1901.

NEW ZEALAND.

# EDUCATION:

# CANTERBURY AGRICULTURAL COLLEGE.

("THE CANTERBURY COLLEGE AND CANTERBURY AGRICULTURAL COLLEGE ACT, 1896.")

[In continuation of E.–11, 1900.]

*Presented to both Houses of the General Assembly by Command of His Excellency.*

*Visitor.*—His Excellency the Governor.

*Board of Governors.*

Appointed by His Excellency the Governor—John Rennie.
Elected by members of the Legislature—George Jameson, Robert Rainey, Hon. Edward Cephas John Stevens (Chairman).
Elected by governing bodies of agricultural and pastoral associations—W. F. M. Buckley, H. A. Knight, Robert Heaton Rhodes.

*Staff.*

*Director.*—J. Bayne, M.A., B.Sc. in Agric.
*Lecturer on Chemistry.*—G. Gray, F.C.S.
*Lecturer on Natural Science.*—F. W. Hilgendorf, M.A., B.Sc.
*Lecturer on Applied Mathematics.*—M. Guerin, C.E.
*Lecturer on Veterinary Science.*—J. R. Charlton, M.R.C.V.S.

## REPORT OF THE DIRECTOR.

SIR,— Canterbury Agricultural College, Lincoln, 31st December, 1900.

I have the honour to report in outline on the work done in the college and on the farm for the year ending 31st December, 1900.

*College.*—During the year twenty-five students were enrolled. This number is the smallest attendance at the college during the seven years of my directorship. On five occasions during the previous fourteen years of the existence of the college, the number of students fell below this, and once the numbers were as few as this year. As in former years, the interests of students have been carefully seen to. The walls of the large dining-room have been painted; the smoke-room has been papered and laid with linoleum; the studies are in first-class order; also the bedrooms. A pleasing feature is seen in the extraordinary care manifested by students in making their studies abodes of comfort and beauty. This they do at their own expense, and I consider it as an index of the *esprit de corps* they cherish regarding the college. The year's work has with very few exceptions been most satisfactory, as is instanced by the reports of examiners, in nearly all the subjects of instruction.

Scholarships were awarded to two first-year students, and to two second-year students. Four prizes were given for scientific work, and four for practical farm-work.

No change has occurred in the teaching staff; the lecturers, Messrs. Gray, F.C.S., Guerin, C.E., Hilgendorf, M.A., B.Sc., and Charlton, M.R.C.V.S., being respectively in charge of the chemical, natural science, mathematical, and veterinary science departments.

*Farm.*—The farm is in satisfactory order. As in former years, great care has been taken to prevent the growth and seeding of weeds. The gorse fences continue to improve, and in a year or so, should the improvement continue, will, with judicious attention, again be restored.

The cereal crops were good, and yielded satisfactorily. The yield of beans and peas was comparatively small. The linseed crop yielded about 40 bushels per acre. The cereals for the year 1901 look well, but, owing to the comparatively wet season, will, excepting oats, yield unsatisfactorily. The year's hay crop was first-class and yielded heavily. Of the root crops, mangels, carrots, and beet were fair. Turnips were not a satisfactory crop. The potato crop, consisting of thirty-nine different kinds, was fairly satisfactory. The rape crop is good.

Numerous and important experiments in connection with the above crops were carried out. These experiments have all appeared in the Canterbury papers, and will now be circulated throughout the colony in pamphlet form. Over one hundred experiments are under way this year. An experiment to test which is the best ram to use on the Lincoln-merino ewe in order to secure

the most profitable lambs for freezing purposes was again tried, and the results carefully worked out and tabulated. The same experiment is being tried again (1900–1901). Also experiments with sheep to be fed on turnips, with and without dry food, are to be tried next year (1901).

During the early part of the year grass was scarce, but later on and throughout the summer there was a superabundance of it, in fact much beyond the requirements of our stock. The winter was exceedingly mild, and all classes of stock were brought on to spring-time in first-class condition.

The live-stock continue to improve. Nearly all the shorthorn cows are first-class pedigree animals. Specimens of the Hereford, Jersey, Aberdeen-Angus, and Ayrshire are still kept for educational purposes. The Berkshire pigs are very good, and are all pedigree animals. An increasing demand for the college stock is manifesting itself from all parts of the colony. The six different breeds of sheep—Border Leicester, English Leicester, Lincoln, Shropshire Downs, South Downs, and Romney Marsh—are high-class representatives of these breeds. The live-stock, more especially sheep, have been reduced in number, and are as follows: Cattle, 87; sheep, 1,065; horses, 12; pigs, 28 (5 in pig); fowls, 166. This year, practically, no purchases of live-stock have been made, excepting two Berkshire boars, a Border Leicester ram, and a shorthorn bull.

As heretofore, a number of improvements for the intrinsic betterment of the farm have been effected, and a large amount of tree-planting has been done, over one thousand trees having been planted. With judicious thinning-out and felling of the larger pine trees, the beauty of the plantations and the surroundings of the college will be greatly enhanced.

I have, &c.,

The Hon. the Minister of Education, Wellington. J. Bayne, Director.

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Statement of Receipts and Expenditure for the Year ending 31st December, 1900.

*Farm Account.*

| *Receipts.* | £ | s. | d. | *Expenditure.* | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| Rent of land | 5 | 0 | 0 | Farm wages (including share of Director's salary) | 844 | 0 | 2 |
| Sales of Grain, &c.— | | | | Students' labour | 16 | 7 | 3 |
| Wheat | 302 | 6 | 4 | Trade accounts — Repairs, corn-sacks, freights, harness, hardware, sundries | 285 | 8 | 3 |
| Barley | 55 | 15 | 5 | Seeds | 48 | 16 | 7 |
| Oats | 72 | 4 | 11 | Manures | 25 | 15 | 1 |
| Mangel seed | 0 | 0 | 6 | Fuel | 9 | 3 | 3 |
| Linseed | 7 | 12 | 5 | Rates | 34 | 12 | 0 |
| Potatoes | 33 | 16 | 0 | Insurance | 39 | 1 | 4 |
| Sacks | 24 | 18 | 6 | Implements | 28 | 8 | 6 |
| Sales of Live-stock— | | | | Purchase of Live-stock— | | | |
| Sheep | 765 | 12 | 0 | Sheep | 225 | 6 | 3 |
| Cattle | 147 | 7 | 2 | Cattle | 8 | 8 | 0 |
| Pigs | 172 | 4 | 7 | Horses | 91 | 6 | 0 |
| Horses | 179 | 4 | 4 | Pigs | 7 | 11 | 0 |
| Sale of dairy produce | 137 | 15 | 9 | Permanent improvements | 83 | 17 | 3 |
| Sale of wool | 177 | 17 | 5 | Lochhead's drain | 5 | 18 | 3 |
| Trade accounts—Sales of poultry, eggs, &c., and charges for dipping sheep | 73 | 15 | 8 | Repairs to gates and fences | 135 | 15 | 6 |
| Farm contingencies—Prizes at shows, rebate on carriage of stock | 30 | 9 | 7 | Repairs to cottages | 55 | 6 | 2 |
| Students' labour—Refund | 5 | 9 | 0 | Repairs to farm buildings | 61 | 15 | 2 |
| Implements—Sale of old implements | 1 | 0 | 0 | Farm contingencies—Expenses at shows, veterinary medicine, &c. | 64 | 7 | 9 |
| Repairs to gates and fences—Refund | 10 | 11 | 7 | Balance carried to General Account | 131 | 17 | 5 |
| | £2,203 | 1 | 2 | | £2,203 | 1 | 2 |

*General Account.*

| *Receipts.* | £ | s. | d. | *Expenditure.* | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| Interest on capital | 1,165 | 0 | 0 | Balance, 1st January, 1900 | 153 | 17 | 1 |
| Students' fees | 790 | 10 | 0 | Salaries of Director and staff | 1,363 | 17 | 7 |
| Students' penalties | 0 | 14 | 0 | Library — Books, periodicals, &c., purchased | 39 | 2 | 4 |
| Rent of reserves | 1,541 | 15 | 8 | Students' travelling-expenses | 8 | 10 | 0 |
| Students' books | 15 | 13 | 10 | Stationery, stamps, and telegrams | 89 | 0 | 5 |
| College buildings—Refund for damages | 3 | 7 | 3 | Students' books | 26 | 14 | 5 |
| Grounds—Sale of firewood | 0 | 4 | 8 | College building—Repairs, &c. | 73 | 12 | 5 |
| Laboratories—Refund for apparatus | 4 | 0 | 0 | Grounds—Labour, trees, &c. | 105 | 4 | 11 |
| Orchard—Sale of fruit | 2 | 2 | 6 | Insurance, college buildings | 40 | 19 | 0 |
| Workshops material and tools—Sale of old iron, &c. | 4 | 5 | 9 | Travelling-expenses of members of board | 21 | 9 | 0 |
| Maintenance of students and staff—Refund for board of Director, damages, &c. | 63 | 13 | 1 | Legal expenses | 24 | 9 | 2 |
| Balance from farm account | 131 | 17 | 5 | Prizes and certificates | 24 | 1 | 6 |
| Balance at 31st December, 1900 | 116 | 18 | 8 | Laboratories—Apparatus, chemicals, &c. | 97 | 14 | 0 |
| | | | | Printing and advertising | 138 | 11 | 11 |
| | | | | Contingencies (college), including locks and keys, guarantee premiums, &c | 49 | 8 | 3 |
| | | | | Experimental work — Labour, apparatus, &c. | 55 | 7 | 4 |
| | | | | Orchard—Labour, spraying-apparatus | 74 | 14 | 9 |
| | | | | Workshops— | | | |
| | | | | Wages | 71 | 4 | 3 |
| | | | | Materials and tools | 28 | 1 | 8 |
| | | | | Examiners' honoraria and expenses | 68 | 5 | 0 |
| | | | | Scholarships—Three of £20 each | 60 | 0 | 0 |
| | | | | Contributions to churches | 20 | 0 | 0 |
| | | | | Maintenance of students and staff | 1,180 | 17 | 10 |
| | | | | Bonus to overseer on resigning after fourteen years' service | 25 | 0 | 0 |
| | £3,840 | 2 | 10 | | £3,840 | 2 | 10 |

*Capital Account.*

| *Receipts.* | £ s. d. | *Expenditure.* | £ s. d. |
|---|---|---|---|
| Balance 1st January, 1900 .. .. | 20,768 12 4 | Charges on seal .. .. .. | 2 7 1 |
| Sale of portable engine .. .. | 114 0 0 | Freight and charges for fitting up threshing plant .. .. .. .. | 212 3 1 |
| Refund of imprest for purchase of seal .. | 2 9 0 | Additions to threshing plant and erection of same .. .. .. | 82 15 6 |
| | | Balance 31st December, 1900 .. .. | 20,587 15 8 |
| | £20,885 1 4 | | £20,885 1 4 |

*Mortgage of Freehold Account.*

| *Receipts.* | £ s. d. | *Expenditure.* | £ s. d. |
|---|---|---|---|
| Balance .. .. .. .. | 20,000 0 0 | Loan on security of 6,001 acres .. .. | 20,000 0 0 |

*Statement of Balances.*

| *Accounts.* | £ s. d. | *Bank and Investment.* | £ s. d. |
|---|---|---|---|
| *Cr.* Capital Account .. .. .. | 20,587 15 8 | *Cr.* Drawing Account .. £991 13 6 | |
| *Dr.* General Account .. .. .. | 116 18 8 | Less outstanding cheques 568 4 7 | |
| | | | 423 8 11 |
| | | *Cr.* Cash in hand .. .. .. | 45 14 7 |
| | | New Zealand Railways—Deposit Account .. .. .. .. | 0 18 1 |
| | | Petty cash .. .. .. | 0 15 5 |
| | | Mortgage on freehold .. .. | 20,000 0 0 |
| | £20,470 17 0 | | £20,470 17 0 |

J. Bayne, Director.

Examined and found correct.—J. K. Warburton, Controller and Auditor-General.

REPORTS OF EXTERNAL EXAMINERS ON SCIENTIFIC WORK.

*Agriculture.*—Mr. George Rennie, reports as follows: The papers on the lecture work were very good, Nos. 8, 11, 12, and 1 being most excellent, and the general knowledge of the whole class was very good, with the exception of the three lowest students. Practical Work: In company with the students, I visited all fields in which cultivation had been carried out during the year, and questioned each one thoroughly as to the work done in each, the kinds of crops grown, the nature of all experiments, the manures and quantities sown, the dates when sown, &c. The majority of the students were able to give satisfactory answers to all questions asked, and displayed a good general knowledge of all farm-work.

*Chemistry.*—Dr. W. G. Evans, M.A., reports as follows: The papers received vary greatly, some (*e.g.*, Nos. 12, 11, 1, and 8) being really good, while others are very bad. On the whole the general chemistry is weak. The agricultural chemistry is better, but the answers in that part of the work show a marked tendency on the part of the students to learn their notes by heart and quote them indiscriminately. The practical work is, with few exceptions, quite satisfactory.

*Natural Science.*—Capt. F. W. Hutton, reports as follows: I set papers in botany, in entomology, and in geology and meteorology, also I held an examination in practical botany. The average obtained by the whole class in the three papers set was 39 per cent.; the marks obtained by different individuals ranging from 95 per cent. to 1 per cent. This shows a very mixed class. The results of the practical examination gave the much higher average of 60 per cent.; the marks gained by each student ranging from 92 per cent. to 25 per cent. The papers of the three or four best students were very good indeed, which can only be the result of excellent teaching on the part of the lecturer, combined with sensible appreciation on the part of the learner. On the other hand, the three worst students were very bad indeed, and the good teaching has been thrown away upon them. However, these three students did good work in naming by sight plants and seeds, so that I judge their failure in the theoretical part to be due not to want of attention so much as to inferior intellectual powers. The collection of dried plants were all fair, while those of Nos. 8, 6, 5, 13, and 15 were very good.

*Applied Mathematics.*—Mr. A. Dudley Dobson, M.I.C.E., reports: On the whole the students have done very well; the papers on mensuration showed the lowest number of marks, and that in bookkeeping the highest. The farm books were neatly kept, and the students evidently understood and took an interest in the field-work I gave them to do in practical surveying.

*Veterinary Science.*—Mr. C. J. Reakes, M.R.C.V.S., reports as follows: I can congratulate you and the lecturer on the very excellent grasp of their subject possessed by a portion of the students. It is, however, to be regretted that others, fortunately few in number, appeared to have taken absolutely no interest whatever in this important section of the college curriculum, for there can be no other possible explanation for the absolute lack of knowledge of even elementary facts exhibited by them.

*Practical Farm Work.*—Mr. Richard Wright, examiner in practical farm-work, reports as follows: We commenced work at 1 o'clock, with a good team of horses, in an average crop of wheat, continuing work up to 6 o'clock. I gave each student a trial with the reaper, afterwards they all did some stooking separately. Students, I consider, did well. They must have

been carefully instructed to do this work so skilfully. Their answer to question *re* altering machine for cutting different crops was also creditably given.

Mr. William Chamberlain, examiner in threshing-work, reports as follows: Eleven students were presented by the Director. Two stacks of pearl wheat had been reserved for the examinations, the stack being neatly built and well topped, though on the top being taken off I found they were rather flatly built, and that the middle, too, should have been kept fuller. The threshing plant appeared to be in very good order and well managed. Whilst keeping a general look-out on all, my attention was specially fixed on the students forking into the combine, the students feeding, and the students sewing the sacks. When I was satisfied that each student had a fair trial, the whistle was blown, and the students changed until ten had been examined. The eleventh student, who was physically unable to take part in the work, I examined in theory, and was satisfied that he had a good knowledge of practical requirements. I considered, on the whole, the examination was most satisfactory. While some students showed general activity, others were very careful and did their work well; the students had evidently had good training. The prompt way in which each student did as bid showed beyond doubt that an excellent spirit, good will, and respect existed between instructor and student.

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