REPORT OF THE PRESIDENT
OF THE
SOUTH DAKOTA
AGRICULTURAL COLLEGE
AND THE
DIRECTOR
OF THE
AGRICULTURAL EXPERIMENT STATION
FOR THE YEAR ENDED JUNE 30, 1907
AS REQUIRED BY ACT OF CONGRESS, AUG. 30, 1890
REPORT

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

Gentlemen:—

In compliance with an act of Congress, passed August 30, 1890, I submit to you, herewith, the annual report of the South Dakota Agricultural College for the year ending June 30, 1907.

Change of Name of Institution.

One of the most important changes of the closing school year was the act of the Legislature, approved March 5, 1907, changing the name of the institution from South Dakota Agricultural College to South Dakota State College of Agriculture and Mechanic Arts. This bill went into effect July 1, 1907. By this departure there is no intention to minimize the agricultural features of the institution; but to have the name more nearly indicate the aim for which the institution was founded—instruction in agriculture and mechanic arts.

Establishment of School of Agriculture.

That there is no intention on the part of the authorities to slight the agricultural portion of the work, has been fully demonstrated by the establishment of a School of Agriculture as one of the departments of the college.

This school is designed to meet the needs of the young men and women who, having completed the eighth grade, are unable to enter any of the higher courses because obliged to work on the farm. The School of Agriculture will give courses of instruction extending only through the winters, the term begin-
ning in November and closing in April. A regular course will consist of three of these terms. The aim of these courses will be to prepare young people for life, both on the farm and in the farm home.

Such schools have been inaugurated in Minnesota and Nebraska and have been markedly successful. Their pronounced success warrants the hope of a broad field of usefulness in our own state.

The authorities have been fortunate in securing for principal of this school, Dr. Arthur A. Brigham, of Maryland, and as preceptress, Miss Jessie M. Hoover, of Kansas. Dr. Brigham is a graduate of the Massachusetts Agricultural College and received a doctorate degree from the University of Goettingen, Germany. He has held important positions as Professor of Agriculture in the Imperial Agricultural College of Japan, and also as Director of the Rhode Island Agricultural Experiment Station. Miss Hoover is a graduate of the Kansas State Normal School and of the Kansas State Agricultural College. She has had wide experience in Farmers' Institute work and in giving practical instruction in home economics.

As this school adds a new feature to our educational system, it has seemed wise to defer active operation until the attention of the farmers can be called to the plan of its operations. Therefore, the Principal and the Preceptress have been authorized to spend the winter of 1907-08 in institute work throughout the state, to call the attention of the farming population to this work and also to become familiar with agricultural conditions prevailing in South Dakota.

A tentative course of study was adopted before the appointment of the Principal and the Preceptress; but it seems well not to incorporate this course into a formal report, until after it has been studied and revised by those who will have the main responsibility.

Faculty Changes.

During the year changes have been made in the faculty as follows: Elmer K. Eyerly, who had been at the head of
the English department for eight years, resigned to engage in commercial work. For the same reason Austin B. Crane, of the department of civil engineering, and William A. Wheeler, of the department of botany, handed in their resignations. The vacancy in the department of civil engineering was filled by the election of Dr. Homer M. Derr, who holds the degree, A. B., Leland Stanford University, A. M., Columbia University, and Ph. D., University of Pennsylvania. Dr. Edgar W. Olive, a graduate of Wabash College, and a Doctor of Philosophy of Harvard University, has succeeded to the chair of botany. The vacancy in the department of English was not filled at the close of the fiscal year.

Another appointment that should be noticed is that of Mr. Robert Matheson as instructor in entomology and nature study. For a number of years the college and station had been without the services of a specially trained entomologist. Mr. Matheson is a graduate of Cornell University, having received special training under Prof. and Mrs. Comstock.

Farmers' Institutes.

The Farmers' Institutes of the year have been conducted under the leadership of Superintendent A. E. Chamberlain. Seventy-one meetings were held in forty counties. The large attendance and the interest taken by the farmers of the state indicate the wisdom of the appropriation for this work. As the Legislature of 1907 increased the annual appropriation for the next two years from $5000 to $7500, we are anticipating increased interest and greater efficiency. We feel assured that the institutes can only be regarded as a permanent feature of agricultural education in South Dakota.

Farmers' Excursions.

The large attendance on "Farmers' Excursion Day" of 1906 made it desirable to run special trains on different days from different sections of the state. Wednesday and Thursday, June 5 and 6, were the days selected for the 1907 excursions.
On Wednesday, trains were run from the northern part of the state and on Thursday from the southern: every part of the State reached by the Chicago & North-Western Road receiving the benefit of the reduced rates. The large crowds spent the day inspecting the various departments of the college and station. There is no doubt in the minds of the authorities that the excursions have a far-reaching benefit in giving the South Dakota farmers an opportunity to become personally acquainted with the work being carried on by the Experiment Station corps and also with the various departments of the State College.

Students During Year Ended June 30, 1907.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparatory classes</td>
<td>155</td>
<td>47</td>
</tr>
<tr>
<td>Collegiate classes</td>
<td>124</td>
<td>59</td>
</tr>
<tr>
<td>Post Graduate classes</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Short or Special courses</td>
<td>122</td>
<td>41</td>
</tr>
<tr>
<td>Number that pursued courses in Engineering</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Number that pursued courses in Agriculture</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>Household Economy</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Dairying</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Military Tactics</td>
<td></td>
<td>126</td>
</tr>
</tbody>
</table>

Degrees Conferred.

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master of Science</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td>17</td>
<td>7</td>
</tr>
<tr>
<td>Pharmacy Graduates</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Certificates Issued on Completion of Short Courses.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Amenuensis</td>
<td>4</td>
</tr>
<tr>
<td>Dairy</td>
<td>9</td>
</tr>
<tr>
<td>Music</td>
<td>4</td>
</tr>
<tr>
<td>Steam Engineering</td>
<td>26</td>
</tr>
</tbody>
</table>
STATE AGRICULTURAL COLLEGE.

Professors and Instructors During Year Ended June 30, 1907.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparatory classes</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Collegiate and Special classes</td>
<td>29</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>31</td>
<td>6</td>
</tr>
</tbody>
</table>

Number in Experiment Station staff, 6

As required by the rules of the Department of the Interior, I herewith submit the annual financial report of the Secretary of the College; also the report of work done in the Agricultural Experiment Station during the year ending June 30, 1907.

Respectfully submitted,

ROBERT L. SLAGLE.

President.
President Robert L. Slagle,
So. Dak. Agricultural College.

Sir:—

I have the honor to transmit herewith the financial report for the fiscal year ended June 30, 1907. This includes the report for the college proper, the experiment station and farm departments and the Highmore Sub-Station.

Respectfully submitted,

R. A. Larson,
Secretary.

Statement of receipts and disbursements for the South Dakota Agricultural College together with the Experiment Station and Farm Departments, and the Highmore Sub-Station for the fiscal year ended June 30, 1907.

College.

Receipts.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriation for salaries</td>
<td>$13000 00</td>
</tr>
<tr>
<td>Appropriation for maintenance</td>
<td>17700 00</td>
</tr>
<tr>
<td>General Government (Morrill Fund)</td>
<td>25000 00</td>
</tr>
<tr>
<td>Receipts from Endowment Lands</td>
<td>14772 85</td>
</tr>
<tr>
<td>Receipts from tuition, fees, etc.</td>
<td>7800 95</td>
</tr>
<tr>
<td>Balance on hand July 1, 1906</td>
<td>10566 02</td>
</tr>
</tbody>
</table>

Total, .................................................................$88839 82

Disbursements.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries</td>
<td>$46438 97</td>
</tr>
<tr>
<td>Fuel, light and water</td>
<td>9117 93</td>
</tr>
<tr>
<td>Repairs on buildings</td>
<td>2909 91</td>
</tr>
<tr>
<td>Labor</td>
<td>2527 23</td>
</tr>
<tr>
<td>Student details</td>
<td>2921 00</td>
</tr>
<tr>
<td>Grounds</td>
<td>1287 98</td>
</tr>
<tr>
<td>Postage, freight, express, telephone, etc.</td>
<td>1689 66</td>
</tr>
<tr>
<td>Stationery</td>
<td>508 97</td>
</tr>
<tr>
<td>Printing</td>
<td>1520 95</td>
</tr>
<tr>
<td>Machinery and apparatus</td>
<td>8285 08</td>
</tr>
</tbody>
</table>
STATE AGRICULTURAL COLLEGE.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory supplies</td>
<td>1485 44</td>
</tr>
<tr>
<td>Library</td>
<td>1061 83</td>
</tr>
<tr>
<td>Furniture and Fixtures</td>
<td>521 00</td>
</tr>
<tr>
<td>Traveling expenses, livery, etc.</td>
<td>701 05</td>
</tr>
<tr>
<td>Miscellaneous maintenance</td>
<td>2220 65</td>
</tr>
<tr>
<td>Balance on hand June 30, 1907</td>
<td>5642 17</td>
</tr>
</tbody>
</table>

Total: $88839 82

South Dakota Agricultural Experiment Station.

IN ACCOUNT WITH

The United States Appropriations, 1906-1907.

Dr. Hatch F'd. Adams F'd

To Receipts from the Treasurer of the United States as per appropriations for fiscal year ended June 30, 1907, under acts of Congress approved March 2, 1887 (Hatch Fund), and March 16, 1906, (Adams Fund) $15000 00 $7000 00

Cr.

By Salaries .................................. 7379 00  1986 00
  Labor ...................................... 2540 40  3153 50
  Publications ................................ 1587 55
  Postage and stationery .................... 227 93   34 69
  Freight and express ....................... 237 32   183 69
  Heat, light, water and power ............ 00 00   00 00
  Chemical supplies ......................... 432 64   355 38
  Seeds, plants and sundry supplies .......... 647 28   170 08
  Fertilizers ................................ 00 00   00 00
  Feeding stuffs ............................ 581 26   60 80
  Library .................................... 00 00   00 00
  Tools, implements and machinery .......... 114 90   101 75
  Furniture and fixtures .................... 45 00   00 00
REPORT OF THE PRESIDENT

Station Local Fund Account.

Receipts.

Balance on hand July 1, 1906 ......................... $ 495 41
Received from sales of produce, etc. .................. 2463 40

Total, ............................................. $2958 81

Expenditures.

Labor ............................................... 101 20
Publications ..................................... 84 75
Freight and express ................................ 23 15
Seeds, plants and sundry supplies .................. 570 34
Feeding stuffs .................................... 949 93
Library ............................................ 5 63
Tools, implements and machinery .................... 241 31
Scientific apparatus ................................ 18 85
Traveling expense ................................ 169 70
Buildings ......................................... 418 01
Balance on hand June 30, 1907 ......................... 375 94

Total, ............................................. $2958 81

Farm Expense Fund Account.

Receipts.

Appropriation ...................................... $3000 00
STATE AGRICULTURAL COLLEGE.

Expenditures.

Salaries and labor $2560.53
Feeding stuffs 296.97
Live stock 100.00
Other expenses 42.50

Total, $3000.00

Farm Local Fund Account.

Receipts.

Balance on hand July 1, 1906 $09
Received from sale of produce 5272.70

Total, $5272.79

Expenditures.

Salaries and labor $643.10
Feeding stuffs 2465.89
Live stock 400.00
Tools and machinery 326.51
Repairs on buildings, fences and other miscellaneous expense 1003.38
Balance on hand June 30, 1907 433.91

Total, $5272.79

Highmore Sub-Station Account.

Receipts.

Appropriation $1200.00
## REPORT OF THE PRESIDENT

### Expenditures.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>$590.13</td>
</tr>
<tr>
<td>Stationery, blanks, etc.</td>
<td>44.07</td>
</tr>
<tr>
<td>Freight and express</td>
<td>3.92</td>
</tr>
<tr>
<td>Heat, light and power</td>
<td>28.15</td>
</tr>
<tr>
<td>Feed</td>
<td>53.65</td>
</tr>
<tr>
<td>Tools, implements, etc.</td>
<td>107.86</td>
</tr>
<tr>
<td>Traveling expenses</td>
<td>338.46</td>
</tr>
<tr>
<td>Other sundry supplies and expenses</td>
<td>33.76</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1200.00</strong></td>
</tr>
</tbody>
</table>

### Highmore Sub-Station Local Fund Account.

#### Receipts.

- From sales of produce: $462.48

#### Expenditures.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>$179.13</td>
</tr>
<tr>
<td>Stationery</td>
<td>1.75</td>
</tr>
<tr>
<td>Freight and express</td>
<td>6.27</td>
</tr>
<tr>
<td>Seeds, plants, etc.</td>
<td>4.10</td>
</tr>
<tr>
<td>Feed</td>
<td>33.28</td>
</tr>
<tr>
<td>Tools, implements, etc.</td>
<td>6.30</td>
</tr>
<tr>
<td>Traveling expense</td>
<td>19.29</td>
</tr>
<tr>
<td>Repairs on buildings</td>
<td>7.23</td>
</tr>
<tr>
<td>Publishing notices for bids</td>
<td>23.93</td>
</tr>
<tr>
<td>Other miscellaneous expenses</td>
<td>25.27</td>
</tr>
<tr>
<td>Balance on hand June 30, 1907</td>
<td>155.93</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$462.48</strong></td>
</tr>
</tbody>
</table>

President Robert L. Slagle,  
South Dakota State College.

**Sir:**—  
I have the honor to submit the following report of the
The Staff.

With the exception of the resignation of Prof. W. A. Wheeler, Botanist and Entomologist, a few weeks before the close of the year to accept a more lucrative position, the personnel was the same as for last year. The salaries received by men doing College and Station work at this institution are not equal to the salaries received at similar institutions in the adjoining states and in some cases are less than assistant’s salaries in other states. This is a condition of affairs which should be remedied. The loss of a department chief means a setback in the investigations of that department and a loss to the station as a whole, as it requires time for the successor to familiarize himself with conditions. He also has new ideas which requires new equipment. I respectfully recommend that members of the station Council receive a salary which is at least an average of the compensation received by scientists in the same line of work at similar institutions in the adjoining states.

The Work.

The work of the Experiment Station, during the past year, covered a larger field of investigation than ever before. This increase was caused by the additional funds received from the federal government under the provision of Congress known as the Adams Act.

The Experiment Station includes six departments, viz.: Agronomy, Animal Husbandry, Botany and Entomology, Chemistry, Horticulture, and Veterinary. The sum of seven thousand dollars received under the provisions of the Adams Act was confined to research investigation in the department of Agronomy, Chemistry, Horticulture and Veterinary. This Station did not receive the initial appropriation of five thousand dollars carried by this Act on account of the lateness of the hour when notification was received of its availability and other cir-
cumstances which could not be prevented. With the addition of this new fund, and the strict regulations promulgated by the Department of Agriculture under which it can be expended, it will be necessary for the State, in the near future, to make an appropriation to properly carry on the work of the Experiment Station.

Professor N. E. Hansen, the Station horticulturist, was sent to foreign countries by the United States Department of Agriculture, as an agricultural explorer, to secure seeds of plants hardy in the Northwest. This trip covered a period of six months and many new things were secured, the bulk of which was sent to this Station for propagation. These new plants are doing well and it is hoped in time to make a detailed report of each of the over three hundred varieties obtained.

The raising of live stock is the most important industry in this state. Five per cent., the amount allowed by law, of the two federal funds, the Hatch and the Adams, was used to erect a Veterinary building for investigations in the diseases affecting live stock.

Co-Operative Work.

The Station has co-operated during the past year with the federal government in the following lines: 1, In dipping sheep affected with scabbies; 2, In growing sugar beets; 3, In growing grains and forage plants suitable to South Dakota conditions.

I—The experiment in dipping sheep was inaugurated late in the spring of 1906 and has been continued up to the present time. Before the end of the present fiscal year it will have been completed and the results published in bulletin form.

II—The object of the co-operative experiment in growing sugar beets is to determine which varieties are best suited to the soil and climatic conditions of South Dakota and also to increase the yield of sugar per acre by selection.

III—The object of co-operating in growing grains and forage plants are (1) to improve the wheat industry of the northern plains by discovering or producing varieties better than those
now grown, especially with regard to nitrogen content, yield, earliness, drought-resistance, etc.; (3) to determine the effect of changes of environment upon the growth of cereals, particularly the composition of the wheat kernel; (4) to produce by selection and hybridization improved varieties of forage and other crop plants, especially with a view to better adapting such plants to semi-arid regions, increasing their productiveness, drought-resistance, and other desirable qualities; (5) to determine the best method of soil preparation and crop rotation for conservation of moisture and the maintenance of humus in the soil of the Great Plains Area.

By co-operating these lines of investigation can be conducted on a larger scale and the results will be more valuable than if the men of the various departments were conducting the experiments themselves as the government furnishes part of the equipment, pays for part of the labor and consultation is very valuable in Experiment Station work.

Sub-Stations.

The South Dakota Legislature of 1906-07 provided for the establishment of three new sub-stations. Two of these stations are to be located west of the Missouri River and one in the northern section of the State. The income from twenty-five thousand acres of land was set apart for their support. With the already established and flourishing sub-station at Highmore, a better opportunity than ever before will be afforded the scientists at the home station to obtain results under a wide range of conditions. Many very interesting and valuable results are being secured at the Highmore Sub-Station. The report of W. A. Wheeler, printed in bulletin form before he resigned, shows that much work was undertaken in plant breeding and testing forage crops. In addition to this the government is co-operating in several experiments by furnishing grains, labor and partial supervision.
Department of Animal Husbandry.

This department issued one bulletin during the year on “The Feeding Value of Speltz in Beef and Pork Production.”

An experiment in feeding condimental stock foods to pigs was conducted during the fall of 1906, but before publishing the results it was deemed advisable to repeat the experiment the present year. The object of this experiment was to ascertain what value these five different brands of stock foods were for the growing pig as compared to no stock food at all. It was also desirable to learn which of the five different condimental foods were the best for producing a quick growth and a rapid gain. Results of this experiment will be published during the winter of 1907-08 with a chemical analysis of each food used.

The experiment in breeding and feeding sheep inaugurated a few years ago is not completed but a progress bulletin will be issued the present year giving results of the first two years’ work. By this one may get an idea of the relative value of the six pure bred breeds used for crossing on the common western bred ewe.

The results of the experiment in originating a new breed of swine, better suited to our conditions than any we now have, are very satisfactory.

Twelve thousand nine hundred doses of blackleg vaccine have been distributed upon request to stockmen in South Dakota and adjoining states.

Publications.

Five bulletins were issued during the year, numbering from 100 to 104 inclusive, on the following subjects: “The Feeding Value of Speltz in Beef and Pork Production,” “Forage Plants at the Highmore Station,” “Evergreens for South Dakota,” “Breeding Hardy Strawberries,” “Raspberries, Blackberries and Dewberries.”

A press bulletin of the Veterinary Department was also issued on the subject: “Tape Worms in Sheep.”

Bulletin No. 100 gives the results of feeding speltz to steers
and hogs as a single grain ration and when mixed half and half with corn.

Four lots of two-year old steers were used in this experiment and hogs were placed in the yards to follow the steers. Each lot received prairie hay and all the grain they could eat. The average daily grain fed per steer from the beginning to the end of the experiment, 170 days, was as follows: Shelled corn 20 pounds, whole speltz 18.9 pounds, corn and speltz mixed half and half by weight 18.48 pounds, and ground speltz 17.39 pounds.

These steers when fat, were shipped to the Chicago market and sold on their merits as follows: Corn, $6.10; Speltz, $5.85; Corn and Speltz, $5.75; and ground Speltz, $5.75 per hundred pounds. The $6.10 being the highest price paid for cattle that day.

After the cattle were sold, the lots of hogs were fed 44 days longer on the same grain rations the steers were getting to determine the number of pounds of grain required to produce a pound of grain. From this the number of pounds of gain made by the hogs while following the steers was determined as each lot of hogs was fed extra during the experiment.

A summary of experiments with speltz, to date, is also reported in this bulletin.

Bulletin No. 101 contains results of the work at the Forage Testing Station at Highmore. Alfalfa, millet, sorghum and corn are the principal crops under consideration at this station. The author makes report on varieties under trial from various sources.

Bulletin No. 102, "Evergreens in South Dakota" contains 64 pages illustrated with 26 half-tone engravings and is a summary of the experience in the planting and management of evergreens throughout the State.

Bulletin No. 103, "Breeding Hardy Strawberries" contains 48 pages, of which 20 are illustrated with half-tone engravings. It is a summary of the experiments to date at this Station in originating strawberries hardier than any now cultivated. Out of over 8000 seedlings produced by crossing the wild strawberries of the prairie Northwest with standard cultivated varieties, a number have been secured combining the hardiness of plant
of the wild with the large fruit of the tame. No variety is saved for propagation that does not endure the severest winters without mulching.

Bulletin No. 104, "Raspberries, Blackberries and Dewberries," contains 32 pages, of which 17 are illustrated with halftone engravings. A summary of the experience with these fruits in various parts of the State is given. Also of the extensive experiments at this Station in breeding raspberries that will endure the winter without protection; over 7000 seedlings have been fruited at this Station in the effort to solve this problem and some choice varieties obtained by crossing the wild raspberries of the prairie Northwest with cultivated varieties.

The press bulletin of the Veterinary Department calls attention to the symptoms noticeable when lambs are affected with Tape Worms, the treatment they should receive and the precautions the farmer should take to prevent the trouble.

Eighteen thousand copies of each bulletin were printed and between fourteen and fifteen thousand were distributed, being an increase of about four thousand during the past year.

The bulletins are sent in exchange for the following weekly and monthly publications:

**Foreign.**

- Agricultural Gazette, W. A. Gullick, South Wales.
- Agricultural Journal of India, Thacker & Spink, Calcutta.
- Agricultural Chemistry, Bangalore.
- Abteiling fur Samenkontrolle, Hamburg.
- Bureau of Science, Manilla.
- Boletein da Agricultra, Sao Paulo, Brazil.
- Bulletin of the Department of Agriculture, Kingston, Jamaica.
- Division of Biology and Horticulture, Wellington.
- Dep't. of Agr. Victoria, Allen Morrison, Melbourne.
- Die landwirtschaftlichen Versuchs Stationen, Berlin.
- Estacion experimental para cana. de agucai, Lima, Peru
- El Cultivo Del Trigo, Buenos Aires.
Hokaido Agricultural Ex. Stat., Sapporo, Japan.
Jahresbericht.
Les Orges Cullinees, Milan.
Les Ravines Et Les Sables, Toulouse.
New Zealand Dairyman, Wellington, N. Z.
O Criador Pau lista, Sao Paulo, Brazil.

AMERICAN LIST.
American Sugar Industry, Chicago, Ill.
American Fertilizer, Philadelphia, Penn.
American Farm World, Chicago, Ill.
American Swineherd, Chicago, Ill.
Agricultural Epitomist, Spencer, Ind.
American Miller, Chicago, Ill.
Better Fruits, Hood River, Oregon.
Country Calendar, Harrisburg, Pa.
Cotton Seed, Atlanta, Georgia.
Colman's Rural World, St. Louis, Mo.
Chicago Markets, Chicago, Ill.
Dakota Farmer, Aberdeen, S. D.
Dairy Record, St. Paul, Minn.
Elgin Dairy Report, Elgin, Ill.
Flour and Feed, Milwaukee, Wis.
Fruit Grower, St. Joseph, Mo.
Field and Farm, Denver, Col.
Farmers and Drovers' Journal, Union Stock Yards, Chicago.
Farm Folks, Kansas City, Mo.
Farmer's Advocate, Winnipeg, Man.
Farm, Field and Fireside, Chicago, Ill.
Farm Life, Chicago, Ill.
Forestry and Irrigation, Washington, D. C.
Farmer, The, St. Paul, Minn.
Farmer and Breeder, Sioux City, Iowa.
Farm, Stock and Home, Minneapolis, Minn.
Farmer's Tribune, Sioux City, Iowa.
Farm and Real Estate Journal, Traer, Iowa.
Furrow, The, Iowa State College.
Farm Star, Indianapolis, Ind.
Farm and Stock, St. Joseph, Mo.
Gospodarz, Omaha, Neb.
Homestead, Des Moines, Iowa.
Holstein-Friesian World, Ithica, N. Y.
Hospodar, Omaha, Neb.
Hospodar, Listy, Chicago, Ill.
Hoard's Dairymen, Fort Atkinson, Wis.
Industrious Hen, Knoxville, Tenn.
Indian School Journal, Chilviers, Okl.
Jersey Bulletin, Indianapolis.
Kimball's Dairy Farmer, Waterloo, Iowa.
Kansas Farmer, Topeka, Kan.
Lebanon Independent, Lebanon, S. D.
Live Stock and Dairy Journal, San Francisco, Cal.
Mo. Agr. College Farmer, Columbia, Mo.
Modern Farmer, St. Joseph, Mo.
Metropolitan and Rural Home, New York City.
National Stockman and Farmer, Chicago, Ill.
Nebraska Farmer, Lincoln, Neb.
Northwestern Agriculturist, Minneapolis, Minn.
Orange Judd Farmer, Chicago, Ill.
Pacific Dairy Review, San Francisco, Cal.
Progressive Poultry Journal, Mitchell, S. D.
Planter's Journal, The, Memphis, Tenn.
Poultry Husbandry, Waterville, N. Y.
Reliable Poultry Journal, Quincy, Ill.
Rural New Yorker, New York City.
Southern Farm Magazine, Baltimore, Md.
St Paul Daily Reporter, St. Paul, Minn.
South Dakota Farmer, Sioux Falls, S. D.
Successful Poultry Journal, 355 Dearborn St., Chicago.
Successful Farming, Des Moines, Iowa.
Valve World, Chicago, Ill.
Weekly Live Stock Report, Chicago, Ill.
Wallace's Farmer, Des Moines, Iowa.

Financial Statements.

The following statements show how the $15000.00 and the $7000.00 received under the provisions of the Hatch and Adams funds were apportioned for the year.

**The Hatch Fund**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries</td>
<td>$8285 00</td>
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<tr>
<td>Printing</td>
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<tr>
<td>Agronomy</td>
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<tr>
<td>Animal Husbandry</td>
<td>770 00</td>
</tr>
<tr>
<td>Botany and Entomology</td>
<td>1300 00</td>
</tr>
<tr>
<td>Chemistry</td>
<td>300 00</td>
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<tr>
<td>Horticulture</td>
<td>545 00</td>
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<tr>
<td>Executive</td>
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<tr>
<td>Veterinary</td>
<td>950 00</td>
</tr>
<tr>
<td><strong>Total,</strong></td>
<td><strong>$15000 00</strong></td>
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**The Adams Fund**

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<td>Agronomy</td>
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<tr>
<td>Chemistry</td>
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<tr>
<td><strong>Total,</strong></td>
<td><strong>$7000 00</strong></td>
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</tbody>
</table>
In addition to this the following was received for experimental work:

State appropriation for Forage Testing Station at Highmore .......................... $1200 00

Co-operative, United States Department of Agriculture, Cereal Investigation at Highmore and home Station........... $1500 00

For a more detailed account of the work in each department of the Experiment Station, I refer you to reports hereto attached.

Yours truly,

James W. Wilson.
Dear Sir:—

I have the honor to submit the following report of the Horticultural Department for the fiscal year ending June 30, 1907.

From June 28th, 1906, to January 2nd, 1907, I was absent from the Station on a trip through Europe, Asia and around the world as agricultural explorer for the United States Department of Agriculture. The itinerary included England, Denmark, Norway, Sweden, Lapland, Finland, Russia, Siberia, Northern Manchuria and Japan. A large collection of seeds and plants was secured, including material for use in fruit-breeding at this Station. My main object in this, my third trip to Russia, was to trace the northern limits of the Alfalfa plant in Asia. The interesting fact was ascertained that far north of the northern boundary of the common alfalfa clear across Asia, a yellow-flowered alfalfa was found which it is hoped will extend the alfalfa belt much further north on the North American continent than is the case at present.

During my absence the field work was in charge of my foreman and assistant, Charles Haralson; and the greenhouse under the charge of the florist, F. C. Stoltenberg, both of whom performed their duties in a satisfactory manner under the guidance of the Director.

Some remarkable results have been obtained during the past season from the long continued experiments in breeding hardy orchard and small fruits for the prairie Northwest.

In small fruits one of the new seedlings, the Sunbeam raspberry, has proved to be especially desirable and plants were distributed for the first time in the spring of 1906. This is one of our hybrid seedlings, resulting from a cross of the wild red raspberry of Cavalier county, North Dakota, with Shaffer's Colossal, a large, purple-canied variety from New York, the wild Dakota raspberry being the female parent.

The Sunbeam has proven perfectly hardy without winter
protection at this Station and hence may fill a long-felt want among the raspberry growers of several Northwestern states. Three hundred and twenty-five new seedling, hybrid raspberries were selected in the fall of 1906 and have been set fruiting plantation for further competitive trial. So far seven thousand seedling raspberries have been fruited at this Station in the effort to obtain a variety that will not need laying down for winter protection and we have seven thousand more coming on from seed sown this spring. The numerous hybrid strawberries of wild and tame ancestry originated at this Station, have done very well the past season. We have reduced the number largely so as to propagate only from the best few.

The past few wet seasons have been unfavorable to our native sand cherry (Prunus Besseyi). It is a valuable summer fruit for dry soils and climates but suffers from mildew in moist climates and is unproductive on low, rich land. Last fall a plantation of twenty-five thousand seedlings of the third generation under cultivation was destroyed. Some of the largest of these bore fruit an inch in diameter and of good quality. A patch of the fourth generation seedlings comes into bearing this year. These selected plants are propagated for further trial by budding on native plum roots. Of those so far secured, the Sioux Sand Cherry, (South Dakota No. 3,) has proven especially promising, owing to its good quality and productiveness.

In the spring of 1907 we distributed the first plants of our cross between the native South Dakota Sand Cherry (Prunus Besseyi) with the large fruited apricot plum from China (Prunus Simoni). The plant bears freely on one year wood, fruit an inch and three-eights in diameter and of good quality for eating out of hand. The size may increase as the plants get older. The sand cherry is the female parent. What may be termed a half brother or half sister to this new hybrid is a hybrid that fruited last year for the first time on two year old trees in nursery row. This new hybrid is a cross between our native northwestern plum, (Prunus Americana) with Prunus Simoni from China. The tree exceeds in rapidity of growth any plum, tame or wild, on the station grounds. Three year old trees in crowded nursery row being up to twelve feet in height, heavily branched. The
fruit so far is an inch and a half in diameter with very firm flesh, remarkably fragrant and of excellent quality. The rich fragrance it has inherited from its male parent, the Chinese apricot plum. Wild plums have too much free pulp and none of them have the firm flesh of the cultivated apricots and plums of Europe and Asia. Hence this remarkable hybrid may fill a long felt want.

An effort is being made to improve our native wild plum by selecting without crossing. Out of six thousand seedlings that have borne fruit here, fifteen varieties have been selected and a few trees were sent out for further trial elsewhere last spring.

While our main efforts must be devoted to fruits, owing to the urgent need of a hardier fruit list than we have at present, still it is not best to neglect hardy ornamentals. Hence I am pleased to report that our work in hybridizing the Siberian and wild roses with the best tame varieties is meeting with a good measure of success and one variety is being propagated for distribution.

Three bulletins were issued during the year, Nos. 102, 103, 104, covering the work with evergreens, strawberries, raspberries, blackberries and dewberries.

In order to obtain the best results from fruit breeding experiments the work must be conducted on a large scale and I wish to express my appreciation of the cordial support and encouragement the work has received from those in authority.

Respectfully submitted,

N. E. Hansen,
Horticulturist.

Department of Chemistry.

Director James W. Wilson,
Dear Sir:—

The work for the Department of Chemistry during the fiscal year ending June 30th, 1907, has been largely a continuation of the work of the previous year. In addition, co-operative work with sugar beets is now well installed, the Bureau of Plant Industry, U. S. Department of Agriculture, furnishing the labor
for growing the beets, while this department oversees the work and makes the necessary chemical analysis.

In the work on digestion coefficients additional grains and grasses have been taken up. The plan of procedure of the present year has been changed slightly, i.e., a larger number of sheep have been used in each trial in order to reach a more certain average. The analytical work is finished and the computation of results is in progress.

The proposed work with horses did not materialize owing to a lack of a suitable feeding place. It is recommended that suitable quarters be provided for the coming year and that horses adapted to the experimentation be purchased.

In the work with sugar beets the object is to grow and originate seeds from beets that have a greater weight and a higher sugar content than the beets commonly grown in the United States for sugar making purposes. This work is well under way in spite of the unfavorable, late, cold, wet season. Twenty-six different varieties of the best strains procurable are now growing on our breeding plats.

The work the coming year will continue along the same lines. Very respectfully,

JAS. H. SHEPARD.
Chemist.

Veterinary Department

JAMES W. WILSON, Director,
South Dakota Experiment Station.

DEAR SIR:—

I have the honor to submit the following report of work performed by the Veterinary Department for the past year:

Under the provisions of the Hatch Act a co-operative experiment with the Bureau of Animal Industry in the treatment of scabies in sheep has been prosecuted. This particular feature of the work is now drawing to a close, and with the completion of an experiment as to the length of time during which a particular pasture or lot may be capable of transmitting infection, the results will be ready for publication.
Under the provisions of the Adams Act an investigation of actinomycosis or "lumpy jaw" in cattle has been undertaken. Owing to lack of facilities in the housing of animals, work has of necessity been confined to the laboratory diagnosis of available cases as reported in this immediate vicinity. With the completion of an experimental building, now in the process of construction, the scope of the work will be enlarged to include the cultural characteristics of the disease and methods of infection. The results so far obtained warrant the conclusion that under favorable conditions there is the possibility of solving certain problems with reference to the nature of this affection that are at present largely in dispute.

Very respectfully,

E. L. Moore.

Department of Agronomy

Director James W. Wilson,
South Dakota Experiment Station.

Sir:—

The many lines of work in the Agronomy department for the year ending June 1907, were, as in previous years, crop rotation, cereal adaptation and improvement and yield and acclimatization tests of forage plants together with their breeding. In addition to this work the department was in March given control of the Highmore Sub-Station.

The year was on the whole a very favorable one for experimental work with farm crops. None of the crops suffered from vicissitudes of climate and all crops were as a rule very free from attacks of disease.

The foregoing truths make the results from such work as crop rotation experiments of more value than similar results in less favorable seasons as they are a close index of the ability of the soil to produce crops under different methods of treatment.

The work in cereal adaptation and improvement at both the Brookings and Highmore Stations was as formerly in cooperation with the U. S. Department of Agriculture. About the same number of varieties of grain were under trial as in the pre-
ceeding year. From year to year the poorest varieties are discarded and new discoveries or importations introduced to take their place. More clearly than ever was brought out by the results of the past year the superiority over the commonly grown varieties of the two introduced varieties of oats, the Swedish Select and the Sixty Day. The newly introduced Bearded Red Fife wheat also made good its claims to superiority over the best varieties of Fife and Blue Stem.

The work begun last year in testing the relative value of heavy and light weight seed wheat was continued. From the crop produced from the heaviest seed was selected heavy seed, while the crop produced by light seed was sown without grading or selection. While the first year’s results showed a very marked benefit from grading seed wheat and using only the heaviest kernels, this advantage was not maintained during the second year, the yield from the two plats being practically the same.

The investigation of several questions under a plant-breeding project, financed by the Adams fund has been begun. With corn we are investigating the relative value of selecting seed from the crib, of selecting seed from the best rows in the ear-row method of breeding, and of saving a portion of each of the breeding ears and using those that prove the best as a foundation stock from which to start new varieties or strains. Our work is calculated, too, to furnish evidence on the question of whether seed corn should be grown on ground that is either poorer or richer than the ground on which the crop is to be grown. Still another question under investigation in this project is the relation of strength of germination and amount of early growth to production.

With winter wheat we are attempting to find whether or not there is any connection between botanical characters and hardiness and production. By exchange of seed between here and Highmore we are studying the effect of natural selection in increasing the hardiness of winter wheat. The results already in hand promise some very interesting developments in this line of work. In spring wheat the inheritance of rust resistance in both selections and hybrids is the principal question under
investigation. In addition to this extensive work is being done in studying methods of breeding.

In the work with forage crops which was transferred to this department in the spring of 1906, we are testing the value and adaptation of about sixty varieties of clover and alfalfa from different sources, testing the value and permanency of different mixtures of clover and alfalfa with brome grass and timothy, doing some work with sorghums, cow peas and soy beans, and have begun breeding work with alfalfa, medium red clover, brome grass and timothy.

**Highmore Sub-Station**

During the year the work in crop rotation and cultivation experiments in co-operation with the U. S. Department of Agriculture was largely increased, but of course no results of value could be obtained from such work the first year.

The methods of work, together with some of the results obtained with grasses and forage crops have been reported in Bulletin No. 101. Work along these lines is quite closely centered upon the improvement of brome grass, the amelioration of western wheat grass and slender wheat grass, breeding millet, the improvement of hardy strains of alfalfa especially in the matter of seed production and breeding sorghum for earliness.

A study is being made of the time of breaking brome grass sod and the methods of handling it after it is broken.

Corn breeding, together with tests of native and introduced varieties occupies a prominent place. Results obtained emphasize strongly the advisability of planting only native varieties of corn, or varieties thoroughly acclimated and adapted to local conditions.

Experiments with wheat, oats, and barley are along the same lines as with those grains at the Brookings Station.

With the change in management, due to the resignation of Prof. W. A. Wheeler in March last, there was no great change in the policy of the station or in the methods of work. The most
important additions to the work this year was the introduction into test plats of a considerable number of varieties of non-saccharine sorghums and of sugar beets.

Respectfully submitted,

JOHN S. COLE.

Assistant Agriculturist in Charge of Agronomy.