.		
Household management	5	4
School administration	5	5
STATE NORMAL AND INDUSTRIAL SCHOOL, ELLENDALE.		
Civics	5	4
Latin I	5	1
Latin III	5	1–2
Qualitative chemistry	2	4–5
Trigonometry, surveying	5	4
Preparatory English	5	4
Preparatory arithmetic	5	5
Preparatory history	5	3–4
STATE SCHOOL OF SCIENCE, WAHPETON.		
College algebra	5	5
Physics I	5	3–4
Mechanism	5	2
Botany	5	5
German b	5	2
German I	5	2
German II	5	4
Latin a	5	2
Telephony	5	2–3
Wireless telegraphy	5	2
Machine shop	2	4
Wood shop	2	4
Dietetics	5	1
Textiles	5	1
Home nursing 2	5	2
Food study	5	4
Plain sewing 1	6	2
Plain sewing 2	5	5
Dressmaking	2	5
Senior cooking	3	4
Millinery	5	5
Shorthand 1		4
Shorthand 2	5	2
Shorthand 3	5	2
Typewriting 1	5	4
Typewriting 2	5	2
Typewriting 6	5	4
STATE SCHOOL OF FORESTRY, BOTTINEAU.		
Sewing 1	5	3–4
Cookery 1	5	4
Shorthand I 1	5	4
Shorthand II 1	5	2
Typewriting II	5	5
Mechanical drawing	5	6
English I	5	1–2
English II	5	1–2
Advanced chemistry	5	2
College English	5	2–4
Expression	5	2–3
United States history	4	2
Ancient history	4	1
Poultry	5	1
Elementary woodwork	2	4
Wireless telegraphy	5	8
Music	5	1–5
Physiology	4	3–4

ATTENDANCE.

Table 41 presents a summary of the reports on students attendance for the week of April 10–16, 1916. The total number of students reported as being in attendance upon one or more classes during the week is 2,259. The sum of the numbers of students attending all classes for the week is 46,617, an average of 20.6 times present per student. Only two institutions fall below this average, the university and the School of Forestry. Concerning the university, it may be noted that an average of nearly 16 meetings of classes per student per week accords with the conditions prevailing in college and university work. The low average per student for the School of Forestry, 7.7 classes per week, has been explained elsewhere (see p. 114).

TABLE 41.—*Data on attendance for the week of Apr. 10–16, 1916.*

	Total.	University.[1]	Agricultural college.[1]	Valley City.[2]	Mayville.[2]	Minot.[2]	Ellendale.	Wahpeton.	Bottineau.
Number of students reported	2,259	706	203	539	204	206	190	106	105
Aggregate number times present	46,617	11,174	4,187	13,542	5,339	4,958	4,249	2,351	817
Average number times present per student	20.6	15.8	20.6	25.1	26.1	24.0	22.3	22.1	7.7
Aggregate number meetings of classes	3,213	816	454	721	249	203	333	305	132
Average student attendance per class	14.5	13.7	9.2	18.8	21.4	24.4	12.7	7.7	6.1

[1] Exclusive of students in model high school.
[2] Exclusive of students in agricultural and manual training high school.
[3] Exclusive of children in training school.

By dividing the number representing the aggregate number of times present during the week by the number of meetings of classes, an average number of students in attendance per class is obtained, 14.5. Two institutions fall very much below this average, the School of Science and the School of Forestry. The figures in Table 41, taken in conjunction with those in Table 42, suggest the desirability of further investigation to determine the justification for the continuance of small classes.

The figures for two institutions, on the other hand, show averages considerably in excess of the general average, the Normal Schools at Mayville and Minot. One fact partially explaining the high average of the Normal School at Minot does not appear in the summary; namely, in a considerable proportion of cases (approximately 40 per cent of the entire number of classes) students of high-school grade are admitted to the same classes in which graduates of accredited high schools are receiving instruction. This practice serves to

keep down the number of separate courses and classes, and is perhaps not objectionable in certain subjects. Careful inquiry should be made

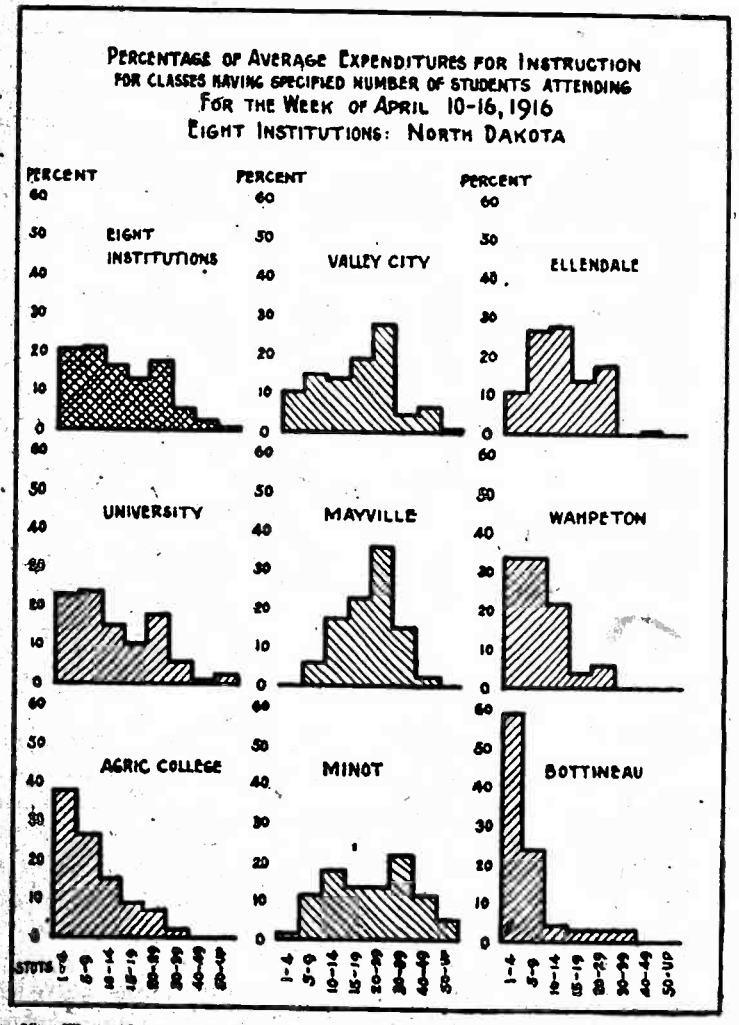

FIG. 25.—The wide range in the proportion of students taught in classes of one to four may be noted by comparing the height of the first left-hand rectangles in the distributions for Minot and Bottineau, respectively. Compare also the "20–29 students" rectangles at Mayville and Bottineau, respectively.

here to determine the point beyond which economy in this respect is detrimental to the interests of the real work of the normal school.

The facts set forth in Tables 39, 40, and 41 are reduced to a cost basis in Table 42, and presented in graphic form in figures 25 and 26.

TABLE 42.—*Relative cost of instruction for the week of Apr. 10–16, 1916.*

Number of students attending.	Of each dollar expended for instruction, the amount expended on classes having specified number of students.								
	Average.	University.	Agricultural college.	Valley City.	Mayville.	Minot.	Ellendale.	Wahpeton.	Bottineau.
1 to 4	$0.206	$0.234	$0.381	$0.104	.....	$0.024	$0.108	$0.341	$0.591
5 to 9	.215	.240	.267	.148	$0.084	.123	.270	.341	.242
10 to 14	.167	.149	.149	.140	.176	.177	.279	.216	.063
15 to 19	.128	.105	.090	.191	.224	.142	.141	.039	.037
20 to 29	.183	.181	.077	.281	.361	.138	.183	.062	.037
30 to 39	.058	.061	.022	.054	.152	.216	.003	.....	.037
40 to 49	.029	.011	.004	.065	.024	.123	.015	.....	.....
50 and over	.012	.017	.006	.015	.....	.054	.....	.....	.....

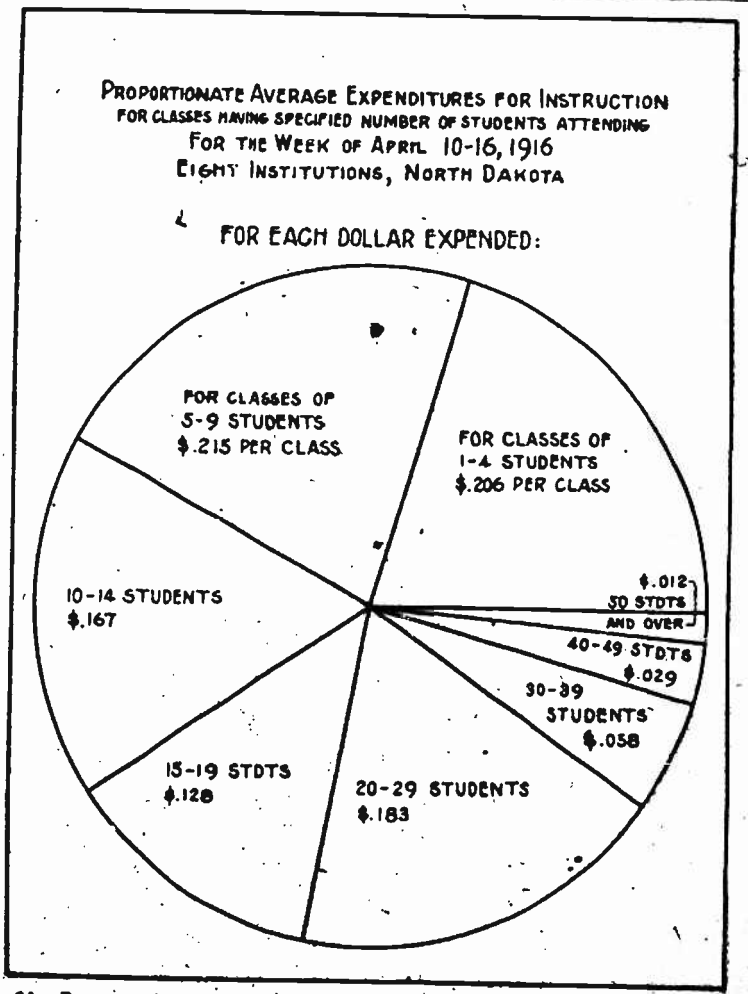

FIG. 26.—Because of the excessive number of small classes, nearly half of the cost of instruction is absorbed by classes having fewer than 10 students—$42.10 out of each $100.

Hasty conclusions should not be drawn from these figures (Table 42). The information available does not warrant arbitrary recommendations concerning the abolition of any or all of these small classes. The maintenance of a small class is a matter of internal administration, and frequently of expediency, and the decision should be reached only after careful examination of the facts in each case.

It seems evident, however, that there are in the eight institutions a number of courses the demand for which is not sufficient to justify their maintenance. The presidents of the institutions should be requested to scrutinize these lists with the greatest care for the purpose of eliminating all courses for which clear cases of necessity or expediency can not be made out.

If many courses essentially the same are given in two or more institutions with very small numbers taking them, it becomes desirable to consider carefully the relative need for such courses and the advisability of eliminating them from some of the institutions in the interest of economy to the end that the State may receive the largest possible service from its institutions. This is a matter for the cooperation of the board of regents and the administrative officers of the institutions concerned.

Chapter XI.

DUPLICATION OF COURSES AND CLASSES AT THE UNIVERSITY AND THE AGRICULTURAL COLLEGE.

In Table 43 is presented a list of the classes, arranged by departments, at the university and the agricultural college which held meetings during the week of April 10–16, 1916. At this time comparatively few irregular and short-course students were present at any of the institutions, but it is assumed that at all the institutions a very large majority of the students who attended through the year were present. The various courses are arranged in parallel columns to show to what extent there is duplication of work at the two institutions. Were all the courses outlined in the catalogues of the two institutions included, the table would be still more instructive; but so many of those offered had no students taking them that it is thought best to omit them from the table.[1] As noted elsewhere, the amount of objectionable duplication of work does not constitute a serious problem at the present time; it is not nearly so serious as that of the maintenance of a large number of very small classes. Some of these small classes, especially in the higher courses, are necessary and are not to be considered objectionable; but it is believed that, in the interest of efficiency, economy, and the best service of the State, this table should be studied very carefully both by the board of regents and by the executive officers and faculties of the institutions. The future of the two institutions must depend on a clear definition of their respective fields of effort, and a complete mutual understanding of their major aims and purposes.

If the recommendations made in this report for the avoidance of duplication at the university and the agricultural college had been made in April, 1916, only 11 classes and 30 students at the college would have been affected, counting the total number of attendants in all these classes and counting two or more times all such students as were enrolled in more than one of these classes.[2] Of these 30 students, 25 were in 7 junior classes and 5 in 4 senior classes. The commission is not sure that the courses designated as M. E. 15 and M. E. 29 might not be included under industrial engineering, as defined in this report. If they should be so included, then the total number of classes affected would have been only 9 and the total of class attendants only 24. No students of the university would have been affected.

[1] See Tables 55 and 56, Appendix XI.

[2] See Table 44.

TABLE 43.—*Meetings of classes held during the week*

University.					
Course number.	Subject.	Rank of instructor.	Meetings.	Students attending.
AGRICULTURE.				
ART AND DESIGN.				
Art and design 2	Art and design	Instructor and assistant.	5	16, 17, 16, 16, 17
4	do	Assistant	5	10, 10, 10, 10, 10
6	do	Instructor	3	9, 9, 9
8	do	do	2	9, 9
10	Art for teachers	do	3	11, 11, 11
12	Applied art	do	1	16
14	History of painting	do	2	11, 11
16	Appreciation of pictures	do	1	12
BIOLOGY.				
Biology 2	Evolution and heredity	Professor	2	16, 16
6	Biological seminar	do	1	3
22	Vertebrate comparative anatomy	do	5	22, 21, 24, 22, 23
24	Research	do	1	1
Botany 8	Elementary plant physiology	Assistant professor	4	5, 5, 5, 4
10	General botany	do	4	6, 6, 7, 7
16	Plant physiology	do	5	1, 1, 1, 1, 1
20	Research	do	1	1
CHEMISTRY.				
Chemistry 2	General chemistry, lecture	Professor	3	54, 111, 53
2	General chemistry	Assistant professor	4	24, 26, 23, 24
2 (1)	do	Instructor	4	14, 15, 14, 16
2 (2)	do	do	4	20, 23, 20, 21
2 (3)	do	do	4	17, 21, 21, 21
2	do	do	2	18, 18
2 (e)	General chemistry, for engineering students.	Assistant professor	4	13, 14, 14, 14
4 (1)	Quantitative analysis	do	4	11, 13, 13, 13
4 (2)	do	do	4	5, 4, 6, 6
6	Chemistry of foods	Professor	2	21, 21
6	do	Instructor	8	21, 12, 8
8	Organic chemistry	do	3	18, 19, 8
16	Individual research, recitation	Professor	1	6
16	Individual research, laboratory	do	3	6, 2, 2
14	Photo-chemistry	Assistant professor	2	3, 3
16	Recitation	Professor	2	2, 2
18	do	do	3	2, 2, 2
	Chemistry seminar	do	1	9
	Graduate course	do	4	1, 1, 1, 1
	Glass working	Instructor	1	1
	Industrial engineering chemistry for mining engineering students.	Professor	2	4, 4

of April 10–16, 1916—University and agricultural work.

Agricultural College.					
Course number.	Subject.	Rank of instructor.	Meetings.	Students attending.	Year of course.
AGRICULTURE.					
Horticulture. 2	Plant propagation	Professor	4	26, 26, 26, 26	Freshman.
6	Horticultural elective	....do	3	5, 5, 5	
10	Forestry	....do	2	7, 7	
Agronomy... 1	Farm crops	....do	2	18, 18	Do.
2	Crops laboratory	....do	1	18	Do.
	Thesis class	....do	2	2, 2	Senior.
Dairy..... 5	Ice cream	....do	2	4, 4	Junior.
6	Cheese making	....do	2	4, 4	Do.
8	City market milk supplies	....do	3	4, 4, 4	Senior.
Anim. husb. 3	Breeds of live stock	....do	5	27, 27, 26, 27, 27	Freshman.
4	Judging live stock	....do	2	24, 22	Do.
8	Care and management	....do	3	9, 11, 11	Junior.
9	Care and management, practice work.	....do	3	6, 6, 6	Do.
9	....do	....do	3	5, 5, 4	Do.
10	Herd-book study	....do	2	6, 6	Do.
Agronomy.. 7	Soil physics and management	Assistant professor	3	18, 18, 19	Soph.
8	Soil management laboratory	....do	2	3, 3	Do.
8	....do	....do	1	15	Do.
9	Soil fertility	....do	2	3, 3	Junior.
10	Soil fertility laboratory	....do	2	2, 3	Do.
	Thesis class	....do	3	2, 2, 2	Senior.
ARCHITECTURE.					
Architecture. 6	Design	Instructor	2	2, 2	Soph.
9	Free-hand drawing	....do	2	2, 2	Do.
15	....do	....do	2	1, 1	Junior.
16	Water color	....do	2	1, 1	Do.
18	Design	....do	5	1, 1, 1, 1, 1	Do.
13	History of architecture	....do	2	2, 2	Soph.
19	History of sculpture and painting.	....do	2	2, 2	Junior.
BIOLOGY.					
Botany..... 3	General introductory botany	Associate professor	3	22, 22, 22	Freshman.
3	....do	....do	2	3, 3	Do.
13	Plant physiology and pathology.	....do	1	1	Senior.
17	Advanced botany and investigation.	....do	5	1, 1, 1, 1, 1	Do.
17	....do	....do	3	1, 1, 1	Do.
18	Elementary pharmaceutical botany.	....do	3	7, 7, 7	Soph.
18	....do	....do	2	2, 2	Do.
20	Botany for home economics students.	....do	4	14, 14, 15, 15	Freshman.
Zoology..... 3	Zoological foundations	Professor	3	6, 19, 19	Do.
8	Animal parasites	....do	5	6, 6, 6, 6, 6	Soph.
12	Human physiology	....do	3	16, 16, 16	Junior.
CHEMISTRY.					
Chemistry. 3(2)	Inorganic chemistry	Professor	3	9, 9, 9	Freshman.
3 (2)	....do	....do	2	40, 40	Do.
4 (2)	Qualitative chemistry	....do	3	14, 14, 14	Do.
4 (2)	....do	....do	3	39, 39, 39	Do.
8 (2)	Elementary quantitative chemistry.	....do	3	4, 4, 4	Soph.
9 (2)	Organic chemistry	....do	3	17, 17, 17	Do.
10 (2)	Organic preparations	....do	2	15, 13	Do.
13	Elementary physical chemistry.	....do	3	3, 3, 3	Junior.
21	Industrial chemistry for engineering students.	....do	4	6, 6, 6, 6	Soph.
24	Organic industrial chemistry	....do	5	1, 1, 1, 1, 1	Senior.
33	Elementary physiological chemistry for home economics students.	....do	3	39, 38, 36	Soph.
28	Inorganic constituents for home economics students.	....do	3	20, 20, 20	Freshman.
7 (3)	General chemistry for students in veterinary science.	....do	5	7, 8, 8, 8, 8	Do.
27	Toxicology and urinology	....do	5	6, 7, 7, 7, 7	Senior.

TABLE 43.—*Meetings of classes held during the week of April*

University.				
Course number.	Subject.	Rank of Instructor.	Meetings.	Students attending.
CHEMISTRY—Con.				
Chemistry.....10	Industrial engineering chemistry..	Instructor	4	4, 4, 4, 4.....
12	.....do.....	.....do.....	4	2, 2, 2, 2.....
	Analytical work.....	.....do.....	6	2, 2, 2, 2, 2, 2.....
EDUCATION.				
	Theory and practice of teaching—			
Education.....102	English in high schools.....	Instructor.....	2	7, 7.....
110	German.....	.....do.....	1	4.....
112	Latin.....	.....do.....	1	4.....
	History.....	.....do.....	2	2, 2.....
108	Mathematics.....	.....do.....	2	3, 3.....
156	Chemistry.....	Professor.....	1	9.....
158	Stenography.....	Instructor.....	2	2, 2.....
152	Manual training.....	.....do.....	2	4, 4.....
162	Music.....	Associate professor	2	5, 8.....
	Philosophy of education.....	Professor.....	2	25, 25.....
2a	Child study.....	.....do.....	4	53, 52, 56, 53.....
10	History of education.....	.....do.....	4	8, 8, 8, 8.....
16	Educational classics.....	.....do.....	2	6, 8.....
18	Secondary education.....	.....do.....	2	16, 17.....
	Special course.....	.....do.....	1	2.....
	History of education.....	Assistant professor	4	21, 20, 20, 21.....
4	Special methods in the elementary school.	Professor.....	4	62, 65, 65, 65.....
8	School supervision and administration.	.....do.....	3	10, 10, 10.....
20	School administration seminary.....	.....do.....	2	4, 4.....
20	School in absentia.....	.....do.....	2	3, 3.....
ENGINEERING.				
CIVIL ENGINEERING.				
Surveying.....2	Elementary surveying.....	Professor.....	2	10, 10.....
2	.....do.....	.....do.....	2	9, 9.....
4	Surveying.....	.....do.....	3	10, 10, 10.....
8	Topography.....	.....do.....	2	6, 6.....
8	.....do.....	.....do.....	2	8, 8.....
12	Mining surveying.....	.....do.....	2	4, 4.....
	Reinforced concrete.....	.....do.....	4	7, 7, 7, 7.....
	Structural design.....	.....do.....	4	8, 8, 8, 8.....
M. E. X.....44	Hydraulic laboratory.....	.....do.....	1	5.....
X.....44	.....do.....	Instructor.....	1	5.....
ELECTRICAL ENGINEERING.				
M. E. X.....42	Dynamo laboratory.....	Professor.....	1	6.....
X.....42	.....do.....	Assistant professor	1	6.....
E. E.....2	Direct current machinery.....	.....do.....	4	2, 2, 2, 2.....
8	Electrical design.....	.....do.....	4	6, 6, 6, 6.....
10	Electrical engineering.....	.....do.....	4	6, 6, 6, 6.....
14	Electrical machinery.....	.....do.....	3	1, 1, 1.....
	Thesis in electrical engineering.....	.....do.....	1	3.....
ENGINEERING DRAWING.				
	Architectural drawing.....	Professor.....	2	2, 2.....
M. E.....2	Mechanical drawing.....	Assistant professor	3	6, 6, 6.....
2	.....do.....	.....do.....	3	9, 9, 9.....
4	Mechanical drawing, civil engineering students.	.....do.....	2	8, 8.....
4	Mechanical drawing, mechanical and electrical engineering students.	.....do.....	2	11, 11.....
M. E.....4	Machine design.....	Instructor.....	2	12, 12.....
6	.....do.....	.....do.....	1	1.....
6	.....do.....	.....do.....	1	1.....
10	.....do.....	Professor.....	5	1, 1, 1, 1, 1.....
Min. E.....2	Mining engineering drawing.....	Assistant professor	2	2, 2.....

10–16, 1916—University and agricultural college—Continued.

Agricultural College.					
Course number.	Subject.	Rank of Instructor.	Meetings.	Students attending.	Year of course.
EDUCATION.					
Education...4	Principles of teaching	Instructor	4	23, 24, 24, 25	Senior.
5	Agricultural and industrial education.	do	3	17, 17, 17	Junior.
9	School law	do	2	16, 18	Do.
14	Current educational literature	do	1	3	
ENGINEERING.					
CIVIL ENGINEERING.					
C. E.... 1 (1)	Surveying for agricultural students.	Instructor	2	14, 14	Soph.
4	Roads and pavements	do	4	1, 1, 1, 1	Junior.
4 (1)	Roads	do	2	1, 1	Do.
15	Concrete and drainage for agricultural students.	do	4	7, 7, 8, 8	Senior.
17	Water purification, sewage disposal, sanitation.	do	4	1, 1, 1, 1	Do.
8	Hydraulics	Assistant professor	5	4, 4, 4, 4, 4	Junior.
19	Bridge design	Professor	4	1, 1, 1, 1	Senior.
ELECTRICAL ENGINEERING.					
ENGINEERING DRAWING.					
M. E.....7	Mechanical drawing	Instructor	5	3, 3, 3, 5, 5	Freshman.
11	do	do	3	1, 1, 2	Soph.
9	Descriptive geometry	do	2	5, 5	Freshman.
10	Mechanical perspective	do	2	5, 5	Do.
38	Machine design	Professor	2	2, 2	Senior.

TABLE 43.—*Meetings of classes held during the week of April*

University.

Course number.	Subject.	Rank of instructor.	Meetings.	Students attending.
MECHANICAL ENGINEERING.				
M. E.....8 (2)	Thermodynamics	Professor	4	6,6,6,6
8 (4)	Power-plant problems	....do	2	5,5
12	Design of pumping plants	....do	4	6,6,6,6
62	Mechanics of engineering	....do	5	11,11,11,11,11
X.....36 (2)	Mechanical laboratory	Instructor	1	2
X.....36 (1)	....do	....do	1	4
32	....do	....do	1	1
MINING ENGINEERING				
	Building materials	Professor	4	7,7,7,7
	Ceramics	....do	2	4,4
Min. E.....2	Lecture	Assistant professor	3	4,4,4
Metall.....2	Metallurgy lecture	....do	2	7,7
2	Metallurgy laboratory	....do	4	2,2,5,5
	Ore treatment, lecture	....do	1	3
	Ore treatment, laboratory and mill	....do	4	3,3,2,3
	Graduate course	Professor	4	1,1,1,1
SHOP PRACTICE.				
4	Pattern-making	Instructor	2	9,9
2A	Forge-shop	....do	3	10,10,10
2B	....do	....do	3	10,10,10
5	Machine-shop	....do	2	4,4
6	....do	....do	2	2,2
8	....do	....do	2	1,1
HOME ECONOMICS.				
	Textiles and needlework	Assistant	4	16,16,16,16
	....do	....do	4	18,18,18,18
	Food and cooking	Instructor	4	15,16,14,16
	....do	....do	4	10,10,10,9
	Nutrition	....do	2	10,10
	Methods	....do	1	20
	Nutrition	Assistant	1	10
LANGUAGE.				
English.....2	Advanced rhetoric	Professor	5	27,24,27,27,22
2	....do	Associate professor	5	22,22,21,22,21
2	....do	Assistant professor	5	29,30,28,29,29
2	....do	....do	5	35,35,35,35,35
2	....do	Instructor	5	46,48,43,45,44
2	....do	....do	5	16,16,16,16,16
2	....do	Assistant	5	26,26,26,26,26
2	....do	....do	4	22,21,21,22
4	Public address	Assistant professor	4	13,13,13,13
4a	Public speaking, for law students	....do	2	13,13
6	Journalism	....do	2	4,4
8	English composition, for engineering students.	Instructor	4	14,14,14,13
10	The short story	....do	2	3,3
12		Professor	3	6,6,6
14	Shakespeare	Associate professor	5	24,24,22,24,24
16	English poets of the nineteenth century.	Professor	5	25,26,25,25,25
20	English seminar	....do	1	3
24	Modern drama	Associate professor	4	5,5,4,1
22	Interpretive reading	Assistant professor	2	22,22
30	The English novel	Instructor	2	2,2
33	Technic of the drama	Associate professor	2	5,6

10-16, 1916—University and agricultural college—Continued.

Agriculture College.					
Course number.	Subject.	Rank of instructor.	Meetings.	Students attending.	Year of course.
MECHANICAL ENGINEERING.					
M. E..... 15	Internal combustion engines	Assistant professor	3	3, 3, 3	Junior.
39	Heat engines	do	5	1, 1, 1, 1, 1	Senior.
28	Mechanism	do	3	2, 2, 2	Soph.
29	Mechanics of materials	do	2	3, 3	Junior.
23	Materials testing laboratory	do	2	4, 4	Do.
32	Materials of construction	do	4	6, 6, 6, 6	Do.
MINING ENGINEERING.					
SHOP PRACTICE.					
M. E..... 2	Forge shop	Instructor	3	6, 6, 6	Freshman.
3	Machine shop	Assistant professor	2	1, 1	Soph.
11	Molding	Instructor	1	1	Do.
HOME ECONOMICS.					
Dom. Art... 3	Undergarment making	Instructor	2	12, 10	Freshman.
4	Domestic art	do	2	12, 12	Soph.
8	Millinery	do	2	12, 14	Junior.
10	Teaching domestic art	do	2	8, 8	Do.
11	Advanced dressmaking	do	2	11, 11	Senior.
Dom. Sci.... 1	Food preparation	do	3	6, 6, 6	Soph.
8	Economic uses of food	do	5	19, 19, 19, 19, 19	Junior.
15	Teaching domestic science	do	2	13, 13	Do.
16	Theory and practice of teaching	do	2	6, 6	Senior.
18	Social observances	do	2	3, 3	Junior.
20	Home nursing	do	3	15, 14, 13	Senior.
21	Institutional management	do	2	24, 24	Do.
21	.....do	do	1	12	Do.
21	.....do	do	1	12	Do.
LANGUAGE.					
English..... 8	Argumentation	Professor	4	11, 11, 11, 11	Freshman.
9	History of English literature	Assistant professor	4	11, 11, 10, 11	Do.
15	Essays	Professor	4	4, 3, 5, 5	
21	Playwriting	Assistant professor	4	4, 5, 5, 5	
Pub. Spk... 1	Elementary public speaking	Professor	5	12, 14, 12, 14, 12	
1	.....do	do	3	2, 2, 2	
6	Community programs	do	2	4, 4	
7	Dramatics	do	3	3, 3, 3	
	Special work	Assistant professor	3	2, 2, 3	

TABLE 43.—*Meetings of classes held during the week of April*

University.				
Course number.	Subject.	Rank of instructor.	Meetings.	Students attending.
LANGUAGE—Continued.				
German	Beginning course in German	Professor	4	24, 25, 23, 23
2	do	Assistant professor	4	17, 18, 18, 18
4	Reading, syntax, composition	Professor	4	36, 37, 35, 36
4	do	Assistant professor	4	27, 29, 31, 31
4b	Intermediate course	do	4	17, 17, 17, 17
6	Advanced reading course	do	4	24, 24, 24, 24
10	Scientific German	Professor	4	26, 23, 26, 25
14	Goethe	do	3	7, 7, 7
15	Lessing	do	3	3, 3, 3
Greek	2 Introductory course	Professor	4	5, 5, 5, 5
4	Attic prose and epic poetry	do	4	5, 5, 4, 5
8	Greek literature in English translation.	do	4	12, 12, 12, 10
10	Greek archeology	do	2	4, 4
11	Greek mythology	do	2	12, 13
	Greek literature for teachers	do	2	10, 10
Latin	2 Cicero	Assistant professor	4	4, 4, 4, 4
4	Virgil's Aeneid	do	4	6, 6, 6, 6
6	Horace: Odes	do	3	3, 3, 3
8	Latin prose composition	do	1	4
10	Livy	do	4	5, 5, 4, 5
French	2 Intermediate French	Professor	4	18, 17, 19, 19
4	Modern French poetry and drama	do	4	14, 15, 15, 15
6	Seventeenth century prose	do	3	2, 2, 2
10	Outlines French literature in English.	do	2	6, 6
Spanish	2 Intermediate Spanish	do	4	18, 18, 17, 18
Norse	2 Beginning Norse	do	4	22, 21, 22, 22
4	Advanced Norse	do	4	14, 14, 14, 14
8	Norse literature	do	4	6, 6, 6, 6
16	Bjornson's dramas	do	2	3, 3
160	Theory and practice of teaching the Scandinavian languages.	do	1	1
Swedish	12 Beginning Swedish	do	2	1, 1
LAW.				
	Code pleading	Professor	2	30, 29
	Evidence	do	4	28, 28, 28, 28
	Practice court	do	3	19, 18, 18
	Bailments and carriers	do	4	16, 16, 16, 16
	Brief making	do	1	21
	Damages	do	3	26, 25, 25
	Contracts	do	3	29, 30, 28
	Equity	do	4	19, 20, 20, 20
	Trusts	do	2	18, 18
	Real property	Instructor	3	33, 33, 33
	Agency	Assistant professor	3	33, 32, 32
	Wills	do	2	17, 17
	Torts	do	2	23, 22
	Quasi-contracts	do	2	8, 8
	Documents	Instructor	1	16
	Procedure	do	2	25, 25
MANUAL TRAINING.				
II	Woodwork	Instructor	5	4, 4, 4, 4, 4
IIΓ	do	do	5	2, 2, 2, 2, 2
	Advanced woodwork	do	3	2, 2, 2
V	Mechanical drawing	do	5	9, 8, 8, 5, 9
MATHEMATICS.				
Math	2 Analytical geometry	Professor	4	11, 11, 11, 11
2	do	do	4	8, 8, 8, 8
2	do	do	5	15, 16, 16, 16, 16
4	Calculus	do	4	29, 29, 29, 29
8	Theory of equations	do	2	1, 1
18	Teachers' course	do	3	6, 6, 6
	Solid geometry	do	1	10

10–16, 1916—University and agricultural college—Continued.

Agricultural College.					
Coourse number.	Subjdct.	Rank of instructor.	Meetings.	Students attending.	Year of course.
LANGUAGE—Continued.					
German..... 5	German comedies.....	Professor.....	4	12, 13, 13, 11....	Soph.
9	Faust.....	....do.....	2	3, 2.....	Junior.
French..... 3	Reading and composition.....	Professor.....	4	7, 7, 5, 5.....	Freshmen.
6	Classic French dramas.....	....do.....	4	4, 4, 2, 2.....	Soph.
LAW.					
MANUAL TRAINING.	Manual training for teachers...	Instructor.....	5	8, 8, 8, 2, 2.....	
MATHEMATICS.					
Math..... 9	Higher algebra.....	Professor.....	4	6, 7, 6, 5.....	Freshmen.
10	....do.....	Assistant professor	4	6, 6, 6, 6.....	Do.
11	Plane trigonometry.....	....do.....	2	14, 15.....	Do.
14	Integral calculus.....	Professor.....	4	4, 4, 4, 4.....	Soph.
16	Slide rule.....	Assistant professor	2	5, 5.....	Freshmen.
17	Graphs.....	....do.....	2	2, 2.....	Soph.
19	Mathematics of investment....	....do.....	3	11, 11, 11.....	Freshmen.

TABLE 43.—*Meetings of classes held during the week of April*

University.				
Course number.	Subject.	Rank of instructor.	Meetings.	Students attending.
MEDICINE.				
Anat. 2	Neurology	Professor	6	11, 11, 11, 11, 11, 11.
4	Dissection	do	6	11, 11, 11, 11, 11, 11.
	Public hygiene and sanitation	do	2	9, 9.
Phys. 2	Digestion	Associate professor	2	13, 13.
2	Digestion, laboratory	do	1	13.
2a	Bio-chemistry	do	1	13.
2a	Bio-chemistry, laboratory	do	1	13.
4	Nervous system	do	2	9, 9.
4	Nervous system, laboratory	do	2	9, 9.
6	Pharmacology	do	3	10, 10, 10.
6	Pharmacology, laboratory	do	2	10, 10.
	Pathology	Assistant professor	5	9, 9, 9, 9, 9.
	Principles of nursing	Instructor	3	7, 7, 7.
	Principles of nursing, laboratory	do	1	4.
	do	do	1	3.
	General physiology	do	4	19, 19, 20, 20.
MILITARY DRILL.				
MUSIC.				
Music. 2	Harmony	Associate professor	2	6, 5.
6	History of music	do	2	8, 6.
8	Vocal sight reading	do	1	9.
12	Choral singing, men	do	2	28, 28.
12	Choral singing, women	do	2	33, 36.
14	Orchestra	do	1	12.
16	Musical appreciation	do	1	6.
18	Elements and principles	do	1	8.
10	Band	Assistant	2	28, 28.
PHILOSOPHY.				
Philos. 2	Ethics	Professor	4	9, 9, 8, 8.
2	do	Assistant professor	4	15, 15, 15, 15.
4	Abnormal psychology	Professor	4	12, 11, 12, 12.
8	Introduction to philosophy	do	3	6, 6, 5.
	Educational psychology	Assistant professor	4	7, 7, 7; 6.
PHYSICAL TRAINING.				
Physical education 2	Physical education, for men	Assistant professor	2	32, 32.
2	do	do	2	42, 42.
2	do	do	2	33, 33.
4	do	do	2	23, 23.
170	Teaching physical education	do	1	3.
	Track athletics	do	6	25, 25, 25, 25, 25, 25.
	Base ball	Instructor	6	35, 35, 35, 35, 35, 35.
2	Physical education, for women	do	2	26, 26.
2	do	do	2	40, 40.
2	do	do	2	30, 33.
4	do	do	2	35, 34.
4	do	do	2	24, 24.
6	do	do	2	10, 10.
10	Esthetic dancing, women	do	2	7, 9.
12	Playgrounds, women	do	2	6, 6.
PHYSICS.				
Physics. 1	General physics, lecture, experiments	Associate professor	3	31, 31, 31.
1	General physics, recitation	do	2	17, 14.
3	General physics, laboratory	Assistant professor	2	19, 14.
3	do	do	2	17, 17.
4	Engineering physics	Professor	4	25, 25, 25, 25.
4	Engineering physics, laboratory	Assistant professor	1	15.

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Agricultural College.

Course number.	Subject.	Rank of instructor.	Meetings.	Students attending.	Year of course.
PHARMACY, ETC.					
Pharm..... 4	Pharmacopœial preparations.	Assistant professor	4	11, 11, 11, 11....	Soph.
5	Operative pharmacy, etc.....	do.....	2	10, 10.....	Do.
9	Drug assaying.....	do.....	3	7, 7, 7.....	Junior.
10	United States Pharmacopœia, etc.	do.....	5	6, 7, 7, 7, 7.....	Do.
12	Veterinary pharmacy.....	do.....	4	4, 3, 4, 4.....	Soph.
M. M..... 2	Materia medica and therapeutics.	Professor.....	4	6, 7, 7, 7.....	Do.
	Pharmaceutical Latin.....	do.....	4	10, 10, 10, 9.....	Do.
	Pharmaceutical problems.....	do.....	3	10, 10, 10.....	Do.
Bact..... 9	General bacteriological technic.	Assistant professor	3	4, 4, 4.....	Do.
13	General bacteriological technic for home economic students.	do.....	3	4, 4, 4.....	Do.
10	Pathogenic bacteriology.....	do.....	2	3, 3.....	Senior.
11	Dairy bacteriology.....	do.....	4	5, 5, 5, 5.....	Do.
12	Bacteriological research.....	do.....	4	1, 1, 1, 1.....	Do.
Vet. sci..... 3	Veterinary science.....	Professor.....	5	7, 8, 8, 8, 8.....	Soph.
10	Veterinary anatomy.....	Assistant professor	5	8, 8, 8, 8, 9.....	Freshman.
13	Veterinary hygiene.....	do.....	5	5, 5, 5, 4, 5.....	Soph
15	Materia medica.....	do.....	5	4, 4, 4, 4, 4.....	Do.
18	Physiology.....	do.....	5	8, 8, 8, 8, 9.....	Freshman.
MILITARY DRILL.					
	Military drill.....	Professor.....	3	51, 50, 52.....	
MUSIC.					
	Band.....	Director.....	3	21, 20, 22.....	
	Harmony.....	do.....	3	4, 4, 4.....	
	Musical history.....	do.....	2	2, 2.....	
PHILOSOPHY.					
Philos..... 3	Ethics.....	Professor.....	4	3, 4, 4, 4.....	
PHYSICAL TRAINING.					
Gymnastics..1	Gymnasium.....	Instructor.....	3	16, 15, 16.....	
2	.....do.....	.....do.....	3	14, 14, 14.....	
3	.....do.....	.....do.....	2	19, 18.....	
4	.....do.....	.....do.....	2	14, 15.....	
5	.....do.....	.....do.....	2	3, 3.....	
6	.....do.....	.....do.....	3	1, 1, 1.....	
	Physical training.....	Director.....	5	25, 25, 25, 25, 25.	
PHYSICS.					
Physics.....6	Magnetism and electricity.....	Professor.....	2	18, 18.....	Soph.
6	Magnetism and electricity, laboratory.	.....do.....	2	12, 12.....	Do.
8	Household physics.....	.....do.....	4	32, 32, 32, 32....	Do.

TABLE 43.—*Meetings of classes held during the week of April*

University.				
Course number.	Subject.	Rank of instructor.	Meetings.	Students attending.
PHYSICS—Contd.				
Physics.....4	Engineering physics, laboratory...	Assistant professor	2	11, 11.....
6	Variable currents.....	Professor.....	2	2, 2.....
12	Graduate research.....	.....do.....	4	1, 1, 1, 1.....
14	Graduate colloquium.....	.....do.....	1	1.....
POLITICAL AND SOCIAL SCIENCE.				
Economics.....2	Banking.....	Professor.....	4	26, 27, 26, 25.....
28	Agricultural economics.....	.....do.....	4	7, 7, 7, 6.....
28	Taxation.....	.....do.....	2	3, 3.....
Political science..32	American government.....	.....do.....	2	18, 19.....
34	City government.....	.....do.....	2	7, 6.....
Economics.....54	Graduate course.....	.....do.....	2	1, 1.....
NOT OTHERWISE CLASSIFIED.				
	Library science.....	Assistant professor	1	7.....
Geology.....1	General geology.....	Professor.....	5	18, 25, 25, 25, 11...
4	Physiography.....	Associate professor	3	53, 53, 53.....
4	.....do.....	.....do.....	2	25, 29.....
8	Economic geology.....	Professor.....	3	2, 2, 2.....
10	Petrology.....	.....do.....	2	4, 4.....
14	Geographic influences.....	Associate professor	3	6, 6, 6.....
22	Geological seminar.....	.....do.....	1	5.....
Ceramics.....4	Clay work laboratory, handicraft course.	Instructor.....	2	8, 8.....
6	Clay work laboratory.....	.....do.....	1	3.....
6	.....do.....	.....do.....	1	3.....
8	.....do.....	.....do.....	1	10.....
8	.....do.....	.....do.....	1	9.....
10	.....do.....	.....do.....	1	8.....
12	.....do.....	.....do.....	1	7.....

10–16, 1916—University and agricultural college—Continued.

Agricultural College.					
Course number.	Subject.	Rank of instructor.	Meetings.	Students attending.	Year of course.
PHYSICS—Con.					
POLITICAL AND SOCIAL SCIENCE.					
History.....12	History of Greek civilization and art.	Professor.....	4	13, 12, 13, 13....	
Social science 4	Sociology.....	.....do.....	4	25, 29, 26, 28....	Freshman.
8	Current events.....	.....do.....	1	4.....	
10	Rural economics.....	.....do.....	4	16, 18, 18, 15....	Junior.
NOT OTHERWISE CLASSIFIED.					
	Library methods.....	Assistant librarian.	1	8.....	

TABLE 44.—*Courses offered at the agricultural college in April, 1916, that would have been discontinued if the recommendation made in this report had been in effect.*

		Students involved.
Junior year:		
Arch.	19. History of sculpture and painting	2
C. E.	8. Hydraulics	4
M. E.	15. Internal combustion engines	8
M. E.	20. Mechanics of materials	3
M. E.	23. Materials testing laboratory	4
M. E.	32. Materials of construction	6
German	9. Faust	3
	Total class attendance	25
Senior year:		
C. E.	17. Water purification, sewage disposals, and sanitation	1
C. E.	19. Bridge design	1
M. E.	38. Machine design	2
M. E.	39. Heat engines	1
	Total class attendance	5

The number of students involved is negligible when compared with the saving in cost of instruction and the time, energy, and equipment now devoted to these small classes, which would be released for more economical and more efficient service in other directions. (See also, in this connection, Tables 55 and 56, Appendix XI.)

As bearing on statements elsewhere in this report in regard to the need and demand for courses in the various forms of engineering, the danger of excessive division of the subject, and of unnecessary costly duplication, the number and size of classes reported at the university and college should be given careful study. It should be noted that each institution reports six classes in engineering with only 1 student each, that all the classes at both institutions are small, and that in all forms of engineering at the agricultural college there are reported only 25 students in junior classes and 13 in senior classes, repeaters included. Of the 13 seniors, 8 were taking the course in "concrete and drainage for agricultural students."

In relation to the assumed principle that a subject for which there is not sufficient demand to justify its being included in the curriculum of more than one institution should be given at the institution which already and for other reasons offers the necessary courses in accompanying and supporting subjects, and further in relation to the commission's recommendation[1] as to the distribution of engineering between the two institutions, the courses and the size of classes in mathematics, physics, chemistry, and biology should be carefully studied.

[1] See recommendation 5, ch. 12.

The basis of the recommendation[1] of the commission that languages and literature be considered only as service courses at the agricultural college, and that degree courses in these subjects be offered only at the university, is found in the comparison of the courses taken and the size of courses at the two institutions. Apparently there were in April at the agricultural college only two students of these subjects in classes above the second year, the two German students taking the course in Faust in the junior year.

That the agricultural college is not yet performing its function as an agricultural college as fully as the agricultural college of such a State as North Dakota should is shown by the fact, revealed by this table, that in April, when at least a large majority of all the regular students of the college were present, the aggregate number of attendants at all of the 21 classes in agriculture which met during that week was only 211. Only 42 of these were in junior classes and only 4 were in senior classes. Since most of the students were counted two or more times each, the actual numbers of individuals involved are much smaller than the figures given. Plainly all these numbers should be very much larger, and the college should put forth every effort to bring more students into this department of its work. The number of graduates of the institution who are now engaged in agricultural pursuits also supports this contention.

[1] See recommendation 9, ch. 12.

Chapter XII.

SUMMARY OF RECOMMENDATIONS.

PRESUPPOSITIONS.

In making these recommendations it is assumed:

1. That all the institutions to which they refer belong alike to all the people of the State and constitute an integral part of the system of public education, and that no one of them is thought of as belonging to any particular class of people—as the poor or the rich, the people of the country or the people of the city, the farming or the industrial or the professional classes.

2. That each institution has its own particular function or group of functions to perform and finds its greatest usefulness in rendering to the people of the State its own peculiar service.

3. That all these forms of service are equally worthy and dignified if performed equally well.

4. That the officers of no one of these institutions desire to magnify for itself alone the institution for which they are responsible, but only to make it render most fully and most efficiently its particular service without encroaching upon the functions of any other institution.

5. That above all these institutions are the people of the State who have established them and who maintain them by their taxes, who are equally interested in them all, and who expect from all loyal service, each in its own field, and economical use of funds provided.

6. That the people of the State are both willing and able to provide all funds that may be needed by any institution for its legitimate work, but that they are neither willing nor able to provide funds for any one of the institutions to extend its work into fields covered by other institutions.

7. That the kind, degree, and quantity of higher education to be provided by a State at any time, particularly education of a vocational nature, should be shaped according to the character of the people, their social and political ideals, their occupations, and their vocational needs as determined by the natural resources of the State.

8. That in a State which has established more than one institution of higher learning the people and their responsible representatives

have the right and must face the obligation to apportion among these institutions the work of higher education in such way as will best serve all the interests of the State, and that it is their right and duty to change this apportionment whenever the public interest may demand such change, provided it may be done without violation of contract or of obligation to the Federal Government.

9. That the offering of the same subjects or the same or similar courses of study in the curricula of two or more institutions in the same State should be avoided as uneconomical and harmful duplication of effort: (*a*) When the total demand for such subjects or courses of study in the life of the State and the number of students applying therefor are not sufficient to justify the expense of giving instruction in them at more than one place: (*b*) when in the attempt to maintain such courses at any one of the institutions money, equipment, time, and energy are used that might be more profitably devoted to other purposes; (*c*) when the attempt to maintain such courses tends to confuse the purposes of the institution and to divert it from its more legitimate and immediate aims: and (*d*) when such division or duplication tends to detract from and weaken the courses in question as given at the institution in which they primarily and more legitimately belong.

10. That any subject which two or more institutions may desire to include in their curricula, but for which there is clearly not sufficient demand to justify its being offered by more than one institution, should be offered at that institution which already has in its curriculum as an essential part of its main purpose the necessary accompanying or supporting subjects, rather than at an institution in which such accompanying or supporting subjects would need to be provided for this particular purpose and without necessary relation to other subjects taught in that institution or to its main purposes; as, for examples, engineering courses dependent for their development on advanced courses in mathematics and physics, or other engineering courses dependent for their development on advanced courses in chemistry or biology.

11. That no institution established and maintained as a State institution should function chiefly as a local institution, appropriating State funds to purely local uses.

12. That the board of regents responsible for the general management of all the institutions included in this survey, while seeking to promote the harmonious cooperation of all as parts of one unified, flexible, adjustable, democratic system of education for the most efficient service of the State, desires also that the individuality, spirit, and best traditions of each institution shall be preserved.

RECOMMENDATIONS.

1. Education at the university and agricultural college.—The school of education at the university and the department of education at the agricultural college should be sufficiently enlarged to enable them to prepare high-school teachers, school superintendents, and supervisors for both elementary and high schools, and expert special teachers, in sufficient numbers to supply the demands of the schools of the State. Special teachers of agriculture, home economics, and industrial subjects should be prepared at the agricultural college. The university should prepare superintendents, high-school teachers, and supervisors in all subjects except agriculture, home economics, manual training, and other industrial subjects. The university should not undertake to prepare special teachers in home economics, but should give sufficient instruction in this subject and in methods of teaching it to enable young women to combine the teaching of this subject with other subjects in the high school. Neither the school of education at the university nor the department of education at the agricultural college should attempt to prepare teachers for the elementary schools.

2. The graduate schools.—Graduate work at the university and at the agricultural college should, for the present, continue to be limited to the requirements for the master's degree, and each institution should give graduate instruction only in those subjects which are considered major subjects at that institution. Graduate courses in education may be offered at each institution. The presidents of these institutions and the board of regents should work out plans for cooperation in graduate work where cooperation may be helpful. Duplication of graduate work would be unwarranted, costly, and wasteful.

3. Home economics.—Instruction in home economics should be given at both the university and the agricultural college. Except for the purpose of preparing teachers of home economics for high schools, as elsewhere indicated, there should be at the university only such courses in home economics as will fit young women for the duties of intelligent home making, or such as will function as service courses[1] for those taking the course for nurses and possibly some other subjects. The agricultural college should offer both major and normal courses in home economics.

4. Music.—Instruction in music and especially training in chorus, orchestra, and band, may be given at all the institutions, and instruction in singing should be given to all students at the normal schools

[1] "Service courses are such subordinate subjects as are essential to the proper cultivation of a major line." For a discussion of the principle of "major and service lines" of work, see p. 61.

to the extent needed for use in the elementary schools, but no attempt should be made to give advanced and professional instruction in music except at the university.

In all these schools there should be a strong cultural spirit, but only at the university should there be offered special or professional courses in the fine arts or degree courses in literature, languages, and pure science.

5. Engineering.—Mining engineering is placed at the university by the constitution of the State. Agricultural and what may be called industrial engineering, as defined in this section of these recommendations, should be given only at the agricultural college. Chemical engineering should also be given at the agricultural college when there is demand for its development in the State. Degree courses in other forms of engineering should be given only at the university. Except for mining engineering and agricultural and industrial engineering, the first two years of any engineering course may be given at either institution when authorized by the board of regents.

The courses in agricultural engineering and those which may be grouped under the term industrial engineering are recommended in order to meet the demands for practical engineering courses in connection with the industries growing out of or directly related to agriculture, and the large number of urban industries hitherto developed on an empirical basis, which are now undergoing a more scientific and technical development. To these latter courses the survey commission has for convenience given the designation industrial engineering, to distinguish them from the professional courses in mechanical, civil, and electrical engineering, which are already well organized in engineering schools. Such courses are given at the University of North Dakota and should not now, if ever, be duplicated at the agricultural college.

6. Reorganization of engineering at the university.—At the university all departments and courses of engineering, including mining, should be placed under the direction of one dean or other executive head.

7. Medical college.—Instruction in medicine at the university should continue to be given only in premedical courses and for the first two years' work of a medical college.

8. Instruction in agriculture.—Fully three-fourths of all the people of the State of North Dakota who are engaged in gainful pursuits are employed in agriculture or in occupations connected directly therewith. The agriculture of the State is carried on by farmers, a very large proportion of whom operate their own farms. These facts and others presented in this report indicate very clearly the importance of agriculture in the vocational education of the State and the need of instruction and training for large numbers of men

and women to the extent which will enable them to operate their own farms intelligently and successfully, as well as the need of highly technical training for a few. The agricultural college should devote its energies and means to instruction in agriculture and the immediately allied subjects in proportion to the needs herein indicated.

9. Liberal arts and science at agricultural college.—Courses in liberal arts and science at the agricultural college should be considered only as service courses,[1] and no degrees in the liberal arts and sciences should be given here.

10. Architecture.—There does not seem to be at present sufficient demand for architects and architectural engineers in the State of North Dakota to justify the maintenance of a school or of extensive courses in architecture or architectural engineering, either at the university or at the agricultural college. Instruction in these subjects at the agricultural college should be only of an elementary nature and should have special reference to farm buildings, warehouses, school buildings for rural and village communities, and other similar buildings.

11. Pharmacy.—Instruction in pharmacy should be continued at the agricultural college, and standards for admission to and graduation from this course should be raised as rapidly as possible to the completion of a full high-school course of four years for admission and a minimum of two years' instruction for graduation.

12. Relation of president of agricultural college to experiment station.—The president of the agricultural college should have general control of the experiment station and of its branches and of the extension department and be held responsible to the board of regents for their management.

13. Teaching by members of research staff.—Investigators, men and women engaged in research work, at the experiment station at Fargo, should, except in case of those whose duties are such as to make it inexpedient, be expected to teach some classes in the college; and the experiment station and its farms and laboratories, as well as the laboratories of the regulatory services, should be used under necessary restrictions as teaching agencies for undergraduate college students and as research agencies for graduate students.

14. Subexperiment stations and demonstration farms.—It is recommended that the board of regents cause a careful study to be made of the operations of the subexperiment stations and demonstration farms, with a view to determining whether or not much of the experimental work now under way might be carried on by farmers on their own premises, without other expense to the State than that of necessary supervision.

[1] See footnote on p. 172.

15. Commercial courses.—Commercial courses of higher or lower grade should be given in the university and the agricultural college; courses in farm accounting and rural economics should be given in the agricultural college, and probably also in the University. The normal schools should give courses in these subjects and in the simple forms of bookkeeping to the extent that they may be needed by teachers in the elementary schools; but the normal schools should not give commercial courses beyond the needs of these teachers.

16. Preparatory department at agricultural college.—The agricultural high school at the agricultural college should be discontinued as a preparatory school by dropping the lowest class each year beginning with 1917, so that after the beginning of the school year 1921 there will be no college preparatory classes at this institution.

17. School of agriculture, elementary mechanic arts, and home economics.—The 22-weeks courses at the agricultural college should be strengthened and organized into a school of agriculture, elementary mechanic arts, and home economics for young men and women who do not expect to attend college or to become teachers. This school should offer three-year courses, the sessions being held during the winter and lasting five and one-half or six months; and the desirability of repeating these courses with necessary variations in sessions of similar length in the summer months should be considered.

18. Special short courses.—The short winter courses in extension work for farmers and farmers' wives at the agricultural college are to be commended, but those attending these courses should not be taught in the regular classes of the college, of the agricultural high school, or of the 22-weeks courses as now conducted, or in the school of agriculture, elementary mechanic arts, and home economics, the formation of which is recommended elsewhere.

19. Extension courses.—Since Federal and State laws provide liberally for extension work in agriculture and home economics under the direction of the agricultural college, no other institution in the State should undertake extension work in these subjects. Any extension work done by instructors in agricultural schools in the State should be under the direction of the agricultural college. The normal schools should offer extension courses only for teachers, as explained elsewhere. Representatives of the university and of the agricultural college should confer with the board of regents for the purpose of determining the division of all other forms of extension work between the two institutions and of devising means for necessary cooperation. All extension work should be conducted with special reference to the instruction of the public in the subjects considered and not as a means of advertising the institutions.

20. Preparation of teachers for rural schools.—Since more than four-fifths of all the children of North Dakota live in the open country and in small villages, and only one-tenth live in places of 2,500 or more, all normal schools should, without neglecting the training of teachers for city schools, make it their chief purpose to prepare teachers for rural schools. Their courses of study and their practice and observation schools should be reorganized as may be necessary for this purpose. It should be recognized that teachers for the elementary rural schools need no less education, professional knowledge and skill, maturity and native ability than teachers of schools of the same grade in urban communities.

21. Preparation of teachers for elementary schools.—Until there is a sufficient number of well-prepared teachers for all the elementary schools of the State the normal schools should confine their activities to the preparation of teachers for these schools. In so far as possible they should exclude students who are not definitely preparing for teaching.

22. Standard of admission to normal school.—The standard of admission to the normal schools should be gradually raised to graduation from a standard high school of four years or its equivalent, or of six years when the high school is preceded by only six years of elementary schooling. It is recommended that this be done by requiring one year of high-school work for admission in 1918, two years in 1919, three years in 1921, and four years in 1923 and thereafter.

For the sake of teachers of low grade of preparation already engaged in the schools of the State, the summer sessions of the normal schools should continue to admit and form classes for teachers of all grades of preparation, but should not admit persons who have less preparation than is required at any given time for admission to regular classes in the school except those who have already been employed as teachers.

23. Minimum salaries for teachers.—When the normal schools have definitely established their standards at graduation from a high school of four years for admission, and at two years of work above the high school for the normal school certificate, and three years of work above the high school for the normal school diploma, as herein recommended, the State should fix by law minimum salaries for teachers holding normal school certificates and for teachers holding normal school diplomas; the difference between the minimum salaries of the two classes being such as may seem to be justified by the different degrees of preparation. It should also provide by law for a definite increase in the minimum salaries of both classes of teachers when they have complied with the requirements for, and have been granted, the permanent license.

The first license granted to a prospective teacher coming from without the State should be a temporary license, and the permanent license should be granted on the same terms as to those who have had corresponding training or experience in North Dakota.

24. Short course in normal schools.—The 10½-months course in the normal schools should be discontinued after the end of the summer term of 1917.

25. More normal schools needed.—A normal school should be established immediately at Dickinson or elsewhere in the southwestern quarter of the State, and steps should be taken for the establishment of another normal school somewhere in the western half of the State as soon as a constitutional amendment for that purpose can be obtained.

26. Requirements for teaching certificates to correspond with normal school standards.—Standards of requirements for certification to teach in the elementary schools of the State should be advanced to correspond with the standards set by the normal schools for the award of their certificates and diplomas.

27. Professional reading and study for teachers.—The State board of education, with the assistance of the presidents of the normal schools and the heads of departments of education at the university and the agricultural college, should prepare for all persons who leave the normal schools with any kind of certificate or diploma which may be accepted as a license to teach in the elementary schools of the State such courses of study, including both professional and cultural subjects, as can reasonably be completed within a period of three years by devoting to them not less than 10 hours per week for 10 months of each year. Examinations on given portions of these courses should be held from time to time, and no person should be granted a permanent license to teach in the public schools of the State until after having completed the courses prescribed, or their full equivalent, and after having passed satisfactorily final examinations on them.[a] The final examination should come not earlier than two nor later than five years after the time of leaving the normal school.

To any person of good moral character who holds a certificate or diploma of a normal school in this State, and who satisfactorily passes examinations in the courses of study outlined, and who is certified by any qualified superintendent or supervisor as having taught satisfactorily not less than 16 months in the elementary schools of North Dakota, there should be issued a life license to teach in the elementary schools of the State.

[a] Nothing in this recommendation or in recommendation 23 should operate to prevent the State of North Dakota from accepting at their full value certificates issued in other States which maintain equally high standards.

28. Requirements for normal certificates and diplomas.—The standards of instruction required for certificates or diplomas from the normal schools should be raised as follows: In 1918 no certificate or diploma should be given for less than one year of work above the completion of a high-school course of four years; in 1920 no certificate or diploma should be given for less than two years of work above the completion of a high-school course of four years; in 1923 and thereafter the certificate of the normal school should be given for the completion of two full years of not less than 36 weeks each above the completion of a full high-school course of four years, and the diploma of the schools should be given for three full years of not less than 36 weeks above the completion of a high-school course of four years.

29. Graduates of university and agricultural college as teachers.—A policy similar to that recommended for the graduates of the normal schools, both in regard to advanced courses of study, examinations, and permanent licenses to teach in the schools of the State, or to hold positions as superintendents and supervisors, should apply to the graduates of the university and the agricultural college.

30. The normal and industrial school.—The normal and industrial school at Ellendale should prepare teachers for the elementary schools of the State on the same basis as other normal schools. In addition to its work as a normal school, it should, because of its equipment for instruction in industrial subjects, continue for the present to give instruction in these subjects, adapting this instruction to the special needs of the people of the south central counties which it serves.

31. The school of science.—For the present and until the State has become much more populous than it is now and the attendance in the lower classes of the university and the agricultural college much larger than at present, the school of science at Wahpeton should function only as a school of secondary grade in science, agriculture, mechanic arts, and household arts. It should give special attention to industrial subjects, both for boys and girls, and it might include commercial subjects, including bookkeeping, stenography, and similar subjects, but this and other State schools should avoid becoming local elementary or high schools. There can be no justification for local schools of this character maintained at the expense of the taxpayers of all the State. The board of regents should consider also the advisability of establishing here a school of the kind recommended for the agricultural college and at Bottineau.

32. The school of forestry.—The school of forestry at Bottineau does not now function as a school of forestry and has very few students other than local students of elementary and high-school grade or irregular students from the adult population of Bottineau. The

constitution provides that the legislature may determine the kind of school to be maintained at Bottineau. The legislature has declared its function to be that of an agricultural high school, giving special attention to forestry and horticulture. The board of regents should consider the advisability of reorganizing this school, with one session of six months in winter and another of four and one-half or five months in summer, the work of both sessions to be made as practical as possible, offering opportunity for much outdoor farm work in the summer session. The courses of this school should be for three years, as recommended for the school of agriculture at the agricultural college.

33. Instruction in forestry.—The forestry and nursery work required of the school of foresty at Bottineau should be put under the direction of the agricultural college, and all instruction of college grade in forestry which may be thought needful for the State should be given at Fargo. It may be well to continue the nurseries at Bottineau, and to establish similar nurseries at other places in the State for convenience of distribution.

34. The library commission.—The library commission should be given the means of extending the kind of work it is now doing so as to serve a much larger number of people than it now serves, and it should begin a campaign for the establishment of a county library at the county seat of each county with branch libraries at smaller towns, and for the use of schools as distributing centers. Legislation should be requested providing for the establishment and maintenance of such county libraries.

35. Public school survey.—It is recommended that a careful and thorough survey be made of the elementary schools and high schools of the State for the purpose of determining details of necessary legislation for the improvement of these schools and also for the purpose of recommending changes in the courses of study, the local management, and internal organization of the schools, and of devising plans for the erection and equipment of school buildings and of meeting other ascertained needs of these schools. A conference of the State board of regents and the State board of education should be held to consider this matter.

36. Administration of State educational system.—It is believed that the entire system of education of the State of North Dakota might be unified and rendered more efficient if the board of regents were enlarged and given control of and responsibility for the management of all the public schools of the State. This board should elect a commissioner of education, and assistant commissioners for higher education, secondary education, elementary education, vocational education, library commission, and other assistants at fixed salaries and for specified terms of service, which should be compara-

tively long. It should be lawful for the board to elect commissioners and assistants either from the State of North Dakota or elsewhere, and these should be elected only for their fitness and definite preparation for the duties of their respective offices.

That portion of the constitution referring to the office of the State superintendent of public instruction should be so amended as to make possible the policy here recommended. It is believed also that there should be in each county a county board of education elected by the people or appointed in some way which will guarantee efficient service. This board should consist of five members; the term of office of each should be five years, and not more than two should be retired in any biennium. This board of education should have control of all the public schools of the county and should elect, subject to the approval of the State board of regents, and either from within or without the county, qualified superintendents, assistant superintendents, and supervisors.

37. Guide to the institutions.—The board of regents should have prepared for the use of prospective students in the State a pamphlet setting forth clearly and simply the purposes and aims of each of the several institutions, its courses of study, its requirements for admission and graduation, the cost of attendance, and other similar items, to the end that any prospective student may be able to determine as accurately as possible the special advantages to be had at each institution.

38. Building and campus plans.—That before other buildings are erected or additions made to the campus at any of the institutions now in existence, and before any buildings are erected at any institutions to be established in the future, the board of regents shall have made plans for campus and building development as has been done for the university, to the end that there may be a consistent and progressive policy of building for each of the institutions.

39. Vocational survey.—It is recommended that the board of regents, through its commissioner of education and with the cooperation of the university and the agricultural college, shall have made a careful and comprehensive survey of the industries and occupations of the people of the State, and a study in detail of the educational preparation needed for success in all the more important of them, and that the results of this survey be published for the guidance of young people in choosing their vocations and of the schools in making up their courses of study.

40. Institutional organization and administration.—The board of regents should cause to be made, through its commissioner of education or otherwise, a careful study of the organization and work of each of the institutions under its control, to ascertain—

(*a*) To what extent in any of them, if at all, an unnecessary division of subjects offered, and the offering of subjects for which there is little or no demand in the State, may result in a large number of small and costly classes which might be consolidated or eliminated without loss to the State, without injury to any large number of individuals, and with profit to the institution.

(*b*) Whether and to what extent, to the detriment of any institution, large numbers of students in the lower classes are taught by inexperienced teachers on low salaries, while the abler and more experienced teachers have only very few students in the higher classes.

(*c*) Whether or not too large a proportion of the faculties of some of the schools are made up of young and inexperienced teachers employed at low salaries. Such an investigation of some of the normal schools seems to the survey commission to be especially desirable.

(*d*) To what extent the efficiency of the work of teachers in the schools is lowered because of the large number of courses and of weekly class meetings for which they are responsible.

(*e*) Whether or not in some of these schools too large a proportion of the total expenditure is for administration and other non-instructional purposes.

(*f*) Whether or not it is desirable to establish a schedule of salaries in the normal schools and to increase to a considerable extent the average of salaries in these schools, to the end that they may more certainly be able to obtain and retain the services of teachers with the education, maturity, and experience necessary for those engaged in the task of instructing and training professional teachers for the elementary schools of the State.

It is believed that the executive officers and faculties of all these schools will welcome such a study and gladly assist in making it.

Several of these points are discussed more or less extensively in this report, but on none of them has the survey commission sufficient information to enable it to make formal and final recommendations.

APPENDIX.

I. THE MOST IMPORTANT PROVISIONS IN THE ACT CREATING THE STATE BOARD OF REGENTS, SESSION LAWS, 1915.

The State board of regents, consisting of five members appointed by the governor and confirmed by the senate, is created for the general control and administration of the following State educational institutions:

1. The State university and school of mines, at Grand Forks, with their substations.
2. The State agricultural college and experiment station, at Fargo, with their substations.
3. The school of science, at Wahpeton.
4. The State normal schools at Valley City, Mayville, and Minot.
5. The normal and industrial school, at Ellendale.
6. The school of forestry, at Bottineau.
7. The State library commission, at Bismarck.
8. And such other State educational institutions as may be hereafter established.

The State board of regents shall assume all the powers and perform all the duties now exercised or performed by the normal board of control and the several boards of trustees of the institutions included under this act.

The State board of regents first appointed shall, as soon as practicable after having organized, procure to be made by a competent expert, or experts, from without the State, an educational survey of all institutions under its control, for the purpose of ascertaining wherein the efficiency of the State educational institutions can be best served and economy in conducting them may be best practiced.

Upon the completion of such educational survey the State board of regents shall appoint from without the State a State commissioner of education, who shall perform such duties of examination, inspection, and visitation as the board may direct, and shall advise the board on all matters pertaining to the curricula, coordination, and correlating of work in the institutions under the control of such board, and he shall make a special study of the particular needs and requirements of each institution and shall report thereon to the board at such time as they shall direct.

The State board of regents shall coordinate and correlate the work in the different institutions so as to prevent wasteful duplication, and to develop cooperation among such institutions in the exchange of instructors and students, and shall fix a tuition to be paid in such institutions or any department thereof when not provided by law. It shall make recommendations in regard to needed legislation for the institutions under its control, prepare a budget setting forth the financial needs of all State educational institutions under its supervision and control for the period for which an appropriation is made.

In order to effect the greatest economy, efficiency, and facility in providing for the needs and work of the various institutions, the president of each institution shall submit to the State board of regents, at least once each year, a budget showing the needs and amounts recommended for the work of the various departments of the institutions, and for improvements, repairs, miscellaneous items of maintenance, and such other items as shall seem expedient.

There is hereby appropriated the sum of $18,000 annually, or as much thereof as may be necessary, to carry out the provisions of this act.

In conformity with the provisions of this bill, Hon. L. B. Hanna, governor of North Dakota, appointed the following persons members of the State board of regents:

Ex-Gov. Frank White, Valley City.
Dr. J. D. Taylor, Grand Forks.
Mr. Emil Scow, Bowman.
Mr. L. F. Crawford, Sentinel Butte.
Mr. J. A. Power, Leonard.

After the presentation of draft of the report of the survey the board of regents appointed Dr. Edwin B. Craighead commissioner of education. Dr. Craighead took up the work of commissioner of education on August 1, 1916.

The State board of regents, the commissioner of education, and the secretary of the board of regents, Mr. Charles Brewer, have offices in the State capitol building, at Bismarck.

II. CONSTITUTIONAL PROVISIONS AND EDUCATIONAL LEGISLATION IN NORTH DAKOTA.

Below are given abstracts of the constitutional provisions relating to the State educational institutions:

ARTICLE VIII, SEC. 147. A high degree of intelligence, patriotism, integrity, and morality on the part of every voter in a government by the people being necessary in order to insure the continuance of that government and the prosperity and happiness of the people, the legislative assembly shall make provision for the establishment and maintenance of a system of public schools which shall be open to all children of the State of North Dakota and free from sectarian control. This legislative requirement shall be irrevocable without the consent of the United States and the people of North Dakota.

SEC. 149. In all schools instruction shall be given as far as practicable in those branches of knowledge that tend to impress upon the mind the vital importance of truthfulness, temperance, purity, public spirit, and respect for honest labor of every kind.

SEC. 150. A superintendent of schools for each county shall be elected every two years, whose qualifications, duties, powers, and compensation shall be fixed by law.

SEC. 151. The legislative assembly shall take such other steps as may be necessary to prevent illiteracy, secure a reasonable degree of uniformity in course of study, and to promote industrial, scientific, and agricultural improvements.

SEC. 152. All colleges, universities, and other educational institutions, for the support of which lands have been granted to this State, or which are supported by a public tax, shall remain under the absolute and exclusive control of the State. No money raised for the support of the public schools of the State shall be appropriated to or used for the support of any sectarian school * * *

ART. XVII, SEC. 209. The labor of children under 12 years of age shall be prohibited in mines, factories, and workshops in this State.

ART. XIX, SEC. 215. The following public institutions of the State are permanently located at the places hereinafter named, each to have the lands spe-

cifically granted to it by the United States, in the act of Congress, approved February 22, 1889, to be disposed of and used in such manner as the legislative assembly may prescribe, subject to the limitations provided in the article on school and public lands contained in this constitution: * * *

Second. The State university and the school of mines at the City of Grand Forks, in the County of Grand Forks.

Third. The agricultural college at the City of Fargo, in the County of Cass.

Fourth. A State normal school at the City of Valley City, in the County of Barnes; and the legislative assembly in apportioning the grant of 80,000 acres of land for normal schools made in the act of Congress referred to shall grant to the said normal school at Valley City as aforementioned 50,000 acres, and said lands are hereby appropriated to said institution for that purpose * * *

Seventh. A State normal school at the City of Mayville, in the County of Traill; and the legislative assembly in apportioning the grant of lands made by Congress in the act aforesaid for State normal schools shall assign 30,000 acres to the institution hereby located at Mayville, and said lands are hereby appropriated for said purpose. * * *

SEC. 216. The following-named public institutions are hereby permanently located as hereinafter provided, each to have so much of the remaining grant of 170,000 acres of land made by the United States for "other educational and charitable institutions" as is allotted by law, namely: * * *

Third. An industrial school and school for manual training, or such other educational or charitable institutions as the legislative assembly may provide, at the Town of Ellendale, in the County of Dickey, with a grant of 40,000 acres.

Fourth. A school of forestry, or such other institution as the legislative assembly may determine, at such place in one of the Counties of McHenry, Ward, Bottineau, or Rolette as the electors of the said counties may determine by an election for that purpose, to be held as provided by the legislative assembly.

Fifth. A scientific school, or such other educational or charitable institution as the legislative assembly may prescribe, at the City of Wahpeton, County of Richland, with a grant of 40,000 acres.

Sixth. A State normal school at the City of Minot, in the County of Ward: *Provided*, that no other institution of a character similar to any one of those located by this article shall be established or maintained without a revision of this constitution.

The Minot State Normal School was established, under constitutional amendment, approved March 10, 1913.

At the election in November, 1916, the people of North Dakota will vote upon a constitutional amendment, which has been passed by the legislature, locating a normal school at Dickinson.

SESSION LAWS OF 1915.

Section 1416. Maintenance of State educational institutions.—For the purpose of providing for the maintenance of the State university and school of mines at Grand Forks, the agricultural college at Fargo, the State normal school at Valley City, the State normal school at Mayville, the State normal school at Minot, the school for the deaf and dumb at Devil's Lake, the school of forestry at Bottineau, the North Dakota academy of science at Wahpeton, the normal and industrial school at Ellendale, as a part of the public school system of this State, there is hereby levied upon all the taxable property in the State, real and personal, an annual tax of $847,880.

This annual tax takes the place of the millage tax by which these institutions were formerly supported, and which was repealed by the act of 1915, of which this is a part. These schools and all other schools heretofore established, or that may be hereafter established, by law and maintained by public taxation constitute the system of "free public schools" of the State of North Dakota.

Section 1418. Taxes, how apportioned.—Such taxes levied shall be apportioned by the State treasurer to the several institutions herein mentioned as follows:

$102,720 to the State University and school of mines at Grand Forks;
$61,800 to the agricultural college at Fargo;
$41,580 to the State normal school at Minot;
$46,200 to the State normal school at Valley City;
$36,960 to the State normal school at Mayville;
$18,480 to the school for the deaf and dumb at Devil's Lake;
$6,180 to the school of forestry at Bottineau;
$21,600 to the normal and industrial school at Ellendale;
$12,360 to the school of science at Wahpeton:

Provided, That all moneys hereafter collected pursuant hereto shall be apportioned as herein provided.

III. DISTRIBUTION OF COURSES AMONG THE INSTITUTIONS.

On October 12, 1912, Dr. Kendric C. Babcock, specialist in higher education in the Bureau of Education, wrote to the temporary educational commission of North Dakota, created by act of the legislative assembly (Session Laws of 1911, Ch. IX), the following letter, which, before being sent, was submitted to the Commissioner of Education and received his approval. Except for the modification of Section C in so far as it applies to the preparation of superintendents and supervisors of elementary schools, indicated in the chapter on normal schools, page 96 of this report, the survey commission approves the spirit and purport of this letter and the apportionment of work which it would make among the several institutions:

[Letter of Dr. Babcock.]

This discussion of "a State system of education ideally outlined and operated" assumes (1) that such system should have the functions of its different parts so distributed as to insure unity, harmony, economy, and efficiency; (2) that its higher education has well-developed and coordinated elementary and secondary schools as a basis, with differentiation of secondary schools to meet the varying local needs for vocational instruction in agriculture, commerce, and industrial arts; (3) that the three groups of higher schools should admit only those students who have completed the course of one of the secondary schools. From present indications the vocational schools of elementary or secondary grade, even those of agriculture, will at an early day be distributed rather than centralized as a part of a single agricultural college.

A.

The function of the State university should be (1) to give standard liberalizing courses in arts and sciences, covering four years and leading to a bachelor's degree; (2) to give engineering and technological courses, including agriculture, unless the State has a separate agricultural college, covering four or five years and leading to a bachelor's degree in some applied science; in case of separation of the agricultural college and the university, possibly a civil-engineering course should be developed at the agricultural college; (3) to organize professional schools or some definite portion of a prescribed professional course, such professional work to have as its ultimate basis the first two years of the liberal arts or general science courses; (4) to develop a graduate school offering courses primarily for holders of bachelors degrees and leading to the degrees of master and doctor, where the requirements of the Commonwealth constitute a sufficient demand and the resources of the State will permit; (5) to develop a department of extramural relations for reaching with information and inspiration persons whose age and occupation preclude their taking work at the university. In such State universities there should be a department for secondary and higher schools in the State.

B.

The State agricultural college, when separate from a State university in which provision is made for standard engineering and technological instruction, should devote itself strictly and mainly to the development of courses in agriculture and such branches of engineering and mechanic arts as are allied to agriculture. The States are obliged, in accordance with the terms of the Federal grant of land and money, to maintain on an approximate parity instruction in agriculture and the mechanic arts, and it rests with the States to determine how the Federal funds shall be apportioned to accomplish this purpose. An ideally operated system involves the ultimate elimination from the agricultural college of work of a secondary grade and work purely vocational in its character. A second feature of the work of the agricultural college and the agricultural experiment station should be the development of summer and winter short courses, farmers' institutes, cooperative demonstration work, and general agricultural extension and propaganda.

The work of the agricultural college and the State university, in fundamental and general subjects, of the first year or the first two years should be so coordinated that students may at the end of either of these years change from one institution to the other, as their interest or inclination may dictate, and receive full credit for courses already taken, so far as these courses may be counted at all for a degree in the second institution. The duplication of courses of the first two years, which require merely teachers, classrooms, and modern equipment in laboratory and library—for example, in mathematics, English, general chemistry, biology, and economics—may go on indefinitely, provided, of course, that the faculty and plant necessary for the work in these fundamentals are fully employed. The wastefulness of duplication usually falls most heavily in the intermediate and advanced courses. Broadly speaking, 20 sections of freshman mathematics may be as economically administered in three places as in one.

C.

The State normal schools should be held to broad preparation of teachers and supervisors for the elementary schools. Such preparation should include some cultural and liberalizing elements, in addition to the grounding in the subject matter and methodology of elementary education. When the normal schools as a whole have thus provided the elementary schools of the cities, villages, and rural communities with well-trained teachers, supervisors, and superintendents, whose education and discipline represent substantially a high-school course plus two years of professional and general training, it will be time for them to request the privilege of further upward expansion and the power to grant standard degrees. It is an undeniable fact that in scarcely a single State are the normal schools at the present time supplying more than 40 per cent of the annual demand for new teachers in the public-school system.

D.

Provisions for trade, industrial, and commercial schools in a State essentially agricultural in its interests may safely be made in the differentiated secondary schools and in technological departments of the university and the agricultural college. The argument that a State should supply each of its citizens with any sort of an education that he may desire does not rest upon a logical basis, nor should it lead to the establishment of all sorts of specialized schools by each State. Cooperation between States and subsidies to promising students to seek their instruction in the best possible schools—for example, mining or textile engineering—may well be adopted as a policy rather than the establishment of various weak and spiritless schools. A student in North Dakota who desires advanced instruction in architecture, marine engineering, or industrial chemistry other than agricultural chemistry should expect to seek instruction outside the State. I see no sufficient justification for a "school of science" separate from the State university, agricultural college, and vocational schools in any State.

E.

The work in engineering should be done in connection with the university and agricultural college; generally speaking, it should be done at the university, with its highly equipped departments of pure science, while engineering profes-

sions show a marked tendency to emphasize severe training in the principles and fundamentals of engineering, which can best be taught in a university spirit and in a university atmosphere.

F.

In the original agriculture land-grant act of 1862 the terms "agriculture" and "the mechanic arts" are used coordinately. The Federal authorities are insistent that each State accepting the land grant, and later grants of money, must provide adequately for both forms of education. By common understanding the term mechanic arts has been interpreted to include all forms of engineering, though there is serious doubt in many quarters as to whether this was the original intent of the men who passed the act of 1862; in other words, the grade of instruction in agriculture and in mechanic arts should be the same; if one is of college grade, the other should be of college grade. While the vocational or industrial work both in agriculture and mechanic arts will continue to need attention from the agricultural colleges for some years to come, there is good reason to believe that this is a passing phase and that the localities will ultimately provide for the greater part of such instruction. The agricultural college must become a college in fact as well as in name, no matter how differentiated its function. It must not continue to undermine the work which the various communities and the State itself are doing to build up sound secondary education throughout the State.

G.

Neither efficiency nor economy dictates that the work of the normal schools should be extended under present conditions to include the preparation of teachers for secondary schools; on the other hand, the correlation between the normal schools and the State university and the agricultural college should be so worked out that students completing the normal school course and finding themselves eager for more thorough or specialized preparation could enter one of the other institutions with definite credits toward a degree.

By way of summary it should be said that it is high time, in the interests of efficiency and economy, that various States should think of their educational systems as a unity, subject to the sovereign wisdom of the State, and that the State itself should dictate a far-reaching policy of coordination and control.

K. C. Babcock,
Specialist in Higher Education.

October 12, 1912.

IV. AGRICULTURAL ENGINEERING AND RURAL ARTS.

By L. H. Bailey.

[See p. 72.]

Farm mechanics and machinery.—The use of machinery has now come to be a permanent part of the equipment for good agriculture, and the kinds of machines are legion. The principles that are involved in the construction of farm machinery, and the practice, can not be adequately discussed in most colleges of mechanic arts or engineering, for such colleges have another and special point of view.

Rural engineering.—Under this term are included such field engineering problems as have to do specially with agricultural enterprises, as surveying with reference to land measure, drainage, irrigation, road making, water supplies, and many of the lesser problems of bridge building, traction development, and other construction.

Nearly all the land of the open country is to be in farms (using the word farm to include organized and managed forests), and the complete utilization

of this land will demand the expenditure of much engineering skill. The engineer will probably contribute as much as any other man to the making of the ideal country life. Professional engineering problems must be left to the technical engineering schools, but training must also be provided from the agricultural point of view and in connection with other agricultural studies. These agricultural engineering subjects are bound to multiply. Irrigation, for example, is not to be confined to arid regions; it must be added to humid regions, not only to overcome the effect of drought, but to cause the land to produce to its utmost. Irrigation for humid climates presents a special set of problems, for it must be intimately associated with drainage, and these problems are not yet well understood.

Rural art.—Almost from the first, agricultural colleges have included landscape gardening in their curricula. In fact, they are the only institutions that have taught it. The subject is considered to be their special province. To this day there is only one professional school in the United States covering this field, and that was recently organized at Harvard. At least 22 of the land-grant institutions are now giving instructions in these subjects.

As a country life and agricultural subject, landscape gardening (or landscape architecture) has to do primarily with the making of the farm property (both the home and the farm) attractive and artistic. In a larger way, it has to do with the preserving and improving of natural scenery, with village improvement, and with the general elevation of taste. The artistic handling of ordinary farm properties must be left largely to the agricultural schools and colleges, because it can not pay sufficient fees to warrant a professional man to undertake it; moreover, the desire for such handling must be aroused and fostered by educating the man who lives on the land. The entire farm area of a college or university should be laid out with reference to good taste, making it practically a rural park without in any way interfering with its agricultural utilization; in fact, such layout should increase its agricultural utility.

Rural architecture.—Rural architecture is for the most part hopelessly inefficient and therefore hopelessly inartistic. Real farm architecture will not be handled by professional architects because there are no fees in it; and, as in the case of rural art in general, the public sense must be quickened. Moreover, the problems in farm architecture are essentially agricultural problems. This is particularly true of barns and stables. Practically all farm buildings must be rebuilt on fundamentally new lines, if farming is to be an efficient business. In the past, barns and stables have been built merely to protect produce and animals, rather than to accomplish certain definite progressive ends. The modern ideas of sanitation, whereby dust is to be eliminated, are revolutionizing stable construction, to say nothing of means to securing cleanliness in other ways, of ventilation, of sunlight, water supplies, and other necessities.

Technology and other manufacture.—Several great departments or other kinds of work will develop in this field. Dairy manufacture has already reached a very high degree of development in several agricultural colleges, and is completely established in the public confidence, although it was a doubtful innovation only a few years ago. This intelligent dairy manufacture has had an immeasurable effect on dairy production and products. Therefore it is not too much to expect that comparable results will follow in other lines of agricultural manufacture, particularly in the making of commercial products and the utilization of waste in the great fruit industries. The technology of canning, evaporating, and preserving of fruit is much in need in the colleges. These institutions must also undertake the whole subject of the curing of meats and the manufacture of animal products. These subjects naturally lead to consideration of storage, refrigeration and the mechanics of transportation.

Domestic and personal questions.—The home as well as the land must be reached. The home questions are of two categories: The internal, comprising housekeeping and householding subjects; the external, in which the home is considered as part of the community in its relation to school, church, organizations, and various social questions. The farm home should be the ideal place in which to train boys and girls. It should be comfortable, attractive, and sanitary. Human food should receive scientific attention. Woman's work should be alleviated and elevated. The work needs reorganization. Mechanical appliances must be brought to its aid. The miscellaneous activities that center about the home have been assembled into courses of study. These courses have received various collective names, none of which is good, because the subjects are miscellaneous and not capable of being welded. Of these names, "home economics" seems now to be the oftenest preferred.

V. STATE APPROPRIATIONS FOR EDUCATIONAL INSTITUTIONS, 1901–1915.

TABLE 45.

[Prepared by University of North Dakota.]

University. (For stations, see below.)		Agricultural College. (For stations, see below.)		Valley City Normal.		Mayville Normal.		Minot Normal.		Industrial School.		
1915—Maintenance and discount appropriation	$87,000 00	Discount on 1914 mill tax	$23,500 00	Maintenance and discount	$53,778 00	Maintenance and discount	$15,000 00	Maintenance and discount appropriation	$17,208 00	Maintenance e	
Library maintenance	5,000 00	Heating mains	15,000 00	Gardens, walks, etc	1,000 00	Improvements and repairs	4,500 00	Dormitory repairs	1,000 00	Finishing gym	
Summer session	5,000 00	Vacuum pumps	600 00	Artesian well	300 00	Grounds	4,000 00	Interest on warrants	2,800 00	Insurance	
Extension work	2,500 00	Extension department	57,667 00	Barn and shed	1,000 00	Model school building	8,172 00		21,008 00		
Audit of accounts	2,500 00	Experimental station	50,000 00	Library	1,500 00	Equipment	10,000 00				
Grounds	5,000 00	Dairy building equipment	3,500 00	Insurance premiums		Insurance premiums	1,064 00				
Repairs	7,500 00	Pure food laws	20,000 00		59,078 00		40,736 00				
Rewiring buildings	4,000 00	Sanitary inspection, etc	24,000 00								
Commons equipment	2,500 00	Serum institute	6,000 00								
Medical school equipment	14,439 95	Milling wheat	1,000 00								
Insurance premiums		Demonstration farm fund									
	137,439 95	Pure seed fund	5,000 00								
			206,167 00								
1913—Maintenance	$40,000 00	Maintenance	$25,000 00	Maintenance	$45,000 00						
General repairs	5,000 00	Agricultural extension	20,000 00	Library	2,500 00						
Library	5,000 00	Repairs	5,000 00	Apparatus and furniture	5,000 00						
Law-school library	3,000 00	Heating mains	1,500 00	Grounds	1,000 00						
Boiler and heating plant for plant house	1,800 00	Dairy and creamery building equipment and model barn	30,000 00	Heat regulation and control	3,500 00						
Grounds	2,500 00	Dairy herd	5,000 00		57,000 00						
Summer session	3,000 00	Enforcement pure food laws	24,000 00								
	65,300 00	Pure seed law	5,000 00								
		Serum institute	6,000 00								
		Milling wheat	1,000 00								
		Farmers' institute	12,000 00								
			134,500 00								
1911—Completing commons building	$27,600 00	Local experiment station	$50,000 00	Industrial arts building	$25,000 00						
Furnishing commons building	5,000 00	Chemistry building	65,000 00	Apparatus and equipment	3,100 00						
Equipment engineering college	17,000 00	Girls' dormitory and domestic science laboratory and equipment and furnishing for same	40,000 00	Repairs	3,000 00						
Maintenance	25,000 00	For the purchase of ½ section of land	15,000 00	Library	1,000 00						
Reimbursement appropriation	24,000 00	Enforcement pure-food laws	24,500 00	Maintenance	45,000 00						
Library	5,000 00	Serum institute	6,000 00	Furnishing new dormitory	7,100 00						
Grounds and campus	2,500 00	Pure seed law	5,000 00	Boilers	8,000 00						
Equipment biology department	5,000 00	Milling wheat	1,000 00		92,100 00						
Furnishing teachers' college	5,000 00	Farmers' institute	12,000 00								
Equipment school of mines	1,100 00		218,000 00								
Equipment school of mines	9,000 00										
Equipment chemistry department	2,500 00										
Summer session	3,000 00										
Extension lectures and courses	3,500 00										
	137,300 00										
1909—Repairs science hall	$3,000 00	Veterinary laboratory and barn	$30,000 00	Heating plant and equipment	$40,000 00	Completing and furnishing new dormitory	$25,000 00	Maintenance	$25,000 00	Maintenanc	
Teachers' college building	60,000 00	Equipment engineering college	12,000 00	Maintenance	40,000 00	Changing heating system to vacuum system	3,000 00	Power plant and electric-light equipment	11,500 00	Girls' dorm	
Equipment mechanical engineering	5,000 00	Cement walk	3,000 00	Completing auditorium	5,000 00	Separate heating plant	15,000 00	Target practice	200 00	Chemistry	
Commons building	40,000 00	Girls' dormitory and domestic science building	75,000 00	Mortgage on dormitory property	2,375 00	Gymnasium apparatus	500 00		36,800 00	Heating pla	
Book stacks for library	3,000 00	Dynamo and equipment for power plant	10,000 00	Library	1,000 00	Manual training and domestic science apparatus	500 00			Ventilation	
Moving and repairing power plant	20,000 00	Wheat experiments	5,000 00	Furniture for auditorium	1,500 00		56,500 00			Furniture	
Grounds and campus	5,000 00	Serum institute	6,000 00	Apparatus, museum equipment, and cabinet	2,000 00	Furniture and fixtures for main building	1,500 00			Cement wal	
Maintenance	10,000 00	Pure seed law	5,000 00	Main building of a ladies' dormitory	50,000 00					Grading an	
Library	5,000 00	Milling wheat	1,000 00		133,875 00					Equipmen	
	151,000 00	Enforcement pure food laws	20,000 00							Equipmen	
		Farmers' institute	12,000 00								
			179,000 00								
1907—Sewer system	$10,000 00	Greenhouse	$6,000 00	Building for assembly room, class rooms, and library	$40,000 00	Completing building	$15,000 00	Dormitory	$25,000 00	Purchasin	
Combined armory, assembly hall, and gymnasium	25,000 00	Enlargement of drill hall	6,500 00	Deficit	3,313 00	Repairing old building	5,000 00	Repairs	2,500 00	erty	
School of mines building	20,000 00	Shed for farm machinery	2,000 00	Furniture	1,000 00	Shed for storing fuel	1,000 00	Mechanical and industrial arts	2,000 00	Payment	
Library	1,000 00	Root cellar and seed house	10,000 00	Repairing floors	1,000 00	Ground	1,000 00	Library	1,000 00	Sewer asse	
Repairs to young women's dormitories	10,000 00	Repairing main building, roof for Francis Hall, and miscellaneous repairs	12,500 00	Repairing roof, painting, and other repairs	2,000 00	Equipment for laboratories	2,500 00	Grounds	500 00	Repairs	
Repairs to main building	18,235 00	Milling wheat	1,000 00	Grounds	500 00	Library	1,000 00	Interest on certificates of indebtedness	2,800 00	Equipmen	
	84,235 00	Enforcement pure food laws	20,000 00	Library	1,000 00	Women's dormitory	20,000 00		33,800 00	Library	
		Construction and equipment engineering building and for making improvements in laboratories and shops	65,000 00	Walks	500 00	Deficit	8,000 00				
		Farmers' institute	12,000 00	Maintenance	8,000 00		54,500 00				
			135,000 00		57,813 00						
1905—Law library	$10,000 00	Indebtedness	$30,400 00	Sewer and connections	$945 00	Repairing and addition to present building and heating plant	$25,000 00	Maintenance	$33,600 00	Maintena	
Indebtedness	68,000 00	Chemical laboratory and greenhouse equipment	50,000 00	Closets and plumbing	1,000 00	Dormitory	20,000 00	Materials and furnishings	3,000 00		
		Enforcement pure food laws	6,000 00	Artesian well	1,250 00		45,000 00	Repairs	2,500 00		
			12,000 00	Real estate	2,000 00			Grounds	500 00		
				Medical school building	35,000 00			Library	1,000 00		
								Sewerage	1,000 00		

NS.

SUMMARY OF TOTAL APPROPRIATIONS.

ge.		University.	Agricultural College.	Valley City Normal.	Mayville Normal.	Industrial School.	State School of	School of

1905—Law library	$10,000.00	Indebtedness	$20,400.00	Sewer and connections	$945.00
Indebtedness	68,000.00	Chemical laboratory and greenhouse equipment	50,000.00	Closets and plumbing	1,000.00
	78,000.00	Enforcement pure food laws	6,000.00	Artesian well	1,250.00
		Farmers' institute	12,000.00	Real estate	2,000.00
		State dipping tanks	7,000.00	Model school building	35,000.00
			105,400.00	Furniture for above building and dormitory	2,500.00
				Indebtedness	38,000.00
					80,695.00
1903		Pure food law	$3,000.00		
		Farmers' institute	8,000.00		
			11,000.00		
1901—Two-fifths of 1 mill tax for educational institutions.		Maintenance (one-fifth of 1 mill tax for educational institutions).	$18,000.00	Maintenance (twelve one-hundredths of 1 mill tax for educational institutions).	$15,000.00
		Farmers' institute	6,000.00		
			24,000.00		

Repairing and addition to present building and heating plant	$25,000.00	Maintenance	$33,600.00
Dormitory	20,000.00	Materials and furnishing	3,000.00
	45,000.00	Repairs	2,500.00
		Grounds	500.00
		Library	1,000.00
		Sewerage	1,000.00
		Armory and gymnasium and equipment for same	5,000.00
		Interest on certificate of indebtedness	2,800.00
			49,400.00
		Maintenance and improvements	$24,000.00
Maintenance (twelve one-hundredths of 1 mill tax for educational institutions).	$15,000.00	Maintenance	$14,000.00

STATIONS.

University.		Agricultural college.		University.	
1815—Biological station:		Experiment stations:		**1909**—Biological station	$5,000.00
Maintenance	$5,000.00	Edgeley	$10,000.00	Geological survey	2,000.00
Equipment, etc., for handling fish	1,830.00	Dickinson	10,000.00	Mining station	30,000.00
	$7,830.00	Langdon	10,000.00	Public-health laboratory	10,000.00
Geological survey	2,000.00	Willist n	10,000.00	Biological station building	5,000.00
Mining station:		Hettinger	10,000.00		53,000.00
Maintenance	16,000.00	Special live-stock work	10,000.00		
Deficit caused by fire	13,000.00	Geological survey	2,000.00		
	29,000.00		62,000.00		
Public-health laboratory	10,840.00	Demonstration farms	21,000.00		
	58,670.00		83,000.00		
1913—Biological station	$6,000.00	Experimental stations:		**1907**—Geological survey	$2,000.00
Geological survey	2,000.00	Dickinson	$10,000.00	Public-health laboratory	10,000.00
Mining station:		Edgeley	10,000.00	Public-health laboratory equipment	2,000.00
Maintenance	$12,500.00	Hettinger	10,000.00		14,000.00
Building	5,033.00	Langdon	10,000.00		
	17,500.00	Williston	10,000.00		
Public-health laboratory	20,000.00	Demonstration farms	21,000.00		
	45,500.00		71,000.00		
1911—Biological station	$6,000.00	Experiment stations:		**1905**—Geological survey	$2,000.00
Geological survey	2,000.00	Dickinson	$10,000.00		
Mining station	25,000.00	Dickinson, improvement	3,000.00		
Public-health laboratory	20,000.00		13,000.00		
	53,000.00	Edgeley	10,000.00		
		Edgeley, improvements	1,750.00		
			11,750.00		
		Hettinger, improvement	2,350.00		
		Langdon	$10,000.00	**1903**—Geological survey	$2,000.00
		Langdon, improvements	3,500.00		
			13,500.00		
		Williston	10,000.00		
		Williston, improvements	5,000.00		
			15,000.00		
		Geological survey	2,000.00	**1901**—Geological survey	$1,000.00
		Demonstration farms	21,000.00		
			81,600.00		

SUMMARY OF LOCAL AND STATION APPROPRIATIONS.

	University.			Agricultural college.		
	Local.	Stations.	Total.	Local.	Stations.	Total.
1915	$137,459.90	$48,670.00	$186,129.90	$206,167.00	$86,000.00	$292,167.00
1913	65,300.00	45,500.00	110,800.00	134,500.00	74,000.00	208,500.00
1911	135,200.00	53,000.00	188,200.00	218,000.00	81,600.00	299,600.00
1909	151,000.00	53,000.00	204,000.00	179,000.00	85,500.00	264,500.00
1907	84,235.00	14,000.00	98,235.00	255,000.00	65,775.00	320,775.00
1905	78,000.00	2,000.00	80,000.00	105,400.06	22,000.00	127,400.00
1903		2,000.00	2,000.00	11,000.00	12,000.00	23,000.00
1901		1,000.00	1,000.00	24,000.00	1,000.00	25,000.00
Total	651,194.90	219,170.00	870,364.90	1,013,067.00	427,875.00	1,440,942.00

SUMMARY OF TOTAL APPROPRIATIONS.

	University.	Agricultural College.	Valley City Normal.	Mayville Normal.	Industrial School.	State School of Science.	School of Forestry.	N
1915	$186,129.90	$292,167.00	$49,078.00		$21,008.00	$27,512.00	$28,691.00	$
1913	110,800.00	208,500.00	57,000.00		23,300.00	28,985.12	12,500.00	
1911	188,200.00	299,600.00	92,100.00	$11,889.00	35,500.00	31,250.00	12,000.00	
1909	204,000.00	264,500.00	133,875.00	56,500.00	36,800.00	59,700.00	20,000.00	
1907	98,235.00	320,775.00	57,563.00	53,500.00	33,800.00	32,600.00	25,000.00	
1905	80,000.00	127,400.00	80,685.00	45,000.00	49,400.00	7,000.00		
1903	2,000.00	23,000.00			24,000.00			
1901	1,000.00	25,000.00	15,000.00	15,000.00	14,000.00			
Total	870,364.90	1,440,942.00	495,311.00	201,889.00	237,808.00	187,047.12	98,191.00	

V. STATE APPROPRIATIONS FOR EDUCATIONAL INSTITUTIONS, 1901–1915.

TABLE 45.

[Prepared by University of North Dakota.]

Valley City Normal.		Mayville Normal.		Industrial School.		State School of Science.		School of Forestry.	
nce and discount	$53,778.00	*Minot Normal.*		Maintenance and discount appropriation	$17,208.00	Maintenance and discount appropriation	$12,147.00	Maintenance and discount appropriation	$18,500.00
walks, etc	1,000.00			Dormitory repairs	1,000.00	Finishing gymnasium	15,000.00	Walks, trees	875.00
well	300.00	Maintenance and discount	$15,000.00	Interest on warrants	2,800.00	Insurance	365.00	Equipment for departments	300.00
shed	1,000.00	Improvements and repairs	2,500.00		21,008.00		27,512.00	Purchase of 160 acres land	8,000.00
	1,500.00	Grounds	4,000.00					Team and wagon	500.00
premiums	1,500.00	Model school building	8,172.00					Miscellaneous supplies	519.00
	59,078.00	Equipment	10,000.00						28,694.00
		Insurance premiums	1,064.00						
			40,736.00						
nce	$45,000.00	*Minot Normal.*		Salaries	$17,000.00	Deficit	$18,985.12	Maintenance and experimental work	$12,500.00
	2,500.00			Farm engineering	1,500.00	Maintenance	10,000.00		
ks and furniture	5,000.00	Main building equipment	$20,000.00	Equipment science department	3,000.00		28,985.12		
	1,000.00	Dormitory and equipment	30,000.00	Library equipment	1,000.00				
ilation and control	3,500.00		50,000.00	Interest on Carnegie warrants	2,800.00				
	57,000.00				23,300.00				
al arts building	$25,000.00	*Mayville Normal.*		Maintenance	$20,000.00	Cement walks	$1,800.00	Maintenance and experimental work	$12,000.00
ks and equipment	3,000.00	Student hospital	$10,000.00	Interest	3,500.00	Grounds	1,000.00		
	3,000.00	Reimbursement	9,399.00	Manual training equipment	12,000.00	Reimbursement appropriation	4,950.00		
	1,000.00	Cellar and fuel bin	3,000.00		35,500.00	Repairs	2,500.00		
nance	45,000.00	Ventilating system	4,000.00			Assembly hall and gymnasium	20,000.00		
ing new dormitory	7,100.00	Library	1,000.00	*Minot Normal.*			31,250.00		
	8,000.00	Manual training and domestic science	1,000.00	Main building	$125,000.00				
	92,100.00	Lecture courses	500.00	Wiring and plumbing	5,000.00				
		Boiler	3,000.00	Heating plant	12,000.00				
			51,899.00	Maintenance sewer and water mains	3,000.00				
				Girls' dormitory	50,000.00				
				Maintenance	5,000.00				
					220,000.00				
plant and equipment	$50,000.00	Completing and furnishing new dormitory	$25,000.00	Maintenance	$25,000.00	Maintenance	$2,200.00	Finishing and furnishing assembly room and class rooms	$8,000.00
nance	40,000.00	Changing heating system to vacuum system	3,000.00	Power plant and electric-light equipment	11,500.00	Girls' dormitory, fireproof	55,000.00	Library books and laboratory apparatus	1,500.00
ing auditorium	7,000.00	Separate heating plant	15,000.00	Target practice	300.00	Chemistry building, fireproof	8,500.00	Greenhouse	3,000.00
s on dormitory property	2,375.00	Gymnasium apparatus	500.00		36,800.00	Heating plant	7,500.00	Grounds	1,500.00
	1,000.00	Manual training and domestic science apparatus	500.00			Ventilation, wiring, and repairs	1,500.00	Maintenance	6,000.00
e for auditorium	1,500.00	Furniture and fixtures for main building	1,500.00			Furniture for dormitory	1,500.00		20,000.00
n, museum equipment, and cabinets	2,000.00		56,500.00			Cement walks	700.00		
lding of a ladies' dormitory	50,000.00					Grading and draining	500.00		
	153,875.00					Equipment for dining room and kitchen	800.00		
						Equipment science laboratories	1,200.00		
							59,700.00		
for assembly room, class rooms, and	$40,000.00	Completing building	$15,000.00	Dormitory	$25,000.00	Purchasing Red River Valley University property	$17,000.00	Building and greenhouse and equipment for same	$25,000.00
	3,313.00	Repairing old building	5,000.00	Repairs	2,500.00	Payment of loan	5,100.00		
e	1,000.00	Shed for storing fuel	1,000.00	Mechanical and industrial arts	2,000.00	Sewer assessment	5,000.00		
g floor	1,000.00	Grounds	1,000.00	Library	1,000.00	Repairs	2,500.00		
g roof, painting, and other repairs	2,900.00	Equipment for laboratories	2,500.00	Grounds	500.00	Equipment and furniture	2,000.00		
	500.00	Library	1,000.00	Interest on certificates of indebtedness	2,800.00	Library	1,000.00		
	1,000.00	Women's dormitory	20,000.00		33,800.00		32,600.00		
	750.00	Deficit	8,000.00						
nance	8,000.00		57,500.00						
	57,563.00								
d connections	$145.00	Repairing and addition to present building and heating plant	$25,000.00	Maintenance	$43,000.00	Maintenance	$7,000.00		
nd plumbing	1,000.00	Dormitory	20,000.00	Materials and furnishing	3,000.00				
well	1,250.00		45,000.00	Repairs	2,500.00				
te	2,000.00			Grounds	500.00				
hool building	35,000.00			Library	1,000.00				
	3,500.00			Sewerage	1,000.00				

... $20,400.00 ...nt 50,000.00 .... 6,000.00 .... 12,000.00 .... 7,000.00 105,400.00	Sewer and connections ... $945.00 Closets and plumbing ... 1,000.00 Artesian well ... 1,250.00 Real estate ... 2,000.00 Model school building ... 35,000.00 Furniture for above building and dormitory ... 2,500.00 Indebtedness ... 38,000.00 80,695.00	Repairing and addition to present building and heating plant. $25,000.00 Dormitory ... 20,000.00 45,000.00	Maintenance ... $33,600.00 Materials and furnishings ... 3,000.00 Repairs ... 2,500.00 Grounds ... 500.00 Library ... 1,000.00 Sewerage ... 1,000.00 Armory and gymnasium and equipment for same. 5,000.00 Interest on certificates of indebtedness ... 2,800.00 49,400.00	Maintenance ... $7,000.00
.... $3,000.00 .... 8,000.00 11,000.00			Maintenance and improvement ... $24,000.00	
...duca- $18,000.00 .... 6,000.00 24,000.00	Maintenance (twelve one-hundredths of 1 mill tax for educational institutions). $15,000.00	Maintenance (twelve one-hundredths of 1 mill tax for educational institutions). $15,000.00	Maintenance ... $14,000.00	Three one-hundredths of 1 mill tax for educational institutions.

STATIONS.

Agricultural college.			University.		Agricultural college.		
Experiment stations:			1909—Biological station	$6,000.00	Experiment stations:		
Edgeley		$10,000.00	Geological survey	2,000.00	Dickinson	$10,000.00	
Dickinson		10,000.00	Mining station	30,000.00	Dickinson, improvements	3,500.00	
Langdon		10,000.00	Public-health laboratory	10,000.00			$13,500.00
Williston		10,000.00	Biological station building	5,000.00	Edgeley	10,000.00	
Hettinger		10,000.00		53,000.00	Edgeley, improvements	2,500.00	
Special live-stock work		10,000.00					12,500.00
Geological survey		2,000.00			Hettinger		10,000.00
		62,000.00			Langdon		10,000.00
Demonstration farms		24,000.00			Williston	$10,000.00	
		86,000.00			Williston, improvements	3,500.00	
							13,500.00
					Geological survey		2,000.00
					Demonstration farms		24,000.00
							85,500.00
Experimental stations:			1907—Geological survey	$2,000.00	Experimental stations:		
Dickinson		$10,000.00	Public-health laboratory	10,000.00	Dickinson		$14,275.00
Edgeley		10,000.00	Public-health laboratory equipment	2,000.00	Edgeley	$10,000.00	
Hettinger		10,000.00		14,000.00	Edgeley improvements	4,500.00	
Langdon		10,000.00					14,500.00
Williston		10,000.00			Langdon		10,000.00
Demonstration farms		24,000.00			Williston		10,000.00
		74,000.00			Geological survey		2,000.00
					Demonstration farms		15,000.00
							65,775.00
Experiment stations:			1905—Geological survey	$2,000.00	Experiment stations:		
Dickinson	$10,000.00				Dickinson		$10,000.00
Dickinson, improvements	3,000.00				Edgeley		10,000.00
		$13,000.00			Geological survey		2,000.00
Edgeley	10,000.00						22,000.00
Edgeley, improvements	1,750.00						
		11,750.00					
Hettinger, improvements		2,350.00	1903—Geological survey	$2,000.00	Edgeley experiment station		$10,000.00
Langdon	$10,000.00				Geological survey		2,000.00
Langdon, improvements	3,500.00						12,000.00
		13,500.00					
Williston	10,000.00						
Williston, improvements	5,000.00						
		15,000.00					
Geological survey		2,000.00	1901—Geological survey	$1,000.00	Geological survey		$1,000.00
Demonstration farms		24,000.00					
		81,600.90					

...UMMARY OF LOCAL AND STATION APPROPRIATIONS.

	University.			Agricultural college.		
	Local.	Stations.	Total.	Local.	Stations.	Total.
...	$137,459.90	$48,670.00	$186,129.90	$206,167.00	$86,000.00	$292,167.00
...	65,300.00	45,500.00	110,800.00	134,500.00	74,000.00	208,500.00
...	135,200.00	53,000.00	188,200.00	218,000.00	81,600.00	299,600.00
...	151,000.00	53,000.00	204,000.00	179,000.00	85,500.00	264,500.00
...	84,235.00	14,000.00	98,235.00	135,000.00	65,775.00	200,775.00
...	78,000.00	2,000.00	80,000.00	105,400.00	22,000.00	127,400.00
...	...	2,000.00	2,000.00	11,000.00	12,000.00	23,000.00
...	...	1,000.00	1,000.00	24,000.00	1,000.00	25,000.00
...al	651,194.90	219,170.00	870,364.90	1,013,067.00	427,875.00	1,440,942.00

SUMMARY OF TOTAL APPROPRIATIONS.

	University.	Agricultural College.	Valley City Normal.	Mayville Normal.	Industrial School.	State School of Science.	School of Forestry.	Minot Normal.
1915	$186,129.90	$292,167.00	$59,078.00	...	$21,008.00	$27,512.00	$28,694.00	$40,736.00
1913	110,800.00	208,500.00	57,000.00	...	23,300.00	28,985.12	12,500.00	50,000.00
1911	188,200.00	299,600.00	92,100.00	$31,899.00	35,500.00	31,250.00	12,000.00	200,000.00
1909	204,000.00	264,500.00	133,875.00	56,500.00	36,800.00	59,700.00	20,000.00	...
1907	98,235.00	200,775.00	57,563.00	53,500.00	33,800.00	32,600.00	25,000.00	...
1905	80,000.00	127,400.00	80,695.00	45,000.00	49,400.00	7,000.00	...	...
1903	2,000.00	23,000.00	...	...	24,000.00	...	...	...
1901	1,000.00	25,000.00	15,000.00	15,000.00	14,000.00	...	...	...
Total	870,364.90	1,440,942.00	495,311.00	201,899.00	237,808.00	187,047.12	98,194.00	290,736.00

VI. THE UNIVERSITY OF NORTH DAKOTA—EDUCATIONAL SERVICE.

TABLE 46.

[Prepared by University of North Dakota.]

	Fiscal year.					
	1910–11	1911–12	1912–13	1913–14	1914–15	1915–16
Division of engineering:						
School of mines—						
Salaries, instruction	$4,000.00	$5,750.00	$5,950.00	$7,190.00	$7,910.00	$7,960.00
Salaries, clerical	183.71	613.38	293.79	869.47	540.00	540.00
Materials and supplies	738.65	576.72	616.41	1,419.75	1,817.92	1,555.00
Freight and express	97.60	47.29	89.81	201.07	251.56	.....
Assistance by students in analysis and testing	465.79	168.73	148.47	472.10	243.80	470.00
Repairs	.....	.....	22.87	71.79	20.66	.....
Museum	.....	.....	198.35	256.37	.....	.....
Salaries of dean and assistants	400.00	400.00	851.05	1,023.50	1,294.85	1,250.00
Total school of mines	5,885.75	7,556.12	8,170.75	11,534.05	12,078.79	11,775.00
Course in civil engineering—						
Salaries, instruction	.....	.....	.....	.....	2,500.00	2,500.00
Materials and supplies	.....	.....	.....	.....	46.80	125.00
Total course in civil engineering	.....	.....	.....	.....	2,546.80	2,625.00
College of mechanical and electrical engineering—						
Salaries, instruction	9,439.00	10,100.00	10,150.00	9,400.00	9,450.00	10,800.00
Salaries, office and clerical	424.18	30.75	12.50	3.56	.....	.....
Materials and supplies	1,717.51	616.93	530.72	752.94	789.00	750.00
Repairs	31.31	34.70	162.42	10.10	78.16	200.00
Freight and express	72.25	23.27	22.99	72.07	12.96	.....
Salaries of dean and assistants	400.00	400.00	400.00	100.00	400.00	400.00
Total college of mechanical and electrical engineering	12,084.25	11,205.65	11,287.63	10,338.67	10,730.21	12,150.00
College of liberal arts:						
Graduate department	1,230.00	1,655.00	1,793.50	1,520.00	1,600.00	1,350.00
Art and design	.....	.....	.....	.....	1,703.53	2,200.00
Biology	5,257.87	5,187.36	6,060.37	6,487.03	4,150.62	4,240.00
Chemistry	4,460.19	4,644.94	5,242.11	7,369.29	8,344.62	8,300.00
Economics and political science	3,768.75	4,075.00	4,306.37	3,966.35	3,680.00	3,980.00
English	7,300.00	6,227.50	7,370.00	7,900.00	8,112.00	8,325.00
Geology	4,235.47	4,586.16	4,650.31	4,762.93	4,720.93	4,750.00
German	.....	3,100.00	3,400.00	3,400.00	3,700.00	3,975.00
German and Scandinavian	4,100.00	.....	.....	.....	.....	.....
Greek	2,308.15	2,424.84	2,500.00	2,500.00	2,500.00	2,525.00
History	3,965.61	4,027.26	3,216.55	3,761.94	3,655.59	3,710.00
Home economics	.....	.....	.....	.....	1,992.18	2,250.00
Latin	4,704.50	2,200.00	2,525.00	2,400.00	2,400.00	2,420.00
Mathematics and applied mathematics	3,997.16	4,068.29	4,050.78	4,137.29	1,700.00	1,850.00
Music	1,716.38	2,236.83	2,179.76	2,308.01	2,419.61	2,550.00
Physical training	3,966.28	4,404.66	4,299.56	5,465.78	4,792.80	5,375.00
Physics	5,604.49	5,697.36	6,274.16	6,582.65	6,453.51	7,110.00
Romance languages	2,100.00	2,200.00	2,300.00	2,022.28	2,166.88	2,375.00
Scandinavian	.....	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00
Sociology	2,438.06	2,580.87	3,351.13	3,630.54	3,882.89	3,980.00
Convocation lectures	320.50	492.20	401.47	348.09	141.25	400.00
Meteorology	174.06	.....	.....	.....	.....	.....
Museum	.....	1,330.12	306.34	.....	.....	.....
Salaries of dean and assistants	400.00	200.00	400.00	350.00	200.00	200.00
Total college of liberal arts	62,107.58	63,848.39	67,117.40	71,402.03	70,815.82	74,345.00
Law school:						
Salaries, instruction	8,350.00	8,367.50	9,575.00	10,250.00	10,091.25	10,170.00
Salaries, office and clerical	1,166.25	1,168.98	473.13	491.90	761.60	835.00
Materials and supplies	222.49	228.84	309.21	273.79	589.60	750.00
Repairs	25.84	.....	35.68	77.90	40.28	.....
Rent of quarters	1,440.00	1,440.00	1,440.00	1,740.00	1,755.00	2,100.00
Books	418.29	870.82	900.17	2,348.25	1,662.26	500.00
Freight and express	2.58	.....	3.26	9.64	3.66	.....

TABLE 46—Continued.

	Fiscal year.					
	1910–11	1911–12	1912–13	1913–14	1914–15	1915–16
Law school—Continued.						
Traveling expenses		$73.82				
Salaries of dean and assistants	$400.00		$960.00	$990.00	$300.00	$400.00
Total law school	12,025.48	12,149.96	13,716.45	16,181.57	15,203.65	14,755.00
School of education	6,073.06	6,239.49	8,135.29	12,643.96		
Education and philosophy					8,677.12	8,630.00
Professional courses—						
Manual training					450.00	450.00
Commercial branches					600.00	600.00
German					600.00	400.00
English						850.00
History						200.00
Mathematics						800.00
Total	6,073.06	6,239.49	8,135.29	12,643.96	10,327.12	11,930.00
Model high school—						
Salaries, instruction	11,842.00	13,427.50	13,003.41	11,768.30	10,182.50	9,020.00
Materials and supplies	391.33	430.98	609.61	451.37	311.28	365.00
Repairs	4.80			18.00	4.07	
Freight and express	19.56	7.40	20.18	21.34	12.07	
Salaries of dean and assistants	400.00	400.00	400.00	500.00	500.00	400.00
Total school of education	18,730.75	20,509.37	22,168.49	25,402.97	21,338.04	21,715.00
School of medicine:						
Salaries, instruction	2,850.00	4,500.00	4,800.00	4,587.00	4,300.00	4,500.00
Salaries, clerical, etc	14.65	31.25	13.39	37.50	135.00	175.00
Materials and supplies	798.05	721.65	732.49	562.98	700.05	810.00
Repairs	110.88	55.42	16.19	5.99	37.84	
Freight and express	30.61		94.57	55.39	34.85	
Bacteriology and pathology	607.57	780.53	1,148.36	934.90	1,764.32	1,925.00
Nurses' course	800.00	1,146.25	1,072.88	1,054.43	1,109.78	1,100.00
Infirmary and nursery	61.94	77.67				
Salaries of dean and assistants	400.00			200.00	300.00	300.00
Total school of medicine	5,673.70	7,321.77	7,877.88	7,438.17	7,032.74	8,810.00
Summer session (college section):						
Salaries	1,597.58	1,605.00	1,959.00	2,292.50	2,243.33	2,265.00
Materials and supplies	38.20	92.93	61.28	51.37	72.91	25.00
Printing			98.40	135.08	98.60	125.00
Total summer session	1,635.78	1,697.93	2,118.68	2,478.95	2,414.84	2,415.00
Extension division:						
Salaries direction, instruction, and lectures		1,390.92	2,182.50	3,700.44	4,395.59	3,300.00
Salaries, clerical	158.25	688.40	300.00	408.87	284.25	600.00
Materials and supplies	117.15	326.58		161.24	107.69	150.00
Repairs	26.05					
Traveling expenses of faculty lecturers and staff	856.24	1,667.48	2,420.87	1,[illegible]5.33	660.04	1,350.00
Freight and express	22.60			34.74	50.30	
Printing and postage	193.20	539.59	545.42	385.87	830.69	750.00
Stationery and office supplies		232.62	129.61	167.24		
High-school contests			42.00		208.28	150.00
Refunds				49.82	18.00	
Total extension division	1,373.58	4,854.59	5,620.40	6,793.55	6,563.74	6,300.00
Library:						
Salary, librarian	1,250.00	1,108.27	1,500.00	1,600.00	1,650.00	1,700.00
Salaries, clerical	2,238.98	2,555.07	2,776.44	3,158.10	3,385.98	3,210.00
Supplies	600.29	224.22	372.07	497.34	672.98	840.00
Freight and express	172.93	182.59	204.67	96.18	85.34	100.00
Books and periodicals	3,124.63	3,387.11	3,996.73	3,556.60	2,095.17	2,700.00
Total library	7,386.83	7,457.26	8,849.91	8,908.22	7,889.47	8,550.00
Total educational service	126,903.70	136,597.04	146,927.59	160,478.18	156,613.10	163,440.00

VII. UNIVERSITY PLANT.

TABLE 47.

Buildings.	Date built.	Cost.	Equipment.	Use.
Merrifield Hall	1883	$71,597.05	$9,575.00	Administration and recitations.
Davis Hall	1887	40,000.00	5,540.43	Women's dormitory.
Macnie Hall	1893	16,000.00	1,986.87	Do.
Budge Hall	1899	27,000.00	1,905.50	Men's dormitory.
Science Hall	1901	47,000.00	30,099.15	Geology, biology, medicine, health, etc.
Mechanical engineering building	1902	25,000.00	34,092.50	College of mechanical and electrical engineering.
President's residence	1902	25,000.00	898.25	
Library (gift of Andrew Carnegie).	1907	30,000.00	[1] 57,768.50 [2] 7,232.66	
Gymnasium	1907	28,000.00	1,201.00	Physical education.
Mining engineering building	1909–10	32,500.00	35,835.45	
Woodworth Hall	1909–10	68,000.00	14,923.13	School of education; physical education for women; music.
School of law (rented quarters in city).			[1] 27,375.50 [2] 1,531.37	
University Commons Building	1910–1912	70,000.00	7,425.23	Dining hall.
Power plant	1909	8,500.00	15,644.90	
Plant house	1912–13	6,500.00		Green house.
Biological station building (Devils Lake).	1910	5,000.00	2,291.10	Biological research.
Mining station buildings (at Hebron).[3]		6,050.00	13,900.00	
Barn and carriage shed		1,900.00	2,703.20	
Carpenter shop, ice house, etc		550.00		
Public health laboratory (branches at Bismarck and Minot).			689.80	
Total		508,597.05	272,009.54	

[1] Library. [2] Furniture.
[3] Office and laboratory, briqueting building; power and gas house, coal sheds, etc.

Campus, 80 acres (40 acres adjoining), with improvements worth $62,408.80.

SUMMARY.

College of liberal arts	$37,252.13	
School of education and model high school	10,949.89	
School of law	28,906.87	
School of mines	22,005.00	
School of medicine	4,394.03	
College of mechanical and electrical engineering	34,092.50	
Courses in civil engineering	1,836.00	
Total colleges		$139,436.42
Library	64,401.16	
Administrative offices	5,780.10	
Dormitories, president's residence, and commons	16,754.55	
Substations	13,258.00	
Museum	7,024.00	
Barn, power plant, mechanician, and weather bureau	20,414.71	
		184,603.42

SUMMARY OF LANDS, BUILDINGS, AND EQUIPMENT.

Estimated value of campus, 80 acres, and 40 acres adjoining		$50,000.00
Campus improvements		62,408.80
Buildings, book value		508,597.05
Furniture, apparatus, and equipment		187,725.54
Libraries (books)		84,344.00
Land endowment:		
Funds invested	$1,163,019.78	
36,511.15 acres of unsold lands, estimated at $15 per acre	547,667.25	
		1,710,687.03
Total		2,603,762.42

VIII. ITEMIZED STATEMENT OF INCOME OF THE UNIVERSITY, 1915–16.

TABLE 48.

INCOME—EDUCATIONAL.

Student fees	$22,150.00	
Mill tax, uncollected	4,000.00	
Mill tax, fixed sum	102,720.00	
Maintenance appropriation	25,500.00	
Reimbursement appropriation	36,000.00	
Appropriations for library, grounds, repairs, and summer session	7,750.00	
Interest and income	60,000.00	
Extension division:		
Appropriation	2,500.00	
Correspondence students	650.00	
Lectures	1,250.00	
Lyceum fees, net	1,250.00	
Office of high-school examiner	900.00	
Interest on bank balances	240.00	
Miscellaneous receipts that reduce operating costs	5,850.00	
		$270,760.00

INCOME—NONEDUCATIONAL.

Appropriations for audit of accounts	2,500.00	
Insurance premiums and interest	13,459.95	
Commons equipment	4,000.00	
Medical-school equipment	1,250.00	
Re-wiring buildings	7,500.00	
		28,709.95
Stations:		
Mining substation	11,000.00	
Biological station	3,678.00	
Public-health laboratory	12,340.00	
Geological survey	616.00	
		27,634.00
Dormitory rents	8,925.00	
University commons	54,850.00	
State oil inspection	3,000.00	
Athletic association (fees)	2,800.00	
County summer school	1,925.00	
Miscellaneous trust funds	2,139.60	
		73,639.60
		400,743.55

IX. BUILDINGS, EQUIPMENT, AND INCOME OF NORTH DAKOTA AGRICULTURAL COLLEGE.

TABLE 49.—*Buildings.*

Buildings.	Date of erection.	Construction.	Cost or estimate.	Uses.
Administration	[1]1891	Brick	$34,000.00	Offices and classrooms, country theater.
Chemical	1910	Brick and concrete, fireproof.	110,000.00	Department chemistry and pharmacy, pure food laboratories.
Engineering	1907	Brick	59,000.00	Department engineering.
Mechanical Arts	1893	....do	28,000.00	Shops.
Science Hall	1901	....do	26,000.00	Department biology and pure seed laboratory.
Francis Hall	1893	....do	20,000.00	Department agriculture and horticulture.
Veterinary	1909	....do	28,000.00	Department veterinary and State serum institute.
Dairy	1913	Brick and concrete fireproof.	27,000.00	Department dairying and laboratories.
Music Hall	1897	Brick	3,700.00	Department music.
Ceres Hall	1909	....do	110,000.00	Department home economics and girls' dormitory.
Armory	[1]1897	Frame	10,509.00	Department military drill and convocation hall.
Library	1905	Brick	22,000.00	Department library.
Experimental mill	1907	Frame	4,400.00	Experimental work in grains and flours.
Seed house	1907	Brick	9,500.00	Storage of grains and seed laboratory.
Greenhouse	[1]1907	Brick walls	6,000.00	Greenhouse, garden and plants laboratory.
Farmhouse	1893	Frame	4,000.00	Residence farm superintendent and farm laborers.
Horse barn	1901	....do	10,200.00	Horses.
Cow barn	1901	....do	8,800.00	Cattle.
Sheep barn	1899	....do	3,000.00	Sheep.
Swine barn	1899	....do	1,500.00	Swine.
Dairy barn	1913	Concrete, frame roof.	110,500.00	Dairy cattle.
Milk house	1915	Concrete	1,500.00	For care of milk.
Poultry house No. 1	1895	Frame	1,800.00	Poultry.
Poultry house No. 2	1895	....do	280.00	Do.
Machine shed No. 1	1907	....do	2,200.00	Storage machinery.
Machine shed No. 2	1990	....do	1,000.00	Do.
Garden house	1898	....do	220.00	Storage of garden tools.
Serum buildings (5)	1909-15	....do	1,200.00	Manufacture of serum, and serum hog sheds.
Heating plant	[2]1908	Brick	10,500.00	Central heating plant for all buildings.
Total			554,809.00	

[1] Remodeled 1907. [2] Addition 1913. [3] Remodeled.

TABLE 50.—*Approximate value of equipment by departments.*

Department.	Equipment.	Department.	Equipment.
Agriculture	$74,360.00	Modern languages	$150.00
Engineering	45,000.00	Military	125.00
Biology	40,630.00	High school	130.00
Chemistry	33,700.00	Athletics	530.00
Veterinary	26,240.00	President	720.00
Home economics	7,000.00	Registrar	1,170.00
Music	2,850.00	Secretary	1,535.00
Public discussion	2,500.00	Janitor	1,980.00
Horticulture	1,275.00	Director	2,700.00
Mathematics	285.00	Power house	35,280.00
Education	260.00	Library	37,990.00
English	150.00		
History	150.00	Total	315,730.00

TABLE 51.—*Statement of income, July 1, 1914, to June 30, 1915, inclusive.*

Name of fund.	Total.	United States.	State.	Local receipts.
United States Government	$80,000.00	$80,000.00		
Interest and income	59,830.81		$59,830.81	
Mill tax	42,811.29		42,811.29	
Building	5,501.74			5,501.74
Miscellaneous and farm	19,942.73			19,942.73
Ceres Hall	[1] 18,326.47			18,326.47
Hatch	15,000.00	15,000.00		
Adams	15,000.00	15,000.00		
Smith Lever (United States)	10,000.00	10,000.00		
Extension	10,353.70		10,000.00	353.70
Maintenance	33,162.50		25,000.00	8,162.50
Smith Lever (State), available July 1, 1915				
Pure food	10,000.00		10,000.00	
Beverage	12,000.00		12,000.00	
Demonstration farms	12,295.13		12,000.00	295.13
Serum Institute	8,139.94		3,000.00	5,139.94
Pure seed	2,500.00		2,500.00	
Geological survey	1,000.00		1,000.00	
Mill maintenance	1,730.56		500.00	1,230.56
Development and research	15,148.37			15,148.37
Miscellaneous	38,449.99			38,449.99
Local income	16,096.90			16,096.90
Edgeley substation	5,604.53		5,000.00	604.53
Dickinson substation	5,727.96		5,000.00	727.96
Williston substation	8,508.35		5,000.00	3,508.35
Langdon substation	5,978.30		5,000.00	978.30
Hettinger substation	6,184.18		5,000.00	1,184.18
Total	429,382.45	90,000.00	203,642.10	135,740.35

[1] The income from Ceres Hall, $18,326.47, is not net and should be deducted from "Total," leaving $411,055.98.

X. PUBLIC SCHOOL TEACHERS IN NORTH DAKOTA.

TABLE 52.—*Number of teachers of specified ages of total of 4,981 teachers replying to questionnaire.*

	Less than 18	18	19	20	21	22	23	24	25	26
Ungraded schools	1	61	301	460	413	393	279	249	127	133
Graded elementary schools		3	18	53	98	114	123	149	94	101
High schools				1	10	10	28	42	31	42
Superintendents, principals, and supervisors			1	3	9	22	33	42	31	39
Total	1	64	320	517	530	539	463	482	283	315

	27	28	29	30	31	32	33	34	35	36
Ungraded schools	105	68	53	60	39	31	20	27	19	10
Graded elementary schools	78	60	43	59	31	25	20	11	17	12
High schools	20	23	16	12	6	11	8	1	6	3
Superintendents, principals, and supervisors	29	26	26	34	21	22	25	16	19	14
Total	235	177	138	165	97	89	73	55	61	39

	37	38	39	40	41	42	43	44	45	46
Ungraded schools	10	13	8	7	13	10	7	7	5	9
Graded elementary schools	8	7	9	13	4	5	4	8	1	6
High schools		2	1	1		2			3	
Superintendents, principals, and supervisors	10	10	5	13	5	5	3	3	1	4
Total	28	32	23	34	22	22	14	18	10	19

TABLE 52.—*Number of teachers of specified ages of total of 4,981 teachers replying, to questionnaire*—Continued.

	47	48	49	50	51	52	53	54	55	56
Ungraded schools	7	5	7	2	3	6	2	2	1	2
Graded elementary schools	1	1	1	3	2	2	2	1	1	.....
High schools	1	3	.....	.....	.....	.....	1	.....	.....	.....
Superintendents, principals, and supervisors	2	7	5	4	1	2	4	2	2	1
Total	11	16	13	9	6	10	9	5	4	3

	57	58	59	60	61	62	63	64	65	66
Ungraded schools	1	.....	.....	2	1	2	1	3	.....	.....
Graded elementary schools	.....	1	.....	1	1	.....	.....	.....	.....	1
Superintendents, principals, and supervisors	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Total	2	1	.....	3	2	2	1	3	.....	2

	67	68	70	81	Not reporting.	Totals.
Ungraded schools	1	1	.....	.....	4	2,994
Graded elementary schools	1	.....	.....	.....	4	1,192
High schools	.....	.....	.....	.....	1	285
Superintendents, principals, and supervisors	.....	1	.....	.....	1	510
Total	2	2	.....	.....	10	4,981

TABLE 53.—*Number of teachers who have taught specified number of years of total of 4,981 teachers replying to questionnaire.*

	Less than 1 year.	1	2	3	4	5	6	7	8
Ungraded schools	943	483	445	328	231	132	98	60	56
Graded elementary schools	140	112	161	149	121	100	98	50	60
High schools	42	47	42	36	27	24	25	8	7
Superintendents, supervisors, and principals	31	37	54	57	40	40	41	26	23
Total	1,156	679	702	570	419	296	262	144	144

	9	10	11	12	13	14	15	16	17
Ungraded schools	38	39	17	21	16	10	12	6	2
Graded elementary schools	48	28	27	18	16	8	10	5	8
High schools	5	5	5	3	2	1	1	1	2
Superintendents, supervisors, and principals	21	24	11	15	7	10	8	5	12
Total	112	96	60	57	41	29	31	17	24

	18	19	20	21	22	23	24	25	26
Ungraded schools	13	5	9	2	8	1	4	8	2
Graded elementary schools	4	6	5	3	5	1	3	.....	1
High schools	.....	1	.....	.....	.....	.....	.....	.....	.....
Superintendents, supervisors, and principals	4	4	4	4	4	7	4	3	3
Total	21	16	18	9	16	9	11	11	6

TABLE 53.—*Number of teachers who have taught specified number of years of total of 4,981 teachers replying to questionnaire*—Continued.

	27	28	29	30	31	32	33	34	35
Ungraded schools	2	.....	1	.....	.....	.....	1	.....	1
Graded elementary schools	1	.....	1	.....	.....	1	.....	1	.....
High schools	.....	.....	1	.....	.....	.....	.....	.....	.....
Superintendents, supervisors, and principals	1	.....	1	2	3	1	.....	1	.....
Total	4	.....	4	2	3	2	1	2	1

	36	37	45	47	50	No report.	Totals.
Ungraded schools	.....	3	.....	1	1	.....	2,994
Graded elementary schools	1	.....	.....	.....	.....	.....	1,192
High schools	.....	.....	.....	.....	.....	.....	285
Superintendents, supervisors, and principals	.....	1	1	.....	.....	.....	510
Total	1	4	1	1	1	.....	4,981

TABLE 54.—*Number of teachers who were appointed to their present positions within specified dates, of total of 4,981 teachers replying to questionnaire.*

	Since Jan. 1, 1916.	July 1 to Dec. 31, 1915.	Jan. 1 to June 30, 1915.	July 1 to Dec. 31, 1914.	Jan. 1 to June 30, 1914.	July 1, to Dec. 31, 1913.	Jan. 1 to June 30, 1913.
Ungraded schools	95	2,218	185	155	23	66	13
Graded elementary schools	12	364	289	169	89	66	40
High schools	1	92	63	51	21	15	8
Superintendents, supervisors, and principals	3	133	112	76	44	27	20
Total	111	2,807	649	451	177	174	81

	July 1 to Dec. 31, 1912.	Jan. 1 to June 30, 1912.	July 1 to Dec. 31, 1911.	Jan. 1 to June 30, 1911.	July 1 to Dec. 31, 1910.	Jan. 1 to June 30, 1910.	Jan. 1 to Dec. 31, 1909.
Ungraded schools	31	5	12	.....	5	.....	4
Graded elementary schools	27	5	10	7	15	3	15
High schools	6	3	4	1	4	1	2
Superintendents, supervisors, and principals	24	4	15	8	7	.....	6
Total	88	17	41	16	31	4	27

	Jan. 1 to Dec. 31, 1908.	Jan. 1 to Dec. 31, 1907.	Jan. 1 to Dec. 31, 1906.	Jan. 1 to Dec. 31, 1905.	Jan. 1 to Dec. 31, 1904.	Jan. 1 to Dec. 31, 1903.	Jan. 1 to Dec. 31, 1902.
Ungraded schools	3	3	.....	1	1	.....	1
Graded elementary schools	5	1	4	3	1	1	1
High schools	2	.....	.....	.....	.....	.....	.....
Superintendents, supervisors, and principals	3	4	2	4	1	1	.....
Total	13	8	6	8	3	2	2

TABLE 54.—*Number of teachers who were appointed to their present positions within specified dates, of 4,981 teachers replying to questionnaire*—Con.

	Jan. 1 to Dec. 31, 1901.	Jan. 1 to Dec. 31, 1900.	Jan. 1 to Dec. 31, 1899.	Jan. 1 to Dec. 31, 1898.	Jan. 1 to Dec. 31, 1897.	Jan. 1 to Dec. 31, 1896.	Not reported.	Totals.
Ungraded schools		1					172	2,994
Graded elementary schools				1		2	62	1,192
High schools							11	285
Superintendents, supervisors, and principals			1				5	510
Total		1	1	1		2	250	4,981

XI. COURSES FOR WHICH THERE IS LITTLE DEMAND.

TABLE 55.—*List of courses announced in the catalogue for the second semester, 1915–16, in which no classes were reported for the week of April 10–16, 1916: University of North Dakota.*

Figures following titles of courses indicate number of credit hours.

Since many courses are listed in the university catalogue according to a system of prerequisites rather than by years of the curriculum, it is impracticable to arrange the courses in the following list by years.

Astronomy 2—Practical astronomy, 2.
Bacteriology 2—General bacteriology, 4.
Biology 4—Nature study, 2.
Botany 12—Special morphology of bryophytes and pteridophytes, 4.
14—Special morphology of gymnosperms and angiosperms, 4.
18—Microscopical study of water and sewage, 3.
Ceramics 2—Clay-working laboratory, 4.
Chemistry 12—Water analysis, 1.
Commercial 2—Bookkeeping, 4.
4—Shorthand and typewriting, 4.
6—Advanced bookkeeping and accounting, 4.
8—Stenography, 3.
10—Commercial law, 4.
Economics 8—Tariff history of the United States, 4.
10—History of economic thought, 1.
56—Practical legislation and statutory construction, 2.
Education 6 A—Sociology applied to education, 2.
24—Current educational literature, 2.
104—Theory and practice of teaching history, 2.
106—do., science, 2.
154—do., home economics, 1.
156—do., chemistry, 1.
164—do., art, 1.
166—do., physics, 2.
168—do., botany, 1.
Art and design 12 G—History of Greek art, 2.
Geology 6—Mineralogy, 4.
12—Applied geology, 2.
16—Historical geology, 2.
18—Geological research (hours to be arranged).
20—Climatology (2 or), 4.

German 12—German literature, land, and people, 3.
16—Hauptmann and the modern German writers, 3.
18—Hebbel, 2.
20—Middle high German (can be arranged).
22—Old high German (can be arranged).
Greek 6—Plato and drumatic poetry, 4.
History 6—Constitutional and political history of the United States, 3.
12—Contemporary history, 3.
Latin 12—Roman comedy, 3.
14—Roman life in the first century, 3.
Mathematics 6—Projective geometry, 3.
14—Method of least squares, 2.
Philosophy 6—Experimental psychology, 3.
10—History of modern philosophy, 3.
12—Psychotherapy, 3.
Physics 8—Variable and alternating current measurements, 2.
10—Mathematical physics, 2.
20—Radio communication (hours to be arranged).
22—Physical optics, 4.
French 12—Sixteenth century French, 2.
Spanish 4—Classic Spanish authors of the seventeenth century, 4.
Italian 2—Italian language and literature, 2.
Norse 6—History of Scandinavia, 2.
10—Old Norse, 2.
Mining Engineering 4—Coal mining and handling, 4.
Surveying 10—Railway engineering, 2.
Mechanical Engineering X 34—Mechanical laboratory, 4.
Bridge Design 2—Roof and bridge trusses, 2.
Sanitary Engineering 2—Elements of sanitary engineering, 2.
Mechanical Engineering X 38—Mechanical laboratory, 4.
84—Heating and ventilating, 2.
86—Railroad equipment, 2.
88—Waterworks plants, 2.
90—Mechanical engineering, 4.
100—Mechanical engineering thesis, 2 to 8.
Electrical Engineering 12—Electrical mining machinery, 2.
Municipal Engineering 2—Municipal engineering, 2.
Water Supplies 2—Water supplies, 2.

If all the courses in the foregoing list were offered, there would be required 177 hours additional of instructors' time. At an average of 18.1 hours per week for each instructor (see Table 23, line 2*d*), more than nine additional instructors would be required.

TABLE 56.—*List of courses announced in the catalogue for the spring term, 1915–16, in which no classes were reported for the week of April 10–16, 1916: North Dakota Agricultural College.*

Figures following titles of courses indicate number of credit hours.

SENIOR YEAR.

Agronomy	11	Crop production, 3.
	12	Crop-production laboratory, 2.
Animal Husbandry	13	Animal husbandry seminar, 1.
	15	Animal husbandry elective, 2.
Dairy Husbandry	9	Dairy seminar, 1.
Bacteriology	7	Soil bacteriology, 4.
	8	Sanitary bacteriology—water and sewage, 4.
Chemistry	18	Chemistry of soils, 3.
	20	Dairy chemistry, 3 or 5.
	35	Physical chemistry laboratory, 3.
	31	Technological analysis (hours to be arranged).
Pharmacy	11	Pharmaceutical research, 2.
Mechanical Engineering	6	Machine-shop practice, 3.
	37	Electric machines, 4.
	38	Machine design, 5.
	40	Refrigeration and pneumatic machinery, 5.
Civil Engineering	13	Sewerage, 3.
Architecture	23	Architectural design, 10.
	26	Architectural design, 4.
Geology	6	Special senior geology, 4.
Domestic Science	20	Home nursing, 3.

JUNIOR YEAR.

Zoology	11	Advanced vertebrate embryology, 4.
	14	Economic zoology investigation, 4.
Chemistry	19	Chemistry laboratory investigation, 5.
	14	Elementary physical chemistry laboratory, 4.
Pharmacy	7	Pharmaceutical testing, 2.
Pharmacognosy	2	Study of organic drugs, 4.
Drawing	2 (3)	Freehand drawing, 1.
Geology	5	Practical field methods in geology, 4.
Mineralogy	3	Metallurgy and assaying, 5.
Domestic Art	5	Dressmaking, 2.
German	9 (1)	Advanced prose composition, 2.
	12	Lyric poems, 2.
	15	History of German literature, 2.
French	9	Lyric poems, 2.
	12	Advanced prose composition, 2.
Veterinary Science	4	Veterinary science for agricultural students, 4.

SOPHOMORE YEAR.

Botany	9	Seed analyses and seed testing, 4.
Zoology	7	Animal histology and microscopic anatomy, 4.
Civil Engineering	8	Land surveying, topographic surveying, railroad curves, and earth work, 8.

Architecture 7.....Water color, 1.
Drawing 3.....Freehand drawing—water color, 1.
English 12.....Prose fiction, 4.
Geology 1.....Dynamic, physiographic, and structural geology, 4.
1 (1).....do., advanced, 5.
3.....Economic and applied geology, 5.
Veterinary Science 7.....Animal pathology (hours to be arranged).
16.....Veterinary pharmacy, 4.

FRESHMAN YEAR.

Architecture 1.....Architectural elements, 5.
2.....Water color, 1.
3.....Freehand drawing, 1.
Drawing 3.....Elementary drawing, 2.
2 (1).....Freehand drawing, 1.
German 3.....Reading and composition, 4.

YEAR NOT SPECIFIED.

Mineralogy 4.....Meteorology and climatology, 4.
Horticulture 5.....Plant growth and improvement, 4.
Mathematics 5.....Descriptive astronomy (hours to be arranged).
Public Speaking 4.....Public speaking—debate, 3.

If all the courses in the foregoing list were offered, there would be required 180 hours additional of instructors' time. At an average of 23.2 hours per week for each instructor (see Table 33, line 2*d*), more than seven additional instructors would be required.

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