

REPORT OF THE PRESIDENT  
OF THE  
SOUTH DAKOTA  
AGRICULTURAL COLLEGE



AND THE  
DIRECTOR  
OF THE  
Agricultural Experiment Station  
FOR THE YEAR ENDING JUNE 30, 1900.

As Required by Act of Congress August 30, 1890,

# REPORT.

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*To the Honorable Secretary of the Interior and the Secretary of Agriculture:*

GENTLEMEN:

As required by Act of Congress of August 30th, 1890, I have the honor to submit you the annual report of the South Dakota Agricultural College for the year ended June 30th, 1900.

## *CONDITION AND PROGRESS OF THE INSTITUTION.*

There is steady improvement in the condition of the College. It is no longer obliged to solicit students but is perplexed to know how to provide for the constantly increasing numbers who come to it for instruction. Every department has been taxed to its utmost during the year. The instructional work is becoming more effective each year and modern methods are employed in all departments. The student body is made up of earnest young men and women, eager to improve themselves and anxious to see the college they attend prosper and grow in public favor.

There has been marked improvement in the condition of the buildings and grounds—several buildings were painted and some repaired extensively during the year.

Very important changes have been effected finally in the Courses of Study offered—these have been so radical as to justify quite explicit mention here.

Students have the largest possible freedom in choosing their studies consistent with sound training and effective scholarship.

DEGREES.—The college offers but two Baccalaureate degrees, Bachelor of Agriculture (B. Ag.) and Bachelor of Science (B. S.). For either degree the student must complete in a satisfactory manner the work of one of the schemes mentioned in following pages. These include not less than forty-three courses above the Sub-Freshman year. The degree of Master of Science may be conferred upon students who already hold the Baccalaureate degree, and who complete an additional amount of work equal to fourteen courses to be chosen from two departments, in each of which credit for six collegiate courses has already been obtained, the advanced work to be done as prescribed by the faculty. Eight of these courses, constituting the "major," must be chosen from one department, and six courses, called the "minor," from the other. At least one year of this work must be done while in residence.

SCHEMES OF STUDY.—The work leading to a Bachelor's degree may be done according to one of four general schemes, called groups A, B, C and D. Through these the work of the college is adapted not only to different classes of students, but to individual students themselves. The entrance requirements to each of these groups is the work of the Sub-Freshman year.

In each scheme, certain subjects, called required courses, must be taken by all students who follow that scheme; the remaining courses, called electives, can be selected by the students according to rules governing this choice.

Except in the case of group "D," which is designed for students of Pharmacy, nine elective courses are allowed, thus permitting the student to specialize during his last two years in college. In addition to these, the language work is largely elective, the student being allowed to choose between French, Latin or German, except in cases where his line of work makes one of them preferable to either of the others.

Before entering upon the duties of the Junior year, students should map out their work for the remaining two years, in a manner satisfactory to the professors under whom elective work is to be taken. Heads of the departments and members

of the classifying committee will give possible assistance towards helping the students in making a proper selection of subjects.

**ELECTIVES.**—The nine electives of Groups A, B and C must be chosen according to the following general rules:

No work ordinarily offered below the Sophomore year can be elected towards a degree. Where they deem it advisable, the faculty and heads of departments may impose special rules and restrictions governing the choice of electives. In no case shall the student be allowed to elect towards a degree more than three courses in industrial subjects such as cooking and shopwork, or exercise of a similar character, such as art and music; and these should be from the more advanced grades.

Five of the elective courses must be chosen along some one line of work, that in which the student wishes to specialize most, and shall constitute his "major." Three other courses must be chosen along some second line, and shall be called his "minor." One general elective is allowed, which is intended to permit the student to bring up his prerequisites, or in some other way to contribute to his general scholarship, and should be selected with reference to these ends.

Majors may be chosen in the following departments: Agriculture, Horticulture, Botany, Chemistry, Zoology, Veterinary Medicine, Pharmacy, English, History and Economics, Mathematics, Physics, Mechanical and Electrical Engineering, and Domestic Science.

Minors may be chosen in the same departments as majors, and also in Foreign Languages, Art and Music.

General electives may be chosen from those courses which are offered as major and minor subjects.

In group "C," since sewing and cooking are required, not more than one elective can be chosen from industrial work of the Domestic Science department.

**GROUP "A."**—The required courses of this group include those subjects which have a general application in the understanding of agricultural processes, thus affording the student the opportunity of laying the foundation for a broad scientific

education. Those satisfactorily completing the work outlined for this group will receive the degree of Bachelor of Science.

Students who wish to obtain a more extended training in Agriculture and Horticulture than this scheme permits, may elect Agricultural and Horticultural subjects in place of a foreign language. This work is intended to meet the wants of those who return to the farm and upon completing it in a satisfactory manner the student will receive the degree of Bachelor of Agriculture.

GROUP "B."—This group is intended for those students who wish to prepare themselves for pursuits which require only a general knowledge of mechanical and physical principles, as well as for those who wish to fit themselves for technical work in Mechanical and Electrical Engineering. It requires less literature, history and biology than group "A," and only one year of foreign language, French, is required. However, those who do not elect work in Mechanical or Electrical Engineering can continue study along these lines in the Junior and Senior years. Students electing majors and minors in Physics and Mechanics should pursue work according to this scheme. Those who wish to specialize in Mathematics can also follow to advantage the required work of this group. Those who take their elective work in mechanical or Electrical Engineering as outlined in the schedules of article 41 will receive the degree of Bachelor of Science in Engineering studies. Those who choose their main elective work in other departments than these two, will receive the degree of Bachelor of Science.

GROUP "C."—This group is group "A" modified to meet the wants of the young ladies, who are all required to take Sewing and Domestic Dairying instead of Surveying and General Agriculture, and Household Economy in place of the third term of Botany.

GROUP "D."—Students who satisfactorily complete the work of the first two years of this course will receive the degree of Pharmacy Graduate (Ph. G.). After the completion of the work of the next two years, the degree of Bachelor of

Science will be conferred. This work in Pharmacy is offered nowhere else in the state and has received the hearty commendation of the State Board of Pharmacy. The subjects of this group offer excellent preparation for all the medical professions as well as for the teaching of science in high schools and colleges. Three elective courses are allowed and must be chosen from those subjects which are offered as major electives.

**SCHEDULES OF THE GROUPS.**—On the next few pages the schedules of the work of the different groups are given. The subjects printed in ordinary type are the required courses while the electives are in *italics*. The notation immediately after the name of a subject indicates its nature and the number of times it occurs a week, "a" referring to the class work, and "b" to laboratory exercises. Whenever a choice is allowed between two subjects, as between Horticulture and English, the student must take that which bears more directly on his elective work. The student must understand that these schemes are models only, in which the elective work is taken from the most important departments. Students wishing to elect other subjects than those indicated in the schemes must choose them according to the rules governing the choice of electives. The work is arranged so that one elective course is offered during each term of the Junior year and two each term of the Senior year. While this is suggested as being the model arrangement, students will be allowed to follow schemes of their own, providing all requirements are satisfied.

**SCIENTIFIC AGRICULTURE. GROUP A.**

	FALL.	WINTER.	SPRING.
FRESHMAN.	8:30 Geometry .....a 5	Inorg. Chemistry.....a 3	Sys. Botany.....a 3, b 2
	9:30 Inorg. Chemistry.....a 3	Eng. Literature.....a 5	Trigonometry.....a 3
	10:30 Am. Literature.....a 5	Geometry.....a 5	Org. Chemistry.....a 4, b 1
	11:30 Military.....3	Military.....a 2	Military.....3
	2:00 Chem. Laboratory.....b 2	El. Botany.....a 1, b 1	Gen. Agriculture.....a 3
	3:00 El. Botany.....a 1, b 2	Chem. Laboratory... b 2	Surveying.....b 2
SOPH.	8:30 French.....a 5	Gen. History.....a 5	Adv. Physiology.....a 5
	9:30 El. Geology.....a 5	French.....a 5	French.....a 5
	10:30 Gen. Physics.....a 3, b 1	Soil Physics.....a 3, b 2	Gen. History.....a 5
		or Gen. Physics.....a 3, b 1	
	2:00 Physiolog. Bot.....a 2, b 3	Theory of Hort.....a 3	Forestry.....a 3
	3:00 German or Latin....a 5	or Eng. Classics.....a 3	or Eng. Classics.....a 3
		German or Latin.....a 5	German or Latin.....a 5

JUNIOR.	8:30	{ Breeds L. Stock...a 4, b 1 or Eng. History.....a 5			
	9:30	{ German or Latin.....a 5	Adv. Geology.....a 5	Am. Institutions.....a 5	
	10:30		German or Latin.....a 5	German or Latin.....a 5	
	11:30	Oratory.....a 3	Oratory.....a 1	Oratory.....a 1	
	2:00	French.....a 5	Adv. Zoology.....a 3	Psychology.....a 3	
SENIOR.	3:00	Q. Chemistry.....a 1, b 4	French.....a 5	French.....a 5	
	8:30		Chem. Foods.....a 3, b 2	Ag. Chemistry.....a 3, b 2	
	9:30	Astronomy.....a 5	Stock Breeding.....a 5	Landscape Gardening.....a 2	
	10:30	{ Ev. Cult. Plants.....a 3 Soil Fertility.....a 3	Economics.....a 5	Bacteriology.....a 2, b 3	
	11:30	Sociology.....a 3		Ethics & Pedagogy.....a 5	
	3:00	Vet. Med.....a 5	Ag. Experimentation, b 5	Entomology.....a 2, b 3	

## SCIENTIFIC HORTICULTURE. GROUP A.

		FALL.	WINTER.	SPRING.
FRESHMAN.	8:30	Geometry.....a 5	Inorg. Chemistry.....a 3	Sys. Botany.....a 3, b 2
	9:30	Inorg. Chemistry.....a 3	Eng. Literature.....a 5	Trigonometry.....a 3
	10:30	Am. Literature.....a 5	Geometry.....a 5	Org. Chemistry.....a 4, b 1
	11:30	Military.....3	Military.....a 2	Military.....3
	2:00	{ Chem. Laboratory.....b 2 El. Botany.....a 1, b 2	{ El. Botany.....a 1, b 1 Chem. Laboratory.....b 2	{ Gen. Agriculture.....a 3 Surveying.....b 2
SOPH.	8:30	French.....a 5	Gen. History.....a 5	Adv. Physiology.....a 5
	9:30	El. Geology.....a 5	French.....a 5	French.....a 5
	10:30	Gen. Physics.....a 3, b 1	Soil Physics.....a 3, b 1 or Gen. Physics.....a 3, b 1	Gen. History.....a 5
	2:00	Pysiol. Bot.....a 2, b 3	Theory of Hort.....a 3 or English Classics.....a 3	Forestry.....a 3 or English Classics.....a 3
	3:00	German or Latin.....a 5	German or Latin.....a 5	German or Latin.....a 5
JUNIOR.	8:30	{ Pomology.....a 5 or Eng. History.....a 5		
	9:30	{ German or Latin.....a 5	Adv. Geology.....a 5	Am. Institutions.....a 5
	10:30		German or Latin.....a 5	German or Latin.....a 5
	11:30	Oratory.....a 3	Oratory.....a 1	Oratory.....a 1
	2:00	French.....a 5	Adv. Zoology.....a 3	Psychology.....a 3
SENIOR.	3:00	Q. Chemistry.....a 1, b 4	French.....a 5	French.....a 5
	8:30		Mycology.....a 2, b 3	Ag. Chemistry.....a 3, b 2
	9:30	Astronomy.....a 5	Stock Breeding.....a 5	Landscape Gardening.....a 2
	10:30	{ Ev. Cult. Plants.....a 3 Soil Fertility.....a 3	Hort. Investigation.....b 5	Bacteriology.....a 2, b 3
	11:30	Sociology.....a 3	Economics.....a 5	Ethics & Pedagogy.....a 5
	3:00	Vet. Medicine.....a 5		Entomology.....a 2, b 3

## MECHANICAL ENGINEERING. GROUP B.

		FALL.	WINTER.	SPRING.
FRESHMAN.	8:30	Geometry.....a 5	Inorg. Chemistry.....a 3	Sys. Botany.....a 3, b 2
	9:30	Inorg. Chemistry.....a 3	Eng. Literature.....a 5	Trigonometry.....a 3
	10:30	Am. Literature.....a 5	Geometry.....a 5	Mech. Drawing.....b 2
	11:30	Military.....3	Military.....a 2	Military.....3
	2:00	Chem. Laboratory.....b 2	Mech. Drawing.....b 3	Mech. Drawing.....b 3
SOPH.	3:00	El. Botany.....a 1, b 2	Chem. Laboratory.....b 2	Surveying.....b 3
	8:30	French.....a 5	An. Geometry.....a 5	Calculus.....a 3
	9:30	El. Geology.....a 5	French.....a 5	French.....a 5
	10:30	Phys., a 3, b 1, Alg.....a 2	Gen. Physics.....a 3, b 1	El. Mechanics.....a 5
	2:00	Shopwork.....b 3	Shopwork.....b 5	Shopwork.....b 3
JUNIOR.	8:30	Adv. Physics.....a 3, b 2	Gen. History.....a 5	Steam Engine.....a 5
	9:30	Els. of Mechanism.....a 5	Adv. Physics.....a 3, b 2	Adv. Physics.....a 3, b 2
	10:30	Calculus.....a 3		Gen. History.....a 5
	11:30	Oratory.....a 3	Oratory, a 1, Adv. Zo. a 3	Oratory, a 1, Psych.....a 3
	2:00	Shopwork.....b 3		
SENIOR.	3:00		An. Mechanics.....a 5	
	8:30	Steam Boilers.....a 5	Str. in Frame Struct. a 6	
	9:30	Astronomy.....a 5	Dynamo El. Mach. a 3 b 2	Dyn. El. Mach.....a 3, b 2
	10:30		Economics.....a 3	Ethics & Pedagogy.....a 5
	11:30	Sociology.....a 3		
	2:00	Kinematics.....b 3	Eng. Design.....b 5	Eng. Design.....b 5
	3:00			

ELECTRICAL ENGINEERING. GROUP B.

	FALL.	WINTER.	SPRING.
FRESHMAN.	8:30 Geometry.....a 5	Inorg. Chemistry.....a 3	Sys. Botany.....a 3, b 2
	9:30 Inorg. Chemistry.....a 3	Eng. Literature.....a 5	Trigonometry.....a 3
	10:30 Am. Literature.....a 5	Geometry.....a 5	Mech. Drawing.....b 3
	11:30 Military.....3	Military.....a 2	Military.....3
	2:00 Chem. Laboratory.....b 2	Mech. Drawing.....b 3	Mech. Drawing.....b 3
	3:00 El. Botany.....a 1, b 2	Chem. Laboratory.....b 2	Surveying.....b 2
SOPH.	8:30 French.....a 5	An. Geometry.....a 5	Calculus.....a 5
	9:30 El. Geology.....a 5	French.....a 5	French.....a 5
	10:30 Phys., a 3, b 1, Alg.....a 2	Gen. Physics.....a 3, b 1	El. Mechanics.....a 5
	2:00 Shopwork.....b 3	Shopwork.....b 5	Shopwork.....b 3
	3:00		
JUNIOR.	8:30 Adv. Physics.....a 3, b 2	Gen. History.....a 5	Steam Engine.....a 5
	9:30 Els. of Mechanism.....a 5	Dynamo El. Mach., a 3 b 2	Dynamo El. Mach. a 3, b 2
	10:30		Gen. History.....a 5
	11:30 Oratory.....a 3	Oratory, a 1, Adv. Zo. a 3	Psych., a 3, Oratory.....a 1
	2:00 Elec. and Mag., a 3, b 2	Shopwork or Drawing, b 5	
	3:00		
SENIOR.	8:30 Steam Boilers.....a 5	Electric Light and Pow- er Distribution, a 3, b 2	Des. Power Sta....a 3, b 2
	9:30 Astronomy.....a 5	Economics.....a 3	Ethics & Pedagogy.....a 5
	10:30 Alt. Currents.....a 3, b 2	Shopwork or Draw'g, b 2	
	11:30 Sociology.....a 3	An. Mechanics.....a 5	{ Shopwork or Drawing.....b 3
	2:00 Shopwork or Draw'g, b 2		
	3:00		

DOMESTIC SCIENCE. GROUP C.

	FALL.	WINTER.	SPRING.
FRESHMAN.	8:30 Geometry.....a 5	Inorg. Chemistry.....a 3	Sys. Botany.....a 3, b 2
	9:30 Inorg. Chemistry.....a 3	Eng. Literature.....a 5	Trigonometry.....a 3
	10:30 Am. Literature.....a 5	Geometry.....a 5	Org. Chemistry.....a 4 b 1
	11:30 Physical Culture.....3	Physical Culture.....3	Physical Culture.....3
	2:00 Chem. Laboratory.....b 2	El. Botany.....a 1, b 1	Sewing.....b 3
	3:00 El. Botany.....a 1, b 2	Chem. Laboratory.....b 2	Dom. Dairying.....b 2
SOPH.	8:30 French.....a 5	Gen. History.....a 5	Adv. Physiology.....a 5
	9:30 El. Geology.....a 5	French.....a 5	French.....a 5
	10:30 Gen. Physics.....a 3, b 1	Gen. Physics.....a 3, b 1	Gen. History.....a 5
	11:30 Physical Culture.....3	Physical Culture.....3	Physical Culture.....3
	2:00 Household Economy, a 5	Eng. Classics.....a 3	Eng. Classics.....a 3
	3:00 German or Latin.....a 5	German or Latin.....a 5	German or Latin.....a 5
JUNIOR.	8:30 Eng. History.....a 5	Adv. Geology.....a 5	Am. Institutions.....a 5
	9:30 German or Latin.....a 5	German or Latin.....a 5	German or Latin.....a 5
	10:30	Adv. Zo., a 3, Oratory, a 1	Psych., a 3, Oratory, a 1
	11:30 Oratory.....a 3	French.....a 5	French.....a 5
	2:00 French.....a 5	Chem. of Foods.....a 3, b 2	Entomology.....a 3, b 2
	3:00 Q. Chemistry.....a 1, b 4		
SENIOR.	8:30 Household Sanit'n.....a 5	Invalid Cookery.....b 5	Bacteriology.....a 2, b 3
	9:30 Astronomy.....a 5	Economics.....a 5	Ethics and Pedagogy, a 5
	10:30		
	11:30 Sociology.....a 3	Elective.....5	Elective.....5
	2:00 Elective.....5		

PHARMACY. GROUP D.

	FALL.	WINTER.	SPRING.
FRESHMAN.	8:30 An. Methods.....a 3, b 2	Inorg. Chemistry.....a 3	Adv. Physiology.....a 5
	9:30 Inorg. Chemistry.....a 3	An. Methods.....a 3, b 2	Pharmacognosy, a 2, b 3
	10:30 Pharm. Latin.....a 5	Pharmacognosy.....a 3, b 2	Org. Chemistry.....a 4, b 1
	11:30 Military.....3	Military.....a 2	Military.....3
	2:00 Chem. Laboratory.....b 2	El. Botany.....a 1, b 1	Pharmacog. Lab.....b 3
	3:00 El. Botany.....a 1, b 2	Chem. Laboratory.....b 2	
SOPH.	8:30 Pharmacy.....a 5	Pharmacy.....a 5	Mat. Medica.....a 5
	9:30 Mat. Medica.....a 5	Mat. Medica.....a 5	Pharmacy.....a 5
	10:30 Am. Literature.....a 5		Pharmacy.....b 5
	11:30	Pharmacy.....b 5	Drug Assaying.....b 5
	2:00		
	3:00 Q. Chemistry.....a 1, b 4		

JUNIOR.	8:30	Geometry .....	a 5	Gen. History.....	a 5	Elective.....	a 5
	9:30	El. Geology.....	a 5	Eng. Literature ....	a 5	Trigonometry .....	a 3
	10:30	Gen. Physics.....	a 3, b 1	Geometry.....	a 5	Gen. History.....	a 5
	11:30	Oratory .....	a 3	Oratory .....	a 1	Psychology .....	a 3
SENIOR.	2:00					Oratory .....	a 1
						Surveying .....	b 2
	8:30	Elective .....	a 5	Elective.....	a 5		
	9:30	Astronomy.....	a 5	Adv. Geology.....	a 5	Am. Institutions.....	a 5
	10:30			Economics .....	a 5	Ethics & Pedagogy...	a 5
	11:30	Sociology .....	a 3				
	2:00						
	3:00	German or Latin.....	a 5	German or Latin.....	a 5	German or Latin.....	a 5

### PRACTICAL AGRICULTURE.

		FALL.	WINTER.	SPRING.
FRESHMAN.	8:30	Geometry, . . . . . a 5	Inorg. Chemistry, . . . . . a 3	Sys. Botany, . . . . . a 3, b 2
	9:30	Inorg. Chemistry, . . . . . a 3	Eng. Literature, . . . . . a 5	Trigonometry, . . . . . a 3
	10:30	Am. Literature, . . . . . a 5	Geometry, . . . . . a 5	Org. Chemistry, . . . . . a 4, b 1
	11:30	Military, . . . . . 3	Military, . . . . . a 2	Military, . . . . . 3
	2:00	Chem. Laboratory, . . . . . b 2	El. Botany, . . . . . a 1, b 1	Gen. Agriculture, . . . . . a 3
3:00	El. Botany, . . . . . a 1, b 2	Chem. Laboratory, . . . . . b 2	Surveying, . . . . . b 2	
SOPH.	8:30	Breeds L. Stock, . . . . . a 4, b 1	Gen. History, . . . . . a 5	Adv. Physiology, . . . . . a 5
	9:30	El. Geology, . . . . . a 5		
	10:30	Gen. Physics, . . . . . a 3, b 1	Soil Physics, . . . . . a 3, b 2	Gen. History, . . . . . a 2
	2:00		Theory of Hort., . . . . . a 3	Forestry, . . . . . a 3
	3:00	Physiolog. Bot., . . . . . a 2, b 3	Mycology, . . . . . a 3, b 2	Stock Feeding, . . . . . a 5
JUNIOR.	8:30	Pomology, . . . . . a 5	Stock Breeding, . . . . . a 5	Equip. Stock Farms, . . . . . a 5
	9:30	Dom. Dairying, . . . . . b 5	Adv. Geology, . . . . . a 5	Am. Institutions, . . . . . a 5
	10:30			
	11:30	Oratory, . . . . . a 3	{ Adv. Zoology, . . . . . a 3	{ Psychology, . . . . . a 3
	2:00		{ Oratory, . . . . . a 1	{ Oratory, . . . . . a 1
3:00	Q. Chemistry, . . . . . a 1, b 4	Chem. of Foods, . . . . . a 3, b 2	Ag. Chemistry, . . . . . a 3, b 2	
SENIOR.	8:30		Vet. Medicine, or, . . . . . a 5	Landscape Gard., . . . . . a 2
	9:30	Astronomy, . . . . . a 5	Hort. Investigation, . . . . . b 5	Bacteriology, . . . . . a 2, b 3
	10:30	{ Ev. Cult. Plants, . . . . . a 2	Economics, . . . . . a 5	Ethics & Pedagogy, . . . . . a 5
		{ Soil Fertility, . . . . . a 3		
	11:30	Sociology, . . . . . a 3		
	2:00		{ Ag. Experimentation . . . . . b 5	
3:00	Vet. Medicine, . . . . . a 5		Entomology, . . . . . a 2, b 3	

The college also offers several Short Courses of Instruction termed "Special" in a few important lines of work.

Those now offered are the following:—

1. A two years' course in Pharmacy, upon the completion of which the degree of Pharmacy Graduate is conferred. (See group "D.")
2. A one year's course in Business branches.
3. A one year's course in Amanuensis work.
4. A one year's course in Steam Engineering.
5. A one term's course in Agriculture.
6. A one term's course in Horticulture.
7. A one term's course in Dairy Science.
8. A special course in Music.
9. Special work in Art.
10. One term's course in Domestic Science.

*HOME INSTRUCTION.*

This effort to educate falls into two classes, Farmers' Institutes and Home Reading courses.

Twenty-four very successful institutes were held during the year.

The average attendance at these meetings was above one hundred people.

The last Legislature appropriated two thousand dollars a year for institute work.

The work of Home Reading comes in naturally as supplementing institute instruction and is fast becoming an important feature of education.

The following Home Reading Courses are now offered by the college.

*HOME READING COURSES OF THE SOUTH DAKOTA AGRICULTURAL COLLEGE.*

The object of these courses is to promote the interest and advance the knowledge of its readers in agricultural and household science. The courses of reading as prepared are especially adapted to farmers, fruit growers and stock breeders. Its domestic Science Course is valuable to any person interested in home making.

*EXPENSE.*

There is no expense connected with these courses except the purchase of books.

*MEMBERSHIP.*

Every person interested in farming, gardening, stock raising or home-making is earnestly invited to join our Home Reading club and take up a systematic course of reading along some of the lines offered. To secure a membership write the Superintendent of the South Dakota Agricultural College Home Reading club, asking to be enrolled as a member, or send for application blank which accompanies this circular. Upon the receipt of your application a certificate of membership will be

issued to you. This certificate of membership must accompany the first order for books in order to secure the reduced prices indicated in this circular.

#### YOU CAN READ ALONE.

One of the advantages of our Correspondence Course is, that while it is especially adapted to Farmers' clubs, indicating profitable subjects for discussion, it may be followed by any individual with the help of the instruction received from the college.

#### CHOICE OF COURSES.

Six courses are offered, any or all of which may be pursued. Each series or course contains five books on relative subjects which are usually so arranged as to develop the subject naturally, leading from simpler to more complex problems.

In special cases, options are offered in the supplementary list, thus varying the course to meet the special needs of the reader. The Superintendent will endeavor to arrange such courses to meet special needs.

#### HOW TO CARRY ON THE WORK

When beginning a book the student receives from the college a printed lesson of instruction covering certain portions of the work and making prominent the most salient points. Upon the completion of this section the reader fills out answers to questions asked and mails them to the Superintendent, who, upon examination, makes needful suggestions or corrects erroneous impressions where necessary. When the work of one section is satisfactorily completed the instructions for the next section are sent, until the book is completed.

#### DIPLOMAS.

Upon the satisfactory completion of a course of five books a certificate is issued to the reader showing that he has completed a course in the South Dakota Agricultural College Farm Home Reading Circle.

COURSES.

The following courses are offered:

Course 1—Crop Production.

Course 2—Live Stock Production.

Course 3—Horticulture and Floriculture.

Course 4—Dairying.

Course 5—Domestic Economy.

Course 6—Civics or Citizenship.

*BOOKS USED IN VARIOUS COURSES.*

COURSE 1—CROP PRODUCTION.

No. 1. Plant Life on the Farm—Masters; 130 pages, \$ .85.

Treats of plant nutrition, formation of plant structure, action of external influences, multiplication of plants, etc.

No. 2. The Fertility of the Land;—Roberts; 400 pages, \$ .94.

Discusses the Plant food in the soil and how to make it available; the manufacture and application of manures; the various phases of tillage, drainage, etc.

No. 3. The Soil.—King; 300 pages, \$ .70.

Gives a thorough discussion of the soil in its various relations to agriculture; treats of the production, texture and composition of the soils; soil temperature, drainage, tillage, etc.

No. 4. Manures and Manuring —Aikman; 600 pages, \$2.35.

Treats of the fertility of the soil; functions of manures; commercial fertilizers; materials of which fertilizers are made, etc.

No. 5. Irrigation Farming.—Wilcox; \$1.50.

Treats of the different systems of irrigation; of the construction of dams, reservoirs, canals and ditches; construction of artesian wells, surface wells, wind mills and all of the appliances for getting water on the soil. It treats of the different kinds of soil and their treatment; in fact it is a complete and reliable guide to practical irrigation.

## COURSE II.—LIVE STOCK PRODUCTION.

No. 6. Stock Breeding.—Miles; 400 pages. Price \$2.30.

Discusses the principles of breeding; heredity of characters and disease; in and in-breeding; cross-breeding, grading, pedigrees, etc. This book is optional with No. 24 or No. 25 in the supplementary list.

No. 7. The Domestic Sheep.—Stewart; 370 pages. Price \$1.65.

Treats of history and characteristics of various breeds of sheep, breeding, feeding, and general management, etc.

No. 8. Feeds and Feeding.—Henry; 650 pages. Price \$1.65.

Treats of the various phases of animal nutrition; composition and waste of the animal body; compounding rations for farm animals; the results of various rations under test and the general management of farm animals.

No. 9. Swine Husbandry.—Coburn; 300 pages. Price \$1.32.

Treats of history, characteristics and adaptability of various breeds of swine; breeding, fattening, housing, marketing, etc. This book is optional with No. 26 in the supplementary list.

No. 10. Manual of Veterinary Hygiene.—Smith.

## COURS III.—HORTICULTURE AND FLORICULTURE.

No. 11. Principles of Plant Culture.—Goff.

Treats of the principles underlying gardening; reasons for various methods of plant culture, propagation and improvement.

No. 12. Amateur Fruit Growing—Green.

Treats of principles and methods of fruit culture under the conditions prevailing in the northwest. Also 43—Principles of Fruit Growing—Bailey.

No. 13. Vegetable Gardening—Green.

Treats of the principles and methods of growing vegetables for home and market.

No. 14. Vick's Home Floriculture—Rexford.

Treats of the cultivation of flowers in house or garden.

No. 5. Irrigation Farming—Wilcox; 300 pages. Price \$1.27.

This book is optional with No. 38 in supplementary course.

COURSE IV—DAIRYING.

No. 15. Milk and its Products—Wing; 280 pages. Price \$.85.

Treats of the secretion and composition of milk, methods of testing milk, ferments and their control, ripening cream, churning and marketing butter; manufacture of cheese, and arrangement of factories.

No. 16. Chemistry of Dairying—Snyder. \$1.50.

Treats of composition of milk, testing milk, detecting adulterations, chemistry of butter-making and cheese making, dairy sanitation, etc. This book optional with No. 27 or 47, supplementary course for creamery operators.

No. 8. Feeds and Feeding—Henry; 650 pages. \$1.65.

See course 1.

No. 17. Cattle Breeding—Warfield; Price \$1.65.

Treats of methods of breeding to secure prepotency and individual excellence, and of the care and management of cattle.

No. 18. Silos, Ensilage and Silage—Miles; Price \$.44.

Treats of the principles of growth and storing up of nourishment in plants; changes of food value in the silo; construction, costs and capacity of silos, etc. Optional with No. 10 or No. 48, supplementary list.

COURSE V—DOMESTIC ECONOMY.

No. 19. The House Comfortable—Ormsbee; 230 pages. Price \$.85.

Treats of the ordinary comforts of the house as well as the finer and more costly luxuries. The management of various parts of the house, and furnishing and decoration are fully discussed.

No. 20. House Sanitation—Richards & Talbot; 80 pages.

A manual for housekeepers, treating in a practical manner of the care of the house, heating, lighting, ventilation, plumbing and general sanitary conditions.

No. 21. Chemistry of Cookery of Cleaning—Richards; 160 pages.

Treats of chemical composition of articles of daily use in a

manner easily understood by one who has no previous knowledge of chemistry.

No. 22. Boston Cooking School Cook Book—Miss Farmer; 567 pages. \$1.65.

Treats of foods, their composition and dietetic value and gives a compilation of tried and tested recipes.

No. 23. Food Products of the World—Green; 250 pages.

Treats of foods, their properties and dietetic value and composition; gives history of articles used as foods. This book optional with Numbers 13 or 14, Course III.

### *SUPPLEMENTARY LIST OF BOOKS.*

No. 24.	Cattle Breeding; Warfield.....	\$1 65
" 25.	Horse Breeding; Sanders.....	1 25
" 26.	American Dairying; Gurler.....	85
" 27.	Cheddar Cheese Making; Decker.....	90
" 28.	Handbook for Farmers and Dairymen; Woll....	1 28
" 29.	Farmers' Veterinary Adviser; Law.....	2 35
" 30.	Poultry Culture; Felch.....	1 28
" 31.	American Standard of Perfection (Poultry)....	85
" 32.	How Crops Grow; Johnson.....	1 49
" 33.	How Crops Feed; Johnson.....	1 49
" 34.	Agriculture in Some of its Relations to Chemistry; III volumes, Stover.....	5 15
" 35.	The Chemistry of Common Life; Johnson.....	1 65
" 36.	The Great World's Farm; Sehna Gage.....	
" 37.	Living Plants and their Properties; Arthur & McDougal.....	
" 38.	Garden Making (Landscape Gardening) Bailey..	85
" 39.	Green House Construction; Taft.....	1 27
" 40.	Green House Management; Taft.....	1 27
" 41.	The Nursery Book; Bailey.....	85
" 42.	Lessons with Plants; Bailey.....	
" 43.	Principles of Fruit Growing; Bailey.....	
" 44.	Plant Breeding; Bailey.....	85
" 45.	Cottage House; Reed.....	1 04

" 46. Barn Plan and Out-Buildings.....	1 27
" 47. Testing Milk and its Product; Farrington and Wall.....	85
" 48. Manual of Veterinary Physiology; Smith.....	

### *COURSE SIX IN CIVICS.*

For two years the college has been offering five courses of reading embracing all the different branches which pertain to the farmer. These courses have been so well received that we have concluded to offer others. The farmer is not only a producer of crops and stock but is something more, he is an intelligent being and citizen. As an intelligent being he has a desire to broaden and develop mentally. There is no reason why the farmer should not possess as broad a culture as the professional man. As a citizen it is his duty to understand the history of his country and the laws which underlie social existence. His fellow citizens will be affected by the intelligence with which he performs his duties of citizenship. It is, therefore, his duty to study the principles which underlie the laws, natural and static, governing social life.

We offer two courses in civics. Course I. is intended for those who have not had the advantage of a high school education or its equivalent. Course II. is intended for those who have done elementary work along the lines of the humanities, and desire to continue this study. It will not be possible in this issue of the courses to publish the price of these books but we will try to make arrangements to secure them at reduced prices.

#### *COURSE I.*

1. McMaster's History of the United States.
2. Lancaster's History of England.
3. Meyer's General History.
4. Smith & Young's South Dakota, supplemented by McCleary' Civics.
5. Thurston's Economics.
6. Halleck's Psychology.

7. Anderson's Elementary Sociology, or Smith & Vincent's Sociology.

#### COURSE II.

1. Channing's American History.
2. Larned's History of England.
3. Freeman's General History, or Fisher's.
4. Hindsdale's Civil Government.
5. Ely's Outlines of Economics, or Bullock's Political Economy.
6. Dewey's Psychology.
7. Gidding's Elements of Sociology.

Books that have no price quoted, we have been unable to secure quotations on. If we can secure quotations, we will give our readers the benefit.

#### LESSONS.

Lessons will be prepared on books of the course as required by our readers. These lessons will cover sections of the book under consideration and will be forwarded to the reader as needed. Each synopsis of the work will be accompanied by a list of questions which the student is requested to answer before being advanced to the next lesson.

#### *NEW BUILDINGS COMPLETED AND OCCUPIED DURING THE YEAR.*

##### 1. THE GYMNASIUM AND DRILL HALL.

This is a brick structure 66x77 feet and two stories high. The ground floor is devoted to a girls' gymnasium, offices, bath rooms, etc.

The second floor is all in one room without posts, is used for drill hall and gymnasium for the cadets.

Cost of the building, \$12,500.

##### 2. THE DAIRY OR AGRICULTURAL BUILDING.

This is also two stories and of brick, 32x52 feet.

The ground floor is occupied by the dairy proper and has the usual machinery, such as separators, vats, churns, etc.

Off from the main room are the laboratory, cheese making room and storage room.

The second floor contains class rooms, offices and the agricultural dairy museum.

Cost, \$7,500.

Both buildings are well equipped for the service they are intended to render the college.

Attendance during the year ending June 30th, 1900:

Post-Graduates.....	9
Seniors .....	18
Juniors .....	25
Sophomores .....	19
Freshmen .....	27
Sub-Freshmen.. .....	70
Preparatory.....	101
Commercial .....	37
Amanuensis .....	18
Pharmacy .....	17
Steam Engineers.....	55
Specials (Not exclusive in above deps).....	39
Dairy Department.....	11
Total.....	446

Receipts during the year ended June 30th, 1900:

Balance on hand July 1st, 1899..... \$ 1,328 76

State Aid:

(a) Income from endowment granted by state	0,000 00
(b) Appropriation for current expenses.....	17,500 00
(c) Appropriations for building or for other special purposes.....	22,500 00

Federal Aid:

(a) Income from land grant, act of July 2, 1862.....	0,000 00
(b) Additional endowment act of August 30, 1890 .....	25,000 00
(c) For experimental stations, act of March 2, 1887 .....	15,000 00

Fees and all other sources .....	12,645 61
Total.....	\$ 93,974 37
Expenditures for year ending June 30th, 1900:	
Instructions in the subjects specified in Sec. 1, act of	
Aug. 30, 1890.....	\$ 22,552 47
Instruction in all other subjects, if any.....	2,830 69
Administrative expenses, (President's, secretary's, librarian's salary, clerical services, fuel, light)	28,640 96
Experiment station.....	15,000 00
Total.....	\$ 69,024 12
For new buildings, etc.....	22,500 00
Total expenditures.....	\$ 91,524 12
Respectfully submitted,	
J. W. HESTON,	
Date, Nov. 1, 1900.	President.

### *THE AGRICULTURAL EXPERIMENT STATION.*

This department of the college is well provided with land, laboratories, appliances and funds. About sixty acres of the college farm is set aside for special experiments in crops and soil moisture determinations. The horticultural experiments cover another sixty acres with trees, shrubs and other experiments. A three story brick building is devoted almost entirely to the laboratory work of the station. The station has a corps of trained and experienced scientists constantly at work to discover new scientific truth and find its application to the industrial processes.

The accompanying report from the director of the station and his staff gives an account of the work in this department during the year ended June 30, 1900.

### *REPORT OF DIRECTOR.*

To President John W. Heston, South Dakota Agricultural College,

SIR: I have the honor herewith to transmit the annual report for the Agricultural Experiment Station of South Dakota for the fiscal year ending June 30th, 1900;

Very respectfully,

JAS. H. SHEPARD,  
Director.

The work of this station is now well established along certain definite lines requiring sustained investigation. Consequently little new work was taken up during the year just closed.

The Department of Agriculture is continuing soil moisture investigations and the mechanical analysis of soils. Crop rotation, the application of barn yard manure, variety tests of cereals, forage plants, root crops and other farm products is continued. Meteorological records are also kept.

Much work has been done with the new grains and forage crops recently imported from foreign countries by the U. S. Department of Agriculture.

This department is preparing a bulletin reciting the results obtained at Mellette in the James river valley during the past season. This will make the fourth bulletin for the present year. The work at Mellette has been discontinued.

During the year Animal Husbandry has been added to this department. Experiments in feeding, etc., will be carried on together with other work as more fully explained in the report of the agriculturist herewith appended.

The Department of Horticulture is working with fruits, trees and vegetables suited to the conditions existing in this state. Many promising varieties are under test. The origination of new varieties is an important feature.

Two bulletins have been issued by this department during the year. Bulletin No. 65 on the root killing of apple trees and Bulletin No. 67 on Melons. Further detail are found in the report of the horticulturist also appended.

The Department of Chemistry is continuing the chemical surveys of the soils of the state. The results are nearly ready for publication. The analysis of the sugar beets for farmers

living in localities where factories may soon be erected has been continued.

During the coming year the analysis of the new cereals and forage plants will be taken up. A more extended report is submitted in the report of the Chemist.

The Department of Botany and Entomology is still looking after injurious insects and plant diseases. It is also making interesting investigations in originating and improving new varieties of grains and grasses.

The work at Highmore with drouth resisting forage plants is under the immediate charge of this department. Bulletin No. 66 treating of that work has been issued. The report of the botanist gives further details.

The Department of Veterinary Science is giving much attention to contagious and virulent animal diseases. Tuberculosis and Anthrax cases have been investigated and personal visits made to most parts of the state east of the Missouri river. Further details are given in the report of this department which is submitted.

The correspondence of the station was particularly heavy during the year. The introduction and distribution of new farm crops has called out many letters inquiring how to handle these products. Moreover the farmers of the state are coming more and more to rely upon the station for advice and information. All inquiries have been promptly answered and it is but just to state that our work is better appreciated each year.

The demand for our bulletins is constantly increasing. This demand is by no means limited to our own state. It is evident that we shall soon be obliged to increase the number of copies issued, since when our regular mailing list is supplied only a few copies remain to send to applicants for back numbers.

I also note with satisfaction that our bulletins are largely quoted in the best agricultural papers of the United States.

Very respectfully.

JAS. H. SHEPARD,

Director.

*REPORT OF THE AGRICULTURIST.*

BROOKINGS, S. D., July 31, 1900.

JAS. H. SHEPARD, DIRECTOR:

DEAR SIR:—Complying with your request for a report of work of the Agricultural Department of the Experiment Station for the fiscal year ending June 30th, last, I respectfully submit the following:

The work has been a continuation of the general lines of work carried on during the last four years. The work in soil moisture which has been fully described in former reports and bulletins has been and still is being carried on under the same general plans adopted four years ago an immense amount of work has been done and a great mass of data has accumulated which will be worked out, summarized and published in a bulletin within the next year and it is hoped that the results will be of sufficient value to justify the large expenditure of labor, time and skill that they have cost. Some co-operation work with other of the western stations was begun during the year and is still being carried on.

Experiments with the electrical method of moisture determination were made during the year, but no very conclusive nor satisfactory results were obtained.

The mechanical analysis of the soils of the state which has been under way for several years, in co-operation with the Department of Chemistry has been finished as far as, the soils already collected will permit.

A bulletin containing these analyses will probably be published soon in co-operation with the Department of Chemistry.

The work in crop rotation has been carried on as planned four years ago and some valuable results are beginning to develop. A bulletin should be published on this subject soon.

The work of testing new varieties of seeds in co-operation with the division of seed introduction was given close attention, but the results obtained for 1899 were very unsatisfactory, owing to a severe storm that occurred on August 19, and

destroyed most of the crop before yields were obtained. The results for 1900 will not be much better, owing to the excessive dry weather during May and June.

The work at Mellette was brought to a close during the season of 1899, and a bulletin upon the general subject of Irrigation in South Dakota is under way, that should and would have been printed before this time had my other duties permitted.

The Animal Husbandry and Dairy work was not placed under the charge of the head of this department until about January 1st, 1900, and then only as a temporary arrangement. So it was impossible to undertake any systematic work. As it is now generally understood this work will remain permanently under the charge of the head of this department plans are being matured for some work in feeding and digestion.

My assistants, Mr. Holm in the soil physics laboratory and Mr. West the farm foreman and Mr. Thornber the herdsman, have all rendered faithful and valuable service. Mr. Lawrence who had charge of the work at Mellette, also proved a thoroughly trustworthy assistant.

All of which is respectfully submitted.

E. C. CHILCOTT,  
Agriculturalist.

#### *REPORT OF THE HORTICULTURAL DEPARTMENT.*

PROFESSOR JAMES H. SHEPARD,

Director Agricultural Experiment Station,  
Brookings, South Dakota.

MY DEAR SIR:—I have the honor to make the following report of work done in my department the past year and to outline the work for the ensuing year,

The experimental work during the fall months was carried on to the close of the season as outlined in my report for the last fiscal year. The work with vegetables and fruits consists not only in cultural and variety tests but in the originating of new varieties better adapted to prairie conditions.

Fully one thousand varieties of vegetables, of which about

four hundred were water melons and muskmelons, were on trial the past year. The season was favorable and good results were obtained. A display of vegetables and plums was made at the State Fair at Yaukton.

A Bulletin on "Root-killing of Apple Trees" was prepared and published as Bullitin No 65, dated July 1, 1899. This was a summary of the experiments in this department the past three years in testing the various stocks for the cultivated apple, together with a method of preventing winter killing of the tender roots upon which apple trees are grafted—the most serious obstacle to successful orcharding in the Northwest.

The results of experiments in 1898 and 1899 with about four hundred varieties of watermelons and muskmelons were published in Bullitin No. 67, dated April 1900. The results are briefly:—

1. The American muskmelons are much better adapted to this locality than any of the foreign varieties tested.

2. Among the Russian watermelons one was found superior in earliness to any of the American varieties tested.

3. From the earliest watermelon pure seed was grown. By continued selection we hope to increase the earliness of this variety, and in due season to distribute surplus seed for trial elsewhere.

Over fifty varieties of early tomatoes were tested. A beginning was made in the work of originating extra early varieties by crossing several of the earliest large varieties with those of the Red Cherry type. By crossing and selection it is hoped that a variety will be secured that will ripen in July instead of August and September. I am trying also to improve the native Nightshade by selection.

Part of the gardening was done from the home-gardening standpoint without the use of greenhouse or hot-bed, with the view of answering the questions often asked at Farmers' Institutes as to what can be done without either. Some interesting results were obtained and this line of work will be continued.

During the winter I have attended and delivered addresses at seventeen Farmers' Institutes and three Horticultural Society

meetings. This absence of ten weeks prevented the completion of bulletins covering the experiments completed the past year. But this will be done at the close of the present years' work with vegetables so that the results of both years' work may be published in one bulletin.

The experiments under way may be divided into two classes. First, variety and other tests with vegetables which can be completed in one year; second, those requiring a number of years to complete. To the latter class belong our extended work in plant-breeding. The climatic extremes of the Northwestern prairies make this work of breeding hardy fruits of the highest possible importance. This state must have hardy fruits, varieties hardy enough to flourish with ordinary care and without winter protection of any kind. The work consists in importing fruits from other countries with similar climates, and in improving our native fruits by cross-breeding and selection.

In 1898 we crossed the wild South Dakota raspberry with cultivated varieties and the resulting seedlings made a good growth the past year. The past winter wild strawberries from North Dakota, South Dakota and Manitoba, were grown in the greenhouse along with several of the choicest cultivated varieties, and the blossoms crossed. A large number of berries were obtained from the 785 flowers operated upon, the seeds sown, and now many thousand seedlings are coming on as the result of the work. This method of breeding strawberries is a new departure and from this work we hope to obtain good large strawberries that will need no winter protection.

Several thousand plants of the native currant and the gooseberry were grown last year from seeds of selected plants. The native sand cherry is receiving special attention. Fully five thousand plants have been fruited and the work of selection was completed the past season. Many thousand plants were grown the past year which will be fruited and the best varieties selected. Over two thousand of these were from plants to which numbers had been given because of large size and good quality. This species shows a remarkable tendency

to variation under cultivation, some of the plants bearing fruit of good size and quality. Similar work is under way with the grape, choke cherry, buffalo berry, plum and other native fruits, the American and Russian apples, and several Siberian fruits. We already have many thousand seedlings coming on of these fruits, especially of the native plum and grape, and the work is being carried on to the full limit of our working capacity.

For good results in this line of work good greenhouse facilities are absolutely necessary. I hope that the next Legislature will make an appropriation for a plant-breeding house which will make possible more extended work in this line. Prof. D. A. Saunders has work under way in the breeding of cereals and grasses; this new house would greatly aid in his work also.

This year vegetable experiments are chiefly with early tomatoes, egg plants, ground cherries and peppers. Sixty varieties of early tomatoes are on trial. This season we have been studying the first fruits of the crosses we made last year of the Cherry Tomato with pollen of the Early Ruby, Bond's Early Minnesota, and Ponderosa. The influence of both parents is apparent in both the plants and the fruit and there is a decided gain in earliness. This work in tomato-breeding will be made a special feature, with the hope of obtaining a very early variety.

The forestry plantations have made a good growth the past year. The Jack Pine from northwestern Minnesota has proven its remarkable hardiness in open exposure and is especially promising for wind breaks. Other evergreens of special promise are the Black Hills Spruce, the Native Red Cedar and the Colorado Blue Spruce.

In the spring of 1899 we distributed free over 50,000 Siberian Pea trees grown on the station grounds to applicants, chiefly in the northern part of the state. This is a hardy drough-resisting hedge plant. The seed was furnished by the U. S. Department of Agriculture and was obtained by the writer while in Russia. This year the work of distribution was completed,

a small charge being made to cover the cost of digging and handling. Further work of distributing new plants will be deferred until a special state appropriation is made for such purposes. The purpose of this work is not to compete with commercial nurserymen in any way, but to introduce new plants for trial from time to time.

A work which has been under way for the past eight years is now nearing completion. It consists of outline drawings and descriptions of the apples and crabs now in cultivation in the Northwest. The list now comprises several hundred varieties, and the work will be published when funds permit. The cost of publication in proper form will be considerable, but some such publication would be of service at the present stage of development of the pomology of the Northwest.

In order to find means of preventing root killing, of the apple and plum, now so common and disastrous, various methods of nursery propagation are being tested. This year several thousand seedlings of the true Siberian Crab (*Pyrus baccata*) are being grown from seed imported direct from Russia by the U. S. Department of Agriculture.

Mr. W. S. Thornber has assisted in the general scientific work of the department and has continued the work begun for his post-graduate thesis on the pollination of plum blossoms. The need of intermingling varieties of the native plum in orchards to insure proper fertilization is emphasized by these experiments.

Yours respectfully,

N. E. HANSEN,

Horticulturist.

DEPARTMENT OF CHEMISTRY.

Agricultural Experiment Station, Brookings, S. D.

June 31st, 1900.

This department is just closing a sustained investigation of the chemical characteristics of the soils of the state. In this work, during the past year, it has been much hampered by the lack of water and steam, but nevertheless 80 analyses

have been completed which taken together with those of the preceding year make 112 in all which are nearly ready for publication. In this investigation an accurate nitrogen determination will be an essential feature. These analyses are tedious requiring much time and care in their execution.

These soil samples are taken from uniformly distributed points over the eastern part of the state extending west to the Missouri River. The analyses are revealing important and useful facts in relation to the agricultural interests of the state.

Some experiments with sugar beets were carried on in a few localities where prospective sugar factories may be erected in the near future. While this Department had no control over these experiments, it became necessary for us to analyze such samples as the farmers growing the beets sent in. In all about 24 samples were analyzed.

Very few miscellaneous analyses were made during the year. Certain problems relating to pure foods are now creating considerable interest. While this Department could not take up these investigations officially, some relief was afforded by my assistant, Mr. Knox, who by working over hours answered some of the most pressing inquiries. This state needs an official Chemist and a well equipped laboratory for guarding the interests of the public health. Moreover more stringent pure food laws should be passed.

Upon completing the soil work, the analysis of the new forage plants and cereals recently introduced from Russia and elsewhere by the U. S. Department of Agriculture will be commenced. The object of these analyses will be to determine their feeding value. Some experiments, also, will be made in determining digestion coefficients co operating with the Department of Agriculture.

Very respectfully,

JAS. H. SHEPARD,

Chemist.

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*REPORT OF THE BOTANIST AND ENTOMOLOGIST.*

The work of the Botanist and Entomologist has been along the lines laid down in the last annual report.

Along entomological lines about hundred letters have been answered giving instructions as to remedies or means of combating destructive insects. The insects that have done the most damage in this state the past year are the grasshoppers, the wheat aphid and the blister beetle.

Nearly all of the counties bordering the Missouri river have reported some damage from grasshoppers, but it has been much greater in the southern part of the state. Several townships in Charles Mix County have been almost entirely destroyed and in others seriously damaged. The differential locust (*Melanopus differentialis*), the most destructive of all our native species of grasshoppers has been most abundant among the specimen submitted from that locality but few specimen also of the true migratory locust (*Melanopus spretus*) have been received.

The Wheat Aphid (*Siphonophora avenae*) has been received from a majority of the counties east of the Missouri river it is said to be very abundant in nearly all of the wheat fields. Several species also of the blister beetle have done great damage to garden crops all over the state.

But one new plant disease has appeared in the state—The Asparagus Rust. It was first noticed about the last of June. In a few days it had entirely covered all the plants, giving a reddish cast to the plant even at a distance.

A large number of noxious weeds have been sent to this department for identification. While no new ones have been received, a number of those already reported for the state have become more widely distributed.

A large number of very promising seeds of Russian grasses, cereals and forage plants have been received from the department of Agriculture. Most of these were obtained by Mr. M. A. Carleton, who spent a year in Russia, making a special study of the cereals of that country. Some of these plants have

already shown their adaptability to this region and that they are superior to the varieties now in use. It is hoped to issue a bulletin on these plants the coming year.

A new line of work has also been inaugurated—the breeding and selection of grains and grasses. By selecting the seed from the best individuals of the best varieties now known and giving these seed the optimum conditions of growth and selecting seed from the best individuals of this generation it is hoped to produce a larger or better yielding variety, better adapted to our conditions than the ones now obtainable. Also by cross-fertilization of these desirable varieties a number of variable individuals will be produced, some few of which may vary in the right direction. By selecting for one or more generations from such crosses new varieties more prolific than the old may be looked for.

A large number of crosses have already been made, the seed of which will be preserved for next year's planting. About 200 selections have also been made from the most promising varieties. At the Highmore station the work has been carried along the same lines the past year; another series of quarter acre plats have been broken up and a series of three year rotation started. Several scarifying experiments have been started, but it is too early yet to give results. The result of last year's work have been tabulated and published as Bulletin No. 66 of this station.

Respectfully submitted,

D. A. SAUNDERS.

#### *REPORT OF THE ZOOLOGIST AND VETERINARIAN.*

JAS. H. SHEPARD, Director,

SIR:—I have the honor to submit the following report from the department of Zoology and Veterinary Medicine.

During the past year the work of Eradicating Tuberculosis from the college herd was undertaken. According to instructions furnished by the Board of Regents all tuberculous animals were to be slaughtered. In order to make this radical method of treatment effective it was deemed advisable to

include in the slaughtered animals any in which the temperature reactions varied from what may be called the normal tuberculin reaction. Accordingly two animals were slaughtered which had given a slight rise of temperature and which were included under the head of doubtful. No tuberculous lesions were found at the autopsy of either of these animals, but tuberculous lesions of varying degrees of intensity were found in all the other cases, thus the remaining animals in the herd are as far as can be determined free from the disease. Later the upper portion of the cattle barn was sprayed with a Corrosive Sublimate water solution, fumigated with Sulphur, and then thoroughly sprayed with white wash, and consequently we believe well disinfected.

Investigation relative to the *Strongylees-contortus* (stomach worm) of sheep is at present in abeyance owing to lack of material. So far as treatment is concerned favorable results have been indicated from the employment of the copper sulphate treatment as well as from Santaum. Efforts were made last fall to try and keep the worms alive in the incubator, but the temperature proved so erratic that no results could be obtained. Since the new incubator has been procured no specimens of these worms have been found in our lambs.

The prevalence of Blackleg, the amount of vaccine distributed and the desirability of trying a serum therapy in this disease have all been dwelt upon in the last report from this department.

In addition to the contagious diseases noted as being prevalent, or to which our attention has been paid in our last report should be added influenza or pinkeye among horses. This has been very prevalent in the neighborhood of Brookings as well as in other localities. A visit has been paid to Toronto and some assistance rendered in treating the horses in that locality. In the majority of cases the attacks have been mild in character and have responded well to appropriate treatment.

At present material is being examined relative to a supposed outbreak of Anthrax in Brule County. A positive diagnosis has so far been withheld until fresher material is

obtained from the field of the outbreak in order that no mistake may arise owing to the resemblance in morphology between the Anthrax bacillus and certain putrefactive organisms.

Our correspondence during the past year has numbered about three hundred and fifty letters.

It will thus be apparent that during the past year the work of the Veterinary Department has consisted for the most part, first, in putting into practice the principle of sanitary veterinary medicine. The necessity for assuming to a certain extent the duties of a sanitary police official is apparent when one understands the peculiar condition of our state the office of State Veterinarian being practically done away with, although the official title still exists.

In the second place the Department has acted more largely as a centre from which knowledge already patent has been distributed among our stock owners.

Very respectfully,

E. L. MOORE.

# *FINANCIAL STATEMENT, JUNE 30, 1900.*

Outside of the United States appropriation this State has furnished the Station with heat, light and water to the value of about Four Hundred Dollars (400). From farm products from the Station plats \$464 01 have been realized, of which \$62.58 is now on hand.

The disbursements of the Hatch fund are shown in the following tabular statement:

## AGRICULTURAL EXPERIMENT STATION OF SOUTH DAKOTA.

	DR.	CR.
To Receipts from the Treasurer of the		
United States.....	\$15,000.00	
By Salaries,..... 1		\$10,432.94
“ Labor,..... 2		1,421.93
“ Publications,..... 3		1,170.25
“ Postage and stationery,..... 4		50.00

By Freight and express, .....	5	205 79
" Heat, light and water.....	6	717.04
" Chemical supplies,.....	7	151.59
" Seeds, plants and sundry supplies...	8	84.75
" Fertilizers.....	9	000.00
" Feeding stuffs,.....	10	000.00
" Library, .....	11	4.75
" Tools, implements, and machinery,..	12	195.00
" Furniture and fixtures,.....	13	000.00
" Scientific apparatus,.....	14	182 62
" Live stock,.....	15	120.00
" Traveling expenses, .....	16	103.25
" Contingent expenses,.....	17	36.76
" Building and repairs,.....	18	134.33
" Balance, .....		\$00,000.00
Total,		\$15,000.00 \$15,000.00