ANNUAL REPORT

OF THE

ONTARIO

SCHOOL OF AGRICULTURE

AND

EXPERIMENTAL FARM,

FOR THE YEAR ENDING 30TH SEPTEMBER,

1875.

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1875.

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REPORT

OF THE

ONTARIO SCHOOL OF AGRICULTURE

AND

EXPERIMENTAL FARM.

FOR THE OFFICIAL YEAR ENDING 31ST DECEMBER, 1875.

ONTARIO SCHOOL OF AGRICULTURE,
GUELPH, November 16th, 1874.

To the Honourable the Commissioner of Agriculture:

SIR,—I have the honour of submitting to you the following Report of the Ontario School of Agriculture and Experimental Farm for the official year beginning 1st November, 1874, and ending 31st October, 1875, being the first regular year of its existence. I shall divide it into the six following sections:—

A. INTRODUCTION.
1. THE SCHOOL.
2. THE FARM.
3. THE FINANCIAL STATEMENT.
4. RESULTS AND RECOMMENDATIONS.
5. APPENDICES.

A. INTRODUCTION.

Before proceeding to record the operations and results of the past year's work, in order to understand thoroughly their scope and aim, it may be well to call to remembrance the reasons which led to the establishment of this Institution, the ends it is expected to secure, and the manner in which it is to be employed in order to accomplish those ends.

In the first place, then, it was evident to the most cursory observer that Canada depended, and would be obliged for many years to depend, largely, if not exclusively, on her raw produce for her national wealth. And amongst the various forms of raw material none were so valuable as those included under the head of agricultural produce. To observant statesmen it was plain that the readiest manner of increasing the national wealth was by increasing the quantity and quality of that produce. But, though

plainly seen, it was not so easily accomplished. Precedent, prejudice, and general conservatism stood in the way. Though throughout the Province there was a powerful minority of intelligent, enterprising, and successful farmers pursuing an improved system of cultivation, yet the great majority were depending solely on increased acreage for increased returns. This could not last, and, looking to the near future, the various means of producing increased returns from the same acreage were earnestly discussed by thoughtful men. There were two main difficulties in the way, arising from two different classes of agriculturists. The one class, like the earlier settlers, pursued no system, followed no fixed rotation, placed in and took out what the land, rich or impoverished, afforded them, and, unaccustomed to consecutive thinking, blamed the seasons or Providence for the smaller yearly returns. The other class were thoughtful, intelligent farmers, well able to trace the relation of cause and effect in their action and reaction on soil and crop; well read—knowing that in other countries land not half so valuable was yielding double returns by a system of improved farming. The means of improvement they knew, but how to procure them, or if procured adapt them to this country, was the question. Improved seeds, improved stock, improved methods of cultivation—all were wanted. But these involved climatic trial, trial involved failures, failure involved loss of capital, and the capital to lose few in this new land possessed. Here, if anywhere, even on the most rigid grounds of political economy, was a sphere for indirect governmental action. On the one hand was the certainty of diminished returns; on the other the possibility of increased receipts. To make the certainty an impossibility, and to make the possibility a certainty, the government took indirect action. They determined, to a certain extent, to meet the wants of the second class; and if not the desire, at least the results of the action of the first. They determined that with regard to the latter it should not be the fault of their rulers if the sons were not better producers than their fathers; and with regard to the former, that the loss incident on experiments that were to benefit the country at large should be borne by all that were benefited; and that the intelligence, enterprise and energy of the producer should be spent on that which had already been proved successful. Those were the reasons for the establishment of such an Institution as this.

Its objects, as will be readily seen from the foregoing statement, must be twofold. It must, in the first place, teach to the succeeding, if not the present, generation the most improved methods of cultivation—in one word, "train young men in the science and art of improved husbandry;" and in the second, it must conduct experiments and publish the results.

Finally, the manner in which the place is to accomplish those ends is twofold: (1.) By experimenting. This requires that a certain portion of the farm be made ready as an experimental portion, and when ready be used as such. (2.) By teaching: And that in two ways, indirect and direct. The first demands that as youth is taught almost more by example than by precept, that the farm shall be made in every conceivable way a "model farm," in order that the youths may absorb, as it were, by attention and practice, the methods of improved cultivation until in their case they become principles of action. The second demands that there should be direct teaching, in classroom and field, of everything relating to agriculture, whether those requisites be theoretical or practical.

Such are the reasons for, such the ends to be served by, the existence of the Ontario School of Agriculture and Experimental Farm; and such is the manner in which that Institution is to accomplish those ends.

Descending now from the abstract to the concrete, allow me to close this introduction by a brief description of the instrument to be used—the farm itself.

The farm consists of part of lots 6, 7 and 8 in the 1st concession; lots 6, 7, 8 and 9 in the 2nd, 3rd and 4th concessions of Division G, of the Township of Guelph, together with 50 acres in the Township of Puslinch, all in the County of Wellington. It contains exactly 550 acres. It is situated one mile and a half from the centre of the Town of Guelph. In general appearance the land is undulating, the farm being composed of three gently rising slopes with the level land lying between. Beginning from the east, the first slope is crowned with a grove of trees some twelve acres in extent, the second by the College and Farm Buildings, and the third by another grove of ten acres. In the valley between the first and second runs the macadamized road from Guelph to Hamilton. From the road, the second slope gently rises until the Buildings are reached. The situa-

tion is in every respect all that could be desired. The soil may, in general, be characterized as a gravelly loam, varying in richness, according to the variations of the subsoil, through all the forms of gravelly loam inclining to gravel, to sand, to marl, to clay. The variety is of great importance for the purposes to which it is to be placed.

The Institution was opened on the 1st of May, 1874, and last year's report contains a record of the operations both of the School and Farm up to the 1st of November of the same year.

I shall now proceed with that record, and, as it lies more immediately in my way, I shall commence with the School.

I. The School.

1. *In the Class-room.*

By reference to last year's Report it will be seen that the instruction given in the class-room during the fall of 1874 was based on no fixed plan, but consisted of two daily lectures delivered by myself—one on Botany and one on Practical Agriculture. The subjects embraced in those lectures will be clearly seen by a reference to the papers found in Appendix A, the questions contained in which were answered by the pupils in a two days' written examination held immediately before Christmas of last year.

The result of the examination was highly satisfactory, and encouraged us in making greater efforts to obtain for the pupils, especially during the winter months, that amount of education which, owing to the unfortunate troubles of the spring and summer, they had been unable to acquire. Acting on the recommendations I had the honour of making to the Commissioner of Agriculture (*vide* Report of Commissioner of Agriculture for 1874), the School was during the Christmas vacation thoroughly organized; the curriculum laid down, the subjects of study divided into distinct departments, and, with some difficulty, a lecturer obtained for each department. By the 1st of January, 1875, we were able to issue the circular or prospectus contained in Appendix B, which may be given, as it explains—better than any mere description can do—not only the basis on which the class-room instruction has since been conducted, but furnishes in a compact shape all the information regarding the School which is or may be required.

The Winter Term opened with twenty-eight pupils in attendance—all that could be crowded in. They came from widely scattered portions of the Province, and were of various creeds, as the following tables will show:—

Counties.	*Pupils.*	*Counties.*	*Pupils.*
Brant	1	Northumberland	1
Carleton	1	Oxford	4
Elgin	1	Simcoe	2
Grey	1	Renfrew	1
Halton	1	Wentworth	1
Frontenac	1	Wellington	2
Lincoln	2	York	1

Toronto City	3	Pupils.
England	4	do.
Nova Scotia	1	do.

Denomination.		
Episcopalian	14	do.
Presbyterian	10	do.
Wesleyan Methodist	2	do.
Baptist	2	do.

The class-room instruction was continuous throughout the winter months. Dr. Baptie and myself delivered two daily lectures each on the subjects of Chemistry, Physiology, Botany, Zoology, Book-keeping, or Mensuration.

Professor Buckland and Dr. Grange, V.S., delivered tri-weekly lectures on Agriculture, and the Anatomy and Physiology of Farm Animals.

Rev. Dr. Burnet gave occasional lectures on Horticulture.

In most of the classes there were daily oral and monthly written examinations.

The great majority of the young men showed, by their attention to lectures and diligence in study, that they were both willing and anxious to obtain all the instruction that could possibly be afforded them during the time they remained at the Institution. At the close of the Winter Term the students were subjected to a rigid written examination extending over six days. The papers used are contained in Appendix C. They are given that there may be plainly seen both the details of the subjects on which lectures were given, and the standard required to be reached at the end of the first year of the course.

Each lecturer examined the answers of the students on his own particular paper, and according to the results of those answers they were arranged in the class-list given in Appendix D. Those answering over 75 per cent. of the questions asked on each paper are in the first class, over 60 in the second, and over 40 in the third. All behind 40 are marked with an asterisk. From those lists the name and proficiency of each student can be obtained. Such a list need not be given annually, but is now furnished that the mode of procedure may be clearly understood. It will be seen that whilst a few fail altogether, a large proportion answer more than half the questions asked—showing that diligent study had given them an intimate acquaintance with the various subjects.

The examinations closed on Wednesday, the 14th April. On Thursday, the 15th, the annual closing day of the School was held. There were present the Commissioner of Agriculture, the representatives of the press, and the leading local agriculturists to the number of some fifty or sixty. The prizes were distributed to the successful candidates, and speeches made by leading men. After congratulating the lecturers and students, the Commissioner declared the School closed until the 1st of May.

It may be appropriate here to remark that at this meeting we were favoured with the presence and assistance of Principal Roberts. Unfortunately for the Institution, as well as for himself, he was seized during the next week with an illness so serious that, according to medical decision, resignation of his position became a necessity. It was accordingly tendered and accepted. He had impressed every one whom he met in a favourable manner, and amid expressions of desire for the welfare of the place under his charge were heard on every side congratulations on the wisdom of the Government's choice. The Institution received a blow from which it has not yet recovered by the sudden and dangerous illness which rendered necessary the resignation of its Principal.

From the beginning of March until the end of April the following advertisement was occasionally inserted in a few of the leading newspapers :—

"ONTARIO SCHOOL OF AGRICULTURE.

"The second Preparatory Term of this Institution will commence on the 1st of May, when thirty students can be accommodated.

"The new Principal, C. Roberts, Esq.—one of the leading agriculturists of England, Gold Medallist of the Royal Agricultural College—will enter upon his duties by the middle of April.

"The School is now temporarily organized. The inside departments of instruction are :—

"Agriculture, Horticulture, Chemistry, Natural Sciences except Chemistry, Veterinary Surgery and Practice, English and Mathematics.

"The outside are :—The Field, the Live Stock, the Horticultural, and the Mechanical.

"The Principal will be assisted in the former by well-qualified Lecturers ; in the latter by competent Instructors.

"By faithful work, outside and in, a student can pay for tuition, board and washing, and leave fifty dollars to his credit at the end of the year.

"For particulars regarding terms of admission, &c., &c., send for circulars to the

undersigned, by whom applications for admission will be received until the 15th of April. An early application will be advantageous, as several are on file.

"WM. JOHNSTON,
"*Rector O. S. of A.*

"Guelph, March 5th, 1875."

On the 1st of May the School re-opened. Ten of the old students remained for a second year's course, and from amongst the applicants answering the above advertisement as many had been selected as the building could accommodate.

Pending the appointment of a Principal, James Laidlaw, Esq., Warden of the County of Wellington, was appointed Farm Superintendent, and the Rector Acting Principal.

The Spring Term extended from the 1st of May until the middle of July. During that period of time, the students were in the forenoon on the farm, and during the afternoon and evening in the class-room. This was according to the plan adopted of spending during the Spring and Fall Terms one-half of the time in the class-room, and one-half on the farm, whilst in the winter almost all the time was to be spent in the former, and during the summer on the latter.

With the exception of the gentleman on Horticulture, the same lecturers were retained. Daily lectures were delivered by Dr. Baptie and myself on Chemistry, Botany, Geology, and Agriculture; and tri-weekly lectures by Professor Buckland and Dr. Grange, V.S., on Agriculture and Veterinary Materia Medica respectively. Daily oral and monthly written examinations were held as before. Of course, from having first and second years' students, a double number of lectures became requisite.

At the end of the Term in July the students were subjected to a rigid written examination on the subjects embraced in the lectures, when only three failed to pass, and the great majority showed by the standing attained that their time for study had not been misspent.

In the summer, class-room instruction was discontinued, the students being steadily employed on the farm.

On the 4th of October, the Fall Term of the Winter Session commenced. Depending on the contractor finishing the mansard story at present being placed on the main College building by his specified time, the 1st of October, promises of immediate admittance had been made to a few. But, unfortunately, that portion of the building is not yet quite ready for occupation, so that our full quota of forty cannot be taken in for a couple of weeks at least.

The number now in attendance is thirty-two. The following tables show the sections of the Province from whence they come, and the religious denomination to which they belong:—

Counties.	*Pupils.*	*Counties.*	*Pupils.*
Carleton	1	Peterboro'	1
Elgin	1	Renfrew	1
Frontenac	2	Wellington	6
Halton	2	Wentworth	1
Hastings	1	Waterloo	2
Lincoln	1	York	1
Oxford	4	Huntingdon, P.Q	1

Toronto City	4 Pupils.
England	3 do.

Denomination.	
Episcopalian	14 do.
Presbyterian	11 do.
Wesleyan Methodist	6 do.
Plymouth Brethren	1 do.

Dr. Baptie is still retained as Lecturer on Agricultural and Practical Chemistry, and Dr. Grange, V.S., as Lecturer on Veterinary Surgery and Practice. Owing to the inability of Professor Buckland, through severe illness, to undertake his former work, the services of William Brown, Esq., a practical farmer and an agricultural author of repute, have been secured as Lecturer on Practical Agriculture. Daily lectures are now delivered to the first and second years' classes by Dr. Baptie, Mr. Brown and myself, on the subjects of Agricultural Chemistry, Practical Agriculture, and Natural History, and tri-weekly lectures by Dr. Grange, V.S., on the subjects of his department.

Having now the advantage of a fair number of works on the various subjects in the Library, the students seem to be applying themselves with fully greater zeal than before to the work of the class-room.

I cannot close this brief record of the lecture-room work for the year without referring to the able manner in which the several lecturers have discharged their respective duties. Rev. Dr. Burnet's occasional lectures on Horticulture were highly appreciated by the students. Dr. Grange, V.S., has proved himself an able lecturer, the interest manifested by all the students in his department showing the power he possesses of awakening the sympathy of the students for the subjects on which he treats. Dr. Baptie has amply borne out here the character which he obtained in Victoria College Medical School as a thorough, efficient and painstaking lecturer and teacher. His attention and study being now turned to the relation of Chemistry to Agriculture, his services promise, if retained, to be simply invaluable. And the manner in which Professor Buckland at an advanced age, in the face of difficulties which would have daunted the majority of men, with all his other engagements pressing on him, without the desire or hope of fee or reward—indeed refusing both—at once stepped into the breach, and coming weekly from Toronto, gave the students the benefit of his long agricultural experience in three lectures each successive week, is beyond all praise, and certainly merits the warmest thanks of every friend of the Institution.

Summing up, then, the results of the last nine months' work in the class-room, it may be said that during that time a curriculum has been laid down, the subjects of study divided into distinct departments, a regular and systematic course of instruction tested, its success practically demonstrated, and a basis for all future work well and safely laid. In a single sentence, the School has been thoroughly organized, and through all its departments is now running without a jar to impede its progress.

2. *On the Farm.*

The departments of instruction on the farm are four in number—the Field, the Live Stock, the Horticultural and the Mechanical. The foreman over each of those departments is expected to perform not only the work of an overseer, but likewise that of a practical instructor. The students were divided into four relays, which were alternated to each department. Thus every student became practically acquainted with the various operations going on. Each instructor was provided in the morning with the names of the students assigned to his department entered in a pass-book, which he returned every evening with the number of hours' employment, the rate of payment for each hour, and the particular kind of work done marked opposite each student's name. These items were recorded in a journal kept for the purpose. A ledger account was opened with each pupil, and he was credited at a maximum rate of ten and a minimum of two cents for every hour's work, according to quantity and quality, the foremen being the judges. A direct incentive was thus given, not only to work, but also to practical learning, for without clearly understanding the manner how, no work could be properly done, and if not so done payment was proportionally less.

The instruction received can be better described under the heading of the various departments.

(1.) The Field Department.

Little could be learned of course during the winter. Each student was made practically acquainted with the mode of handling an axe and felling trees—an advantage to many of them hereafter no doubt. Threshing with all the intricacies of horse-power,

separator, &c., came under practical review whilst the majority learned to handle the old-fashioned flail. As the spring opened up field work began to accumulate, and instruction therein hastened proportionally. The modes of preparing the land for different crops; the manures, if any, used; the various modes of applying them, were all seen; and the operations consequent thereon, participated in. A short apprenticeship to ploughing, harrowing, cultivating, and sowing was served by each. The beginning of various kinds of rotation was seen, and the work consequent upon the carrying out of a general plan understood.

As the summer came on the preparation of the land for, and the cultivation of, root-crops—carrots, mangolds, rape, turnips—was taken part in by all. Draining in all its phases became an ordinary business, and the various kinds of drains—mains and laterals—the mode of construction, depth, inclination, size of tiles, manner of laying, covering, &c., were matters of every day experience. Then came haying, but unfortunately our hay-crop proving a failure little could be learned practically in the hay-field. The mower however in all its details, its manner of working, the curing and storing of hay, was well understood by each. In the harvest proper, a pretty thorough apprenticeship in reaping, binding, shooking, drawing in, mowing and all the et ceteras was served. At present a lesson in the manner of taking up and storing root-crops is being taught.

To conclude in a sentence, in all the ordinary farm operations throughout the several seasons, the students have not only taken an active part but been instructed, and measures have been taken to see that whilst the hands were busy, the eyes were not closed nor the brain idle, but that the reason for every operation was as clearly understood as the work itself was thoroughly done.

(2.) Live Stock Department.

The winter season was of course an important one. With thirty-six head of fattening and twenty of store cattle in the stables, some eighty of fattening and twenty-five of breeding sheep in the pens, besides six pairs of horses, it will be readily seen that the manner of feeding and caring for stock was pretty thoroughly acquired. The methods of cutting hay and straw, of cutting, slicing, and pulping roots, together with the modes of mixing and feeding were learned. As the winter advanced, the care of breeding cows, ewes, and swine became an object of attention and practical study. A rather large amount of disease, principally owing to the severity of the winter, enabled the students to see the ordinary course of treatment for the commoner of the diseases of farm animals. As the spring advanced the caring for foals, lambs, calves, and litters was taken part in. The selling of the stock, the manner thereof, the prices obtained were noted by each, and this together with attendance at the monthly fairs for which Guelph above all the other towns in Ontario is noted, gave a fair idea of the trade in stock. As the summer came on, the care of stock took up less time and required less work. But practical instructions were received by the students in the shearing and hurdling of sheep, and the soiling and grazing of cattle. As the farm was stocked this summer with sheep, the characteristics of three leading breeds in the Province were brought directly under the notice of the students whilst the characteristics of four of the leading breeds of cattle were obtained partly at home, and partly by visits to the herds of the leading farmers in the vicinity. Considering the nature of youth, it may be useless to remark in conclusion, that of all the kinds of instructions on the farm none is sought after with greater avidity than that which leads to the handling of horses, cattle, &c., and in no branch of practical husbandry will instruction be easier or has it been more rapid than in that included under the name of Live Stock.

(3.) The Horticultural Department.

A small propagating house, with a smaller work-shop and tool-house attached, was the scene of the winter's operations in this department. Here, however, the students became acquainted with the manner of propagating and forcing plants. The various soils used, the processes of cutting and budding, the insects attacking the plants at this stage, and the means of combatting them, the caring for, selection, and arrangement as regards light and heat were all learned. They were also engaged in the construction of various kinds of rustic work for garden ornamentation, and learned the names

of most of the plants, shrubs and trees by marking labels for each. As the spring opened, the construction of hotbeds, the making of compost-heaps, the pruning of the various orchards and hedges, grafting, transplanting of plants, trees and shrubs, were the subjects of practical instruction. With warm weather came the preparation of the soil for, and the sowing of the various garden vegetables, beets, carrots, cabbage, cauliflower, cucumbers, citrons, celery, parsnips, tomatoes, onions, &c., &c. ; and as the summer advanced the mode of culture most appropriate to each was learned. The pupils were also instructed in the methods of laying out flower beds and borders, preparing the soil for, and sowing the commoner annuals, the transplanting or removing of biennials and perennials.

The insects attacking the trees and plants together with the modes of destroying them were practically studied. In carrying out the plans laid down last fall, a great amount of road-making had to be done this summer. In laying out, grading and gravelling carriage drives and garden walks all took an active part. The modes of gathering and storing the usual varieties of apples, pears and other fruits, and the different kinds of garden vegetables has just been learned, and the students are now engaged in preparing for the erection of a greenhouse, and the various structures connected with it, so as to be ready when the spring of 1876 opens.

A knowledge of garden operations sufficient to enable the students to cultivate successfully and profitably, if not a market, at least a kitchen garden has been obtained—a knowledge which will enable them, should they obtain farms of their own, not merely to add to their economical resources but to furnish to themselves and families comforts with which many of our farm households are not supplied, simply for want of the knowledge requisite to obtain them.

(4.) The Mechanical Department.

During the winter the students learned pretty thoroughly how to handle every species of carpenters' tools, as there was performed a quantity of inside repairing in the houses and outbuildings, which had been specially left until the winter season. The farm and garden implements and tools needing repair were thoroughly overhauled, their principles of construction not only understood but practically learned by their assisting in repairing the majority, and even making quite a few of them. When spring came the general repairs and permanent improvements of the place were proceeded with. The method of making hurdles, building gates of various descriptions, erecting fences of different kinds —board, picket and wire—the preparing of paints, and painting in various colours were learned by constant practice. There are few of those who have been here for the last six months who cannot take up and work with almost any kind of carpenter's tool, or proceed to repair any building, gate, fence, or the woodwork of every common farm implement or tool.

No species of knowledge is more urgently required by the majority of farmers than this, and nothing will to a greater extent serve the purposes of economy on a farm than an ability and readiness to keep everything in order by repairing at once any breakage in house, outbuilding, fence or implement. And therefore we conceive that the instruction received in this department of practical work whilst popular with the great majority of the students, is likewise beneficial—almost indispensable—to their technical training as farmers.

(A.) Household, Building, &c.

The household affairs have been ably conducted under the care of the efficient housekeeper now in charge.

The conduct of the students has been excellent. Violation of any of the rules and regulations have been few and far between. Punctuality at morning and evening prayers, at roll-call for work, at meals and lectures has been the invariable rule to which only now and then was there an exception, requiring the immediate imposition of a fine. All have attended their respective churches once each Sabbath—the majority twice. All have been present at the Rector's bible-class each Sabbath afternoon. The general health of all has been good, indeed the proportion of the physical and the intellectual, together with a regu-

lated diet and systematic habits, seems above almost everything else to produce a splendid physique.

A laboratory was commenced at the first of the year—partly by purchase from the Depository of the Education Department, partly from other sources. It has been found very useful—indeed indispensable—during the course of the year.

A moderate addition has been made to the library by purchases from Canada, Britain and the United States. Almost the only useful portion before was presented by Professor Buckland.

A mansard roof has been placed on the main college building, giving the whole structure a pleasing appearance. But what is of greater consequence than appearance, it increases the normal accommodation to forty.

At its meeting in July, the Executive Committee of the Agricultural and Arts Association for Ontario, ordered that the sum of four thousand dollars ($4,000), which had been voted at a previous meeting, should be directed towards the erection of a Veterinary School Building, for the Veterinary Department of this School—the building, when completed, to be handed over to the Government. Plans and specifications were prepared, tenders invited and accepted, and a stone building forty by fifty, in height two stories and a basement, is in the course of erection, and will, it is expected, be ready for occupation in December.

The Reading Room has been supplied during the year with the following papers and periodicals :—

Toronto *Globe* (daily);
" *Mail* "
Guelph *Mercury* "
" *Herald* "
Canada Farmer;
American Agriculturist;
Chicago Live Stock Journal;
Scientific American;
Mark Lane Express;
North British Agriculturist;
Irish Farmers' Gazette;
Country Gentleman

And the following periodicals are placed every Sabbath on fyle :—

Sunday Magazine;
Good Words;
Quiver;
Family Treasury;
Leisure Hour;
Sunday at Home.

II. The Farm.

It must constantly be borne in mind that the Farm is at present in a transition state. The main object to be kept in view is not so much the raising of crops, the grazing, breeding and fattening of stock, as it is to bring the Farm into shape for the purposes of a Model and Experimental Farm. The length of time necessary to do this is variously estimated. I have placed it at seven years, two of which are now past, leaving five years yet to complete what has been called the preparatory term. To sum up in a single word—the end now sought is permanent improvement. In order to accomplish this object three things were to be done. In the first place, the whole farm, which was dirty and out of order, had to be cleaned, drained and put into shape. In the second, a portion was to be separated from the rest, and set apart as an Experimental Farm. In the third, the remaining portion was to be made a Model Farm, a part kept for garden purposes, and each field of the remainder properly enclosed and placed into some particular form of rotation.

Little of this was done in 1874. It was the 1st of May ere work was begun; and, as there had been no fall ploughing, it will be easily understood that during that spring and summer, even under the best management, no great amount could have been accomplished. By reference to last year's report, the amount of land cultivated can be seen, and in Table E. of Appendix E. of this Report the amount of produce raised is given. Suffice it to say, that during the spring of 1874 there was placed under cultivation 175 acres. During the summer thirty additional acres were added, making in all 205 acres.

At the close of the season, plans were laid for the improvements to be carried out during the summer of this year. During the winter months the labour on the Farm was

confined to the usual winter routine of farm work. The road dividing the Farm in two was carried through the bush, the wood cut being used by the officers and the employees; the grain was threshed and the stock attended to. At Christmas 17 head of cattle were sold, and at Easter 19 head more. In January 68 sheep were likewise sold. The prices obtained, together with the disposition of the money, will be seen by reference to Table E. Plants were propagated in the propagating house; and in the shop all the Farm implements were overhauled, whilst all inside repairs were performed. Awaiting the advice and assistance of the new Principal, Charles Roberts, Esq., of whom mention has already been made, the details of the plans for the spring and summer work were not drawn out. As has been already stated, he was obliged through serious illness to resign ere he had been a single day in charge. This sudden change necessitated immediate action. Accordingly, temporary arrangements were made for the conduct of the place during the season; and until the appointment of another Principal, I was requested to act as Principal of the School, and Mr. James Laidlaw, Warden of the County of Wellington, was appointed Superintendent of the Farm in all its branches. Though undertaking the duties of the position with great reluctance, yet no sooner was Mr. Laidlaw put in charge than he entered upon his work with zeal, and for a part of almost every day since his appointment he has been on the place, bringing to bear his thirty years' experience as a successful practical farmer with marked results. His report of the Farm operations during the three seasons follows :—

ONTARIO SCHOOL OF AGRICULTURE,
GUELPH, November 16th, 1875.

To the Honorable
The Commissioner of Agriculture.

SIR,—I have the honour to submit my report of the farm operations of this place for the six months beginning 10th May and ending 10th November, 1875.

When I took charge of the place, it was plain to any one that the first thing to be done was to put it in order. It had to be cleaned, the fields placed into a regular rotation, and the whole changed from a stock to a mixed farm. Unsightly fences cut up and spoiled the appearance of the gentle slope on which the college buildings stood, facing the Dundas Road. Immediately past the buildings, facing the same road, were some 85 acres of natural pasture land, dotted over with stumps and small swamps. A lawn was to be laid out and the garden enlarged. Under the first Principal, the money appropriation for the purchase of stock had been invested in buying fattening cattle. These had been fattened and sold, and the nucleus of a breeding stock purchased in the shape of a few Durhams, grade cows, and Cotswold sheep. The plans laid down were carried out or modified, as seemed to me for the best interests of the place. What has been done can be best described under the heading of each of the four Departments.

(1.) *The Field Department.*

Here, the existing cultivated portion, amounting to some two hundred acres, was as far as possible to be cleaned, each field to the best of our ability placed under a regular rotation, and a large amount of the old pasture-land—and it was almost all old—broken up. To accomplish the second about eighty acres were seeded down; and to accomplish the third, forty-three acres were broken up in the spring. To this has been added twenty-five out of our forty-one acres of summer fallow, making in all sixty-eight acres broken up. There was on the place thirty acres of fall wheat, all of which, with the exception of eight, was winter-killed, and had to be re-sown. There was placed under grain crop the following acreage :—

Barley	56	acres.
Wheat	19	"
Oats	42	"
Peas	41	"
Total number of acres in grain	158	"

Immediately on these being sown, attention was turned to the root crop. The barn-yard manure, of which there was, from the quantity of feeding cattle, a large amount, was placed on the turnip-field together with manure of other descriptions. There was placed under root crop the following acreage :—

Potatoes	4	acres.
Carrots	1½	"
Mangolds	1½	"
Turnips	23	"
Total number of acres in roots	30	

There was likewise sown as forage crop :—

Rape	15	acres.
Corn	4	"
Oats and Tares	3	"
Total	22	

If to the acreage of these several crops be added forty of hay, the total number of acres under cultivation will be seen. That number is 250. To this add twenty-six acres of usual pasture land, and 276 acres, or the available land for crop, is obtained. From this simple statement it will be seen that a considerable amount of labour is yet in store.

The crops promised an excellent yield until the dry weather set in, but the drought seriously affected returns. An early frost at the beginning of June made such havoc of our timothy that when hay-time came we cut off forty acres of land but twenty-five tons of hay. The majority of the other crops turned out well. None of the grain is yet threshed, but a tolerably close approximation can be made as to the total result. By reference to Table F. of Appendix E. it will be seen that the number of bushels of each crop is estimated as follows :—

Barley	2200	bushels.
Peas	1200	"
Oats	1600	"
Wheat	300	"
Potatoes	150	"
Carrots	200	"
Mangolds	400	"
Turnips	12000	"

Barley was good, but one half slightly discoloured from the wet weather. Fall wheat a failure—almost nothing. Spring wheat a good crop ; good sample. Peas a large crop. Oats an average crop. Potatoes a failure, owing to the attacks of the Colorado beetle, but more especially to a blight which prevailed over this section of country. Carrots a poor, mangolds a fair crop. Turnips above an average. The rape was a fine crop, carrying over 160 fattening sheep.

During the summer and fall, draining operations have been extensively carried on. Three main drains, running at angles across the width of the farm, the first 260, the second 216, and the third 146 rods in length, have been opened out. These with their laterals, when fully completed, will drain the greater portion of the farm. It was thought advisable to place those laterals only in the parts where they were most urgently needed, leaving the rest of the draining to be gradually carried out. And they were placed in likewise at wide though regular intervals, in order to save expense should they be found sufficient for the purpose intended ; if not, others can be placed between, as a regular map has been kept of every field drained, with the position of each drain. In the heaviest of the three, which drains an area of fully one hundred and fifty acres, a six and a four inch tile was placed side by side, as the stream of water to be carried out by it had filled, during the spring months, an open ditch, fully a foot deep with water. The second and third mains, laid with six inch tile, have been left open for a considerable distance from the mouth in order

that it may be seen whether the tile is sufficient to carry off the flow of water. The average depth of those mains can be seen from the statement given below. Seams of various kinds of soil were cut at that depth, but none gave any trouble except the quicksand which was met with here and there. In that case every care was taken to make the drains secure. Boards were laid at the bottom of the drains, and the tiles placed on those. The tiles were securely covered either with inverted sods and straw, or both. A sufficient number of laterals to carry off all superfluous water has been laid in forty-seven acres. The following statement has been drawn out to show the average cost per rod of the various drains opened, with the different sizes of tile used. By means of it any farmer, in any portion of the country, will have at least an approximate idea of what any piece of draining he may require to be done will be worth by the rod. The prices of the various description of tile are about the same in all the yards over the Province, and the nearer the manufactory the cheaper the tile. As for ourselves, our nearest yard was at a distance of twenty-six miles, and the cost of the tile laid down at Guelph Station was $62 for 6-inch, $22 for 4-inch, $16 for 3-inch, and $10 for 2-inch. The following statement shows the number of rods laid, the size of tile used, the cost per rod at various depths and sizes, and the total amount spent up to 31st October :—

No. of rods.	Species of tile.	Average depth.	Av. price per rod.	Total cost.
261.....	6-inch and 4-inch.	4 feet 8 inches.		
144.....	6-inch.	4 " 6 "	$2.38	$621 18
196.....	4 "	3 " 9 "	1.95	280 80
544...	3 "	3 " 1 "	1.00	196 00
150..... ...	2 "	3 "	65	353 60
			50	75 00
				$1526 58

The teams have been turned in to assist in various species of permanent improvements, and the process of filling up and gravelling the Farm road, together with the ordinary farm work will occupy the time pretty fairly during the winter. It will take a few years before the several fields will be cleaned sufficiently, and put into such rotation that the place may properly deserve the name "model;" but if the grass sown stands the winter, a basis has been laid on which, with proper planning and application, that desirable end may eventually be attained.

(2.) *The Live Stock Department.*

As I have already stated, the fattening stock had been replaced by the nucleus of a breeding stock when I was appointed. Besides this, two additional pairs of horses had been purchased in the spring of 1875. As there was a large amount of pasture to be consumed, which would naturally, except the season was a moist one, die out in July, the two or three head of fattening cattle still remaining were sold off, and some 180 head of fattening sheep bought and turned on to this pasture. To subsidize the pasture from the month of August, 15 acres of rape were sown. Those sheep cost on an average $4.45 per head, and will average double the money at the lowest calculation when sold. But it was plain that what was wanted was to stock the place. The money granted was not sufficient to do this thoroughly. One cow—Louan of Brant the fifth—of the famous Louan tribe, was purchased by the Hon. Mr. McKellar, and added to our herd of Durhams. The remainder of the appropriation, after paying for her and the horses, was invested in breeding sheep. It was hardly sufficient to stock the place thoroughly, even in that one line, and we were obliged slightly to curtail. The three best breeds have been chosen as a beginning. There are now of each of those—

34 Cotswold Ewes and one Ram.
12 Leicester Ewes and one Ram.
12 Southdown Ewes and one Ram.

Some of these are imported, and what are not are from the very best home flocks.

If to the stock at present on the farm were added a few additional Durhams, a male and two females of each of the following breeds—Herefords, Ayrshires, and Devons—the

Farm would, in my humble judgment, be pretty thoroughly stocked with breeding cattle. The prevailing herd should, however, undoubtedly be the Durham, of which a male and four females should be purchased. To these should be added a male and two females of the various principal breeds of swine, as there is nothing but three Berkshire sows and one Berkshire boar on the place. The principal varieties of poultry should likewise be procured.

(3.) *Horticultural Department.*

In this department the greater portion of the labour has been spent on permanent improvements rather than on gardening. Had the latter been the main object, a market would have to be sought, as the house is by no means able to consume all the produce raised in the garden. As it is, the house is charged with more than it really requires. The old garden of about three acres was continued, and other two brought under cultivation. Both were laid out in plots, and the usual routine of garden vegetables planted. As, however the old garden is too full of fruit trees, the site of the garden has been changed, and the old site will henceforward be used as an orchard for small fruits.

The following may be taken as the produce of the kitchen garden :—

Apples	125	Bushels
Asparagus	132	Bunches.
Beans	7	Bushels.
Beets	46	do.
Cabbage	5,100	Heads.
Cauliflower	300	do.
Carrots	220	Bushels.
Cucumbers	500	
Celery	1,020	Heads.
Lettuce	150	Bunches.
Onions	21	Bushels.
Parsnips	51	do.
Peas (Early)	23	do.
Pears	4	do.
Plums	4	do.
Potatoes	120	do.
Rhubarb	140	Bunches.
Tomatoes	5	do.

Besides Melons, Squashes, Spinach, Radishes, &c., &c.

The fruit crop was light, and it is difficult for us to secure it, owing amongst other reasons to our proximity to a town. Apples were poor; trees blighted. Pears a fair crop. Plums better than usual. Our currants, gooseberries and strawberries are things of the future.

The vegetable garden was, on the whole, a decided success. It presented a fine appearance, bordered as it was by flowers. Cabbage and Cauliflower successful, Carrots average, Parsnips average, Onions good;—and without enumerating all, I may say in a word that everything that work and skill could do was done, and if the dry weather affected some species more than others the misfortune was not ours alone. Taken as a whole, the produce of four acres has been very satisfactory.

But, as I have before intimated, the main strength has been placed on permanent improvements. Two carriage drives, each 72 rods in length describing similar arcs—leading approaches from the Dundas Road—have been constructed, graded and gravelled. Upon the two have been placed 925 cubic yards of gravel. The material was found on our own place, and the work has been performed by the gardener and his class. The two acres of garden taken in have been cleaned and levelled. The orchard has been cleaned of sod and weeds, and seeded down. The field in front of the buildings has been sown with lawn grass. Another kitchen garden of five acres has been laid off and enclosed. Facing the road, ditches have been cut, and sidewalks graded, levelled, and where requisite gravelled. Maples have been planted around the lawn and garden, and

evergreens along the sides of the carriage drives. Excavation for a greenhouse and fruit-house is now being proceeded with.

From this bare record it will readily be seen that more than one-half of the work has been spent on permanent improvements; in other words, bringing into shape the twenty acres lying in front of the place, for the purposes of lawn and gardens. As on the farm the raising of crops has not been the main end kept in view, so in the garden the primary object has been rather to make a garden than to raise plants and vegetables.

(4.) *Mechanical Department.*

As soon as the spring opened, outside work commenced in this department. The various implements had been made ready for use. The several houses on the place were attended to, and are now in shape for four or five years at least. The barns, stables and outbuildings generally next received attention, and all needed repairs were performed. Some sixty hurdles, sheep-racks, feed-boxes, and all other appliances required in the grazing and feeding of stock were constructed. A picket fence 200 rods long, and a straight board fence 144 rods in length, have been built. A wire fence 70 rods in length is now in process of erection. As these fences enclose the lawn and gardens, not only had greater care to be taken in building, but the number of entrances absolutely necessary required a proportionate number of gates and surroundings. The carpenter and his class are busy at present in the erection of a fruit-house and workshop for the garden, both to be hereafter attachments of a greenhouse and conservatory.

As a considerable portion of the carpenter work of the Veterinary School building is to be performed by them, there will be no lack of work during the winter. A glance will show that all work in this department comes under the head of Repairs or Permanent Improvements—by far the greater portion under the latter.

I may say, in conclusion, that with the money and material at hand a fair amount of work has been accomplished; that a good start has been made in overcoming the work of a six years' plan; that if during the next five years as much land is improved and work done, the place will in some slight measure deserve the title of a "Model Farm." A small portion is now ready for the purposes of an Experimental Farm, and I would advise that plans be formed and purchases made this winter with that end in view, in order that next year a carefully compiled report on experiments will be added to any that may be given, similar to my own, on improvements.

I have the honour to be,
Your obedient servant,
(Signed) JAMES LAIDLAW,
Farm Superintendent.

III. FINANCIAL STATEMENT.

This is given in the several tables of Appendix E. Table A. shows the expenditure of the Institution for the ten months out of the appropriation voted by parliament; it includes both Farm and School. Some of the items are abnormal. The items under the heading of the "Farm Department" are wholly so. During the first spring of the Farm's existence no first-class seed from a different section of country had been purchased. This was done last spring. A large amount of repairs, almost though not altogether in the shape of permanent improvements, had likewise to be made. Both were a first charge, and both items can now be struck out of appropriation items, and charged, as is done in Table F., to Expenditure out of Farm Income. In the Horticultural Department likewise "plants and seeds" had to be purchased this spring, as it were, for the first time; but now, by propagating plants, and to a large extent producing our own seeds, that item can be struck out, and, with the exception of what goes into the capital account as permanent improvements, in the shape of fruit trees, &c., the amount of this item will hereafter be charged against Garden Income. The item

of "Bonus to Pupils," it is to be hoped, will likewise prove an abnormal one, and in another year, when the advantages of the School are better placed before the farming community, be done away with altogether.

Those abnormal items excluded, there will remain but the cost of maintaining the House, the Business Department and the School. What is wanted then is to arrive at a satisfactory basis for estimating the cost of maintaining each of those. Taking the first two items of "Food" and "Household Expense," which includes all under the House, there is to be struck out the expense of the Principal and lady during a six weeks' illness of the former, the cost of board for extra lecturers, and the cost of repairs incident on changes for Principal's residence. There is to be added the wages of the Matron and her servants. This being done, there is given the sum of $2,704 27. To this add the cost of the fruit and vegetables supplied by the garden, and there is found to be some $3,000 as the total expenditure, or a little over $100 as the cost of maintaining each student for ten months—say $125 for the twelve months. Were the number one hundred, instead of thirty, the individual cost would of course be less. It is slightly greater than in the majority of our other public institutions; but then the class, the age, and the occupation of the students is far different, and when these are taken into consideration, the amount can certainly not be considered extravagant. As a basis for estimating the House expenditure, one hundred and thirty dollars at the outside may then be taken as the average cost of maintaining each pupil.

The amount paid in the Business Department last year, and the amount asked for next year, are both $200 above the normal expenditure, owing to the necessity of issuing a prospectus, &c., and otherwise advertising the place. Adding to the $400 left $800, as a fair portion of the salary of the individual rejoicing in the ecclesiastical title of Rector, and we have $1,200 per annum as the normal expense of the Business Department.

The cost of the School Department of expenditures depends entirely on the staff kept, and that is a matter the decision of which must be left to other hands than mine. What is thought requisite may be seen by reference to Table B.

Looking at this table it will be seen that the only one of what is called abnormal items continued is that entitled "Bonus to pupils," which it is hoped will be shortly abolished. However, as all the students here have entered under the old regime, it must be continued for this year. The number of pupils provided for is forty, and the average cost of maintaining each pupil taken at the aforesaid amount of $130, to which total has been added $600 for repairs and incidentals. The former is asked for enlarging the washroom, relaying water pipes and repairing generally.

In considering the amount under the heading of capital account, the plan on which the amounts asked for is based must be thoroughly understood. In the first place it is considered that it will require five years more to put the place into shape for the purposes of a model and experimental farm, and that the amount of capital to be spent in doing this will not be less than $15,000. Hence the sum of $3,000 will be asked for yearly for this purpose. Again it is thought by competent judges that the lowest sum with which the place can be stocked in addition to what we have is $10,000. Six thousand of that is asked for this year, leaving $4,000 yet to be required. If the principal herd is Durham that sum will certainly not be extravagant.

At the end of five years then the place may be left to itself to pay for everything which may be required. It will then pay for labour, repairs, seeds, and interest on capital outlay. All, but the last and perhaps a little of that it will pay from this year henceforward.

There remains an item on "no man's land," viz.:—that of experiments. In any case, this will always have to be provided for by appropriation.

If this preparatory term last for five additional years, as the best practical men say it must, at the end of that period it is not too much to expect that the place will have become so fully known, and if rightly conducted the benefits to be conferred by it so thoroughly appreciated, that parents sending their sons will at least pay for their board; and that the farm will have been placed in such condition that all but the experimental portion will be self-sustaining. At the end of that period the country will have to pay only the salaries of the staff, and the cost of experiments.

During those five years however an annual outlay will have to be made in what may

be called section No. one of capital account. In section No. two—"building" all work either completed or contemplated goes into a general plan. During the present year the Veterinary School Building has been erected as one of the wings of a main building 240 feet long of which the present College Building will be the centre. The most of $13,000 asked for next year is for the erection of a Principal's residence to form the second wing of the proposed building.

Tables C. and D. require little explanation. It will readily be seen that the stock requires replenishing in the direction of cattle, pigs and poultry. As the farm grows by bringing a greater number of acres under cultivation, a greater number of implements will be required than those mentioned in Table D. But the farm's income should be in a proportionate ratio to its growth, so that all such could be purchased out of it.

Two or three items require explanation in Table E. The first section under the head of income is plain. It represents the produce of some 180 acres, all that could be brought under tillage owing to the lateness of taking possession. The full amount of section No. two should not properly be charged to farm's income. There must be substracted fro m it the cost of the cattle which was $1,998. By reference to the expenditure account it will be seen that $2,660 23 worth of stock has been purchased. The difference between this and $1,998 or $662 03 shows the amount actually invested in stock out of the farm income. The amount paid for feed and fodder was abnormal, and was owing in the first place to the lateness of occupation requiring fodder to be bought to supply the place of that which might otherwise have been grown, and in the second place to the necessity of investing in fodder to fatten the cattle purchased to a paying point.

The second part of Table E. does not represent the produce of the garden for this year, but the amount stored last fall, and the amount consumed this summer. To this latter may be added the amount stored this fall, and there will be found to be the total described before in the Horticultural Department.

Table F. shows the disposition to be made of the income expected to be derived from the produce at present lying unthreshed in the barns together with the stock fattening in stables and pens. It comes under the various heads of "purchase of fattening cattle," "labour," "supply," "repairs," and "seeds." A different disposition may be made by a new Principal, but there is little doubt that the farm will pay all the charges coming under those heads of expenditure.

For further particulars reference must be made to the detailed accounts of the farm. The greatest difficulty in adjusting those accounts is in fixing the amount to be paid for students' labour and sinking fund requisite to cover capital outlay. Another year's experience will enable us however to firmly establish a basis on which to settle those matters, and all others included under the terms—"farm income and expenditure."

IV. Results and Recommendations.

In order that the results of the year's operations may be fairly judged, it will be necessary to recall the objects for which the Institution was established, and the manner in which it was to be used in order to accomplish those ends. Those objects were:—

(1) Teaching.
(2) Experimenting.

And the manner in which they were to be accomplished was threefold:—

(1) An Experimental Farm was to be made.
(2) A Model Farm was to be made.
(3) A School was to be organized.

Let us look more closely at what the latter means. In the first place, then, a part of the farm must be cleaned—freed from weeds and stones—the relative qualities of the soil

noted by analysis and experiment—divided into plots, and made ready for experiments. In the second place, the remainder of the farm has to be improved. Natural pasture has to be changed into cultivated land, stumps and small swamps eradicated, and a very large amount of draining done. The land has to be cleared of thistles, weeds and stones. Fields have to be laid out and enclosed. In each of those fields the basis of a certain rotation has to be established. The barns, yards and stables have to be put in order, and the place properly stocked; a lawn, gardens and orchards have to be laid out or planted, and proper approaches made to the building; and lastly, a school has to be organized, the subjects to be taught, with their mode of arrangement and distribution laid down, and the staff requisite for the purposes of instruction determined upon.

How far, then, has this been accomplished? In the first place, a part of the farm is being cleaned and put in order as an Experimental Farm. A small portion is now ready, its condition and qualities ascertained, and it will be divided into experimental plots next spring.

In the second place, there has been a beginning—and no small beginning—made this summer in bringing the place into shape as a "Model Farm." Main drains to carry off the superfluous water of nine-tenths of the farm have been laid. 47 acres lying on the two sides of the Dundas road have been underdrained—25 of them, beside our regular summer fallow, have been summer fallowed. As many acres have been cleaned and stoned. 68 acres have been broken out of sod, and some 80 acres seeded down as the commencement of rotation; the 20 acres in front of the buildings have been laid out in lawn and garden, and so divided and enclosed that the general plan can at a glance be comprehended. Trees have been planted around and within the lawn, and others have been transplanted or removed. Carriage drives, as approaches to the College, have been constructed, and the roadway through the farm graded and enclosed for a considerable distance. 200 rods of a picket, 70 rods of a wire, and 135 rods of a straight board fence have been built. If as much be performed during each of the five succeeding years, the place will begin to deserve the proud title of a "Model Farm."

And finally, one of the wings of a main structure, 240 feet long, of which the present College will be the centre, has been erected in the shape of a Veterinary School building, whilst the present College has been improved and its accommodation increased by an additional mansard story. And, what is of greater importance, the class-room work has been thoroughly organized, and the subjects to be taught determined; their arrangement and distribution crystallized into a curriculum, and those subjects for the last ten months consecutively and successfully taught.

And now it may be asked, from the experience of the past year, what would you suggest for present action? From that experience I would make the following recommendations regarding the School, of which alone it is allowable for me to speak, as another gentleman is in charge of the Farm.

In the first place, as, through the liberality of the Agricultural and Arts Association, we will have a building to be used solely for School purposes, I would suggest that provision be made this year for furnishing a suitable laboratory, not merely to be used for lecturing purposes, but mainly to serve as the home of a practical chemist. In the second place, I would suggest that a prospectus should be immediately issued, containing not merely the information to be found in our present circular, but likewise a resumé of the practical instruction to be given in the outside department, together with a synopsis of the lectures to be delivered during each session of the two years in each department of field and class-room instruction. In the third place, I would recommend that for the present the following constitute the staff:—

A PRESIDENT, (LECTURER *in some Department;*) *and* BURSAR.
A PROFESSOR OF AGRICULTURE *and* FARM MANAGER.
A PRACTICAL CHEMIST, *and* LECTURER *on* CHEMISTRY.
A VETERINARY SURGEON, *and* LECTURER *on Veterinary Subjects.*

Beginning at the last, it is admitted on all hands that a Veterinary Department is indispensable in such an Institution as this, and it is as economical and far more satisfactory to obtain the permanent services of a single individual than to pay an intermittent lecturer.

Again, if experiments are to be tried, and the country as well as the objects for which the Institution was called into being demand that they should—a practical chemist will be next year as great a necessity as a Lecturer on Chemistry invariably is. But no man will turn his attention to the application of Chemistry to Agriculture unless his appointment be made a permanent one.

And I recommend the first two appointments to be made, instead of those of a Principal and Rector, for the following reasons: In the first place, it is extremely difficult to obtain the services of a man who unites in himself the qualifications required in the Principal of School and Farm, and utterly impossible to obtain them at the salary offered. In the second place, even if the salary were offered and the man obtained, he would be physically unable to overtake the work required of the "Principal."

I would therefore suggest that the example of the Royal Agricultural College at Cirencester, England, and the United States Agricultural Colleges, in this particular be followed, and one man appointed to take charge of the Farm, together with the practical instruction of the pupils thereon, and to deliver lectures on Practical Agriculture; whilst another should be appointed to act as Principal of the School, and Lecturer in some department—say Natural History. For some time to come he might act as Bursar, and with assistance from the rest perform the duties of Rector. The latter term is misleading, and impugns the non-sectarian character of the Institution in the minds even of those who cannot strictly be called ignorant. But whatever the titles, the fact remains undisputed and indisputable, that in Canada—or indeed the world—the attainments of the practical farmer and the experienced educationalist are seldom or ever found united in a single individual.

And now, in the last place, it may be asked, in view of the past year's experience, what ought to be done with regard to organization for the future? I answer, unhesitatingly, that we are on the right path. We are leaving out the section on the "Staff of Officials," and working up to the ideal sketched clearly by the Provincial Farm Commission. There are various questions to be settled. It is true they are questions of detail, but on the manner of their settlement depends the success or failure of the Institution. Allow me to enumerate some of them. There is the relation of the students' labour to the Model and Experimental Farms, the possibility of perfecting thorough practical instruction, the best mode of imparting that instruction, the relation of the theoretical to the practical, the relation of apprenticeship to study, the financial relation of the School to the Farm. There is the question of the number of outside instructors necessary, the number of inside lecturers requisite—the question of the establishment of a staff. There is the question of the relation of Agriculture to Horticulture; the relation of the various departments to each other and the whole. Many other questions there are, but they will all require careful attention and practical solution, and it will be well on to the end of the five years of the preparatory term ere the majority of them can be solved. What we want is those five years to lay a foundation. We are different from the other public institutions. Other institutions are finished at once; this is to be completed on a progressive system. The capital outlay in their case is immediate; in ours, gradual. The results in their case can at once be seen; in ours, years must elapse. Even financially, however, at the end of the preparatory term we will be in advance of them. Then the country will have to pay but the salaries of the staff and part of the costs of experiments; in their case, the usual annual outlay will be continued.

What we want, then is forbearance and assistance for the preparatory term of five years. We have, during that period, practically to settle a great number of questions; and in settling them mistakes will be made. What we ask for, then, is forbearance. We have to bring a place into shape for instructing, perhaps, ten generations. What we ask for is assistance from this. From its very nature, the Institution cannot be immediately popular. It is a case of statesmen discerning a want and striving to supply it, rather than of the people feeling a want and demanding it. It is a case of Governmental action preceding popular agitation. But if the place be rightly conducted, keeping its ultimate objects in view, all will be right. The personal interests of the second class, of whom I have spoken in the introduction, centre in the success of the second object of the Institution's existence; the personal interests of the first class centre in indifference. The intelligence of the second will soon commend the Institution to their favourable judgment, and the first class, as they have

done from time immemorial, will follow the bell-wethers. But whatever the opinion of the people at large, we look for the action of statesmen from their rulers. The reasons for the establishment of the Institution are wise reasons; the ends it is intended to serve are for the national benefit, and it is progressing favourably towards the accomplishment of those ends. On these grounds we ask for support.

I have the honour to be, Sir,
Your obedient servant,

WILLIAM JOHNSTON,
Acting Principal.

APPENDIX (A.)

EXAMINATION PAPERS—CHRISTMAS, 1874.

Scientific Agriculture.

Examiner : W. Johnson, B. A.

1. From what and by what agencies was the soil on the surface of the earth formed? Describe the action of the atmosphere and of water in its formation.

2. Morton says, "The soil partakes of the nature of the rock on which it rests." Discuss the truth of this statement.

3. Name the principal chemical constituents of soils and give their chemical classification.

4. Give the commoner classification of soils and the physical characteristics of each class.

5. Enumerate the mechanical processes of improving the soil. In ploughing, *e. g.*, show the benefits the penetration of air confers upon the soil.

6. It is said that "Subsoil ploughing brings to the surface injurious soil and the larvæ of insects." Answer this objection, and give the advantages of subsoil ploughing.

7. What is meant by "thorough" draining? Show particularly all the different ways in which the soil is improved by a system of underdraining.

8. Define the term "manures" and show the necessity for their use. Enumerate the principal proximate elements of plants, and describe the process by which manures replenish these—especially the non-azotized.

Practical Agriculture.

Farm Department.

1. Describe the various processes you would pursue in bringing under cultivation a Cedar Swamp.

2. What should be the condition of the land for, and what the evidence of, good ploughing :

(1) In a Sandy Loam,
(2) In a Clay Soil,
(3) In a Clay Loam

3. Give your method of preparing a stubble field—clean and regularly rotated; sowing and harvesting thereon :

(1) A crop of Spring Wheat.
(2) A crop of Barley.

4. What, if any, are the advantages of Fall Ploughing and Summer Fallowing? Discuss the matter.

5. Give a six years' rotation of crops:

(1) On a sod field, clean.
(2) On the same field, full of Canada thistles.

6. For sowing turnips, give your method of preparation and treating with manures a stubble field—sandy loam—cropped for three successive years.

7. Give a list of necessary farm implements; and describe the parts of a plough and reaping machine.

Live Stock Department.

1. Give the different breeds of cattle in general use in Canada, the leading characteristics of each breed, and compare them:

(1) As to dairy purposes.
(2) As to beef,
(3) As to both combined.

2. Give the different breeds of sheep in general use in Canada, the leading characteristics of each breed; and compare them:

(1) As to wool.
(2) As to mutton.
(3) As to both combined.

3. In the same way name the various breeds of hogs, and give the marks of a pure Berkshire pig.

4. In purchasing cattle what are the points you would look to:

(1) In a good feeder?
(2) In a good milker?

5. What points do you consider essential:

(1) In a draught horse?
(2) In a roadster?

6. Write brief notes on the following: "Grade," "thorough-bred," "hurdling or folding," "pulping," "stall feeding," "storing" cattle, "Barn-yard manures — storing, mixing and saving."

Horticultural Department.

1. Give a proper rotation of garden crops.
2. With regard

(1) To the Onion.
(2) To the Carrot.
(3) To the Beet.
(4) To the Potato.

Give

(1) A description (botanical) of the plant.
(2) Proper soil and best fertilizers.
(3) Method of Cultivation and Propagation.
(4) Name of commoner varieties.

3. Write brief notes on "Trenching," "Pruning," "Grafting," "Budding," "Transplanting," "Forcing."

4. Lay out an acre, two roods square, in garden plots, showing the vegetables grown in each.

5. Describe the preparation of hot-beds.

Botany.

1. Distinguish the Vegetable kingdom, on the one hand, from the Mineral ; and on the other, from the Animal.

2. Give the composition of a typical cell, and describe the various kinds of cells.

3. Describe the process of cell growth by free formation, by budding and by division.

4. Cellular and Vascular tissue, how distinguished ? Describe the different kinds of vascular tissue.

5. Distinguish between the structure of the root and the stem, describing both.

6. Give the distinguishing characteristics of the Acrogenous, the Endogenous, and the Exogenous stem. Describe the various parts of the latter, and distinguish clearly between the Medullary sheath and the Medullary rays

7. Epidermal Appendages, Abnormal roots, Abnormal stems. Enumerate these, and distinguish between hairs and tendrils, thorns and prickles, suckers and runners.

8. Describe the growth and structure of a bud. Characterize the different varieties of buds.

9. Describe the structure and parts of a leaf, and give the characters of the two main divisions of the simple leaf, and the classes of the same based on the shape of the margin.

10. Inflorescence. Define the term. Characterize the two divisions, and describe the various forms of indefinite inflorescence.

11. Describe the parts of a flower, and give the meaning of the terms "regular," "symmetrical," "complete," "distinct," as applied to the flower.

12. Write brief notes on the following :—"Protoplasm," "exosmose" and "endosmose," "cyclosis," "organs of nutrition and organs of reproduction," "annual, biennial and perennial plants," "radicle," "peduncle," pedicle," "stomata," "venation," "vernation," "bract," "cyme," "chorosis."

APPENDIX (B.)

CIRCULAR OF THE ONTARIO SCHOOL OF AGRICULTURE FOR THE SCHOLASTIC YEAR 1875.

HONORARY COUNCIL.—Hon. David Christie, Hon. George Brown, Hon. Archibald McKellar, Professor Buckland, James Young, Esq., M.P., Delos W. Beadle, Esq., James Laidlaw, Esq.

STAFF.

*(a) CHARLES ROBERTS, Esq., *Principal, Professor of Agriculture*
(b) WILLIAM JOHNSTON, B.A., *Rector, Interim Lecturer on Natural Sciences except Chemistry.*
(c) GEORGE BAPTIE, M.A., M.B., *Interim Lecturer on Chemistry.*
*(d) E. A. A. GRANGE, V.S., *Interim Lecturer on Veterinary Surgery and Practice.*
*(e) REV. ROBERT BURNET, *Interim Lecturer on Horticulture.*
JAMES STIRTON, *Instructor in Live Stock Department.*
JAMES MCNAIR, *Instructor in Field Department.*
JOHN F. BARRON, *Instructor in Horticultural Department.*
JAMES MACKINTOSH, *Instructor in Mechanical Department.*

CONTENTS.

INTRODUCTION.

The Institution known as "The Ontario School of Agriculture and Experimental Farm," is situated about a mile to the south of the Town of Guelph. The Farm consists

(a) Gold Medallist of Royal Agricultural College, England.
(b) Gold Medallist of the University of Toronto.
(c) Medallist of the University of Toronto, and formerly Professor of Chemistry in Victoria College Medical School.
(d) Lecturer on Anatomy in the Ontario Veterinary College.
(e) President of the "Ontario Fruit Growers' Association."
(*) For Fall and Winter at least.

of 550 acres, about 400 of which are cleared, and is composed of almost every variety of soil. It is in the centre of an extensive agricultural district—one unrivalled in the Province for the raising of stock. Readily accessible by rail from all parts of the Province, in close proximity to a town at once one of the finest grain and stock markets in Ontario —noted besides for the strong moral and religious tendencies of its people, no site could have been found more eminently uited for the establishment thereon of such an Institution.

Immediately upon obtaining possession, the Government appointed a Commission to inquire and report regarding the manner of adapting "the said farm and management and control thereof, to the purposes of a model and experimental farm." A few extracts from the Report of this Provincial Farm Commission will show clearly the basis upon which the Institution is at present established.

"The name of the Institution should be 'The Ontario School of Agriculture and Experimental Farm.'"

"The objects of the Institution should be:—*First*, to give a thorough mastery of the practice and theory of husbandry to young men of the Province engaged in Agricultural and Horticultural pursuits, or intending to engage in such; and, *Second*, to conduct experiments tending to the solution of questions of material interest to the Agriculturists of the Province, and publish the results from time to time.

"That the Farm should be separated into five distinct departments, namely:—

"(1) The Field Department.
"(2) The Horticultural Department.
"(3) The Live Stock Department.
"(4) The Poultry, Bird and Bee Department.
"(5) The Mechanical Department.

"All permanent improvements on the Farm should be carried out on a gradually developed system, and in such a manner as to exhibit and test the comparative values of the most approved method of executing the several works, and to test the cost, convenience and durability of the several appliances from time to time recommended for adoption on the farms of the Province.

"That for some time to come the work of the Farm must be mainly confined to the preparation of the fields and buildings for the systematic instruction of the pupils; that the knowledge that might be acquired from these preparatory operations would be most valuable to the pupils; that the labour of the pupils ought, therefore, to be employed as far as practicable in those preparatory operations; and that it is expedient to provide at present merely for the conduct of the Institution during this preparatory term, and utilize the practical experience obtained from it in settling hereafter the permanent organization and educational curriculum.

"That during the said Preparatory Term the chief aim should be to teach the pupils how to perform farm work in the best and most profitable manner—coupled with such an amount of scientific knowledge as will enable them clearly to comprehend the results sought to be obtained from each operation and the scientific facts and principles upon which it is based."

In order to carry out the suggestions of the Provincial Farm Commission, the Government made such improvements on the residence found on the place as would best utilize it for present purposes. Accommodation was provided for about thirty pupils, a Principal and a Rector were appointed, and a foreman for each of the following four departments engaged, viz.:

1. Farm Department.
2. Live Stock Department.
3. Horticultural Department.
4. Mechanical Department.

The Institution was opened in May, 1874, and the experience gained during the last six months has enabled the following course of study, rules, and regulations, to be temporarily drawn up. Although temporary—in force but for the "preparatory term"—they are published in order that the people—and especially the Agriculturists—of the Province

may see at a glance the terms of admission to, the subjects taught in, and the benefits to be conferred on its pupils by "The Ontario School of Agriculture and Experimental Farm."

I. TERMS OF ADMISSION.

Before admission to the School as a pupil, each candidate, being at the full age of fifteen years, will produce the following certificates :

(1) As to moral conduct.
(2) As to physical health and strength.
(3) As to the assent of his parents or guardians for admission.
(4) As to his intention to follow agriculture as an occupation.

The standard of education necessary for admission as a pupil will be as follows :

(1) Reading, Writing, Spelling.
(2) English Grammar and Composition--analysis and parsing of an ordinary English author ; familiar and business correspondence.
(3) Arithmetic—through Simple Interest.
(4) Outlines of General English and Canadian History.
(5) Outlines of General Geography and Geography of Canada.

Those who can produce certificates of entrance into any High School, those who hold Teachers' certificates, or are graduates or undergraduates of any University in Her Majesty's dominions, are considered to possess the literary qualifications requisite for admission.

II. COURSE OF STUDY.

First Year. — Practical Agriculture.
Practical Horticulture.
Botany—Structural and Physiological, and Zoology.
Elements of Geology and Physical Geography.
Chemical Physics and Inorganic Chemistry.
Animal Anatomy and Physiology, with
Veterinary Surgery and Practice.
Mensuration, Bookkeeping and English Literature.

Second Year.—Agriculture.
Horticulture.
Agricultural Chemistry.
Economic and Field Botany.
Zoology, Entomology and Meteorology.
Animal Anatomy and Physiology, with
Veterinary Surgery and Practice.
Mechanics, Land Surveying and English Literature.

The regular course is one of two years, but a single year's course may be taken by those who can produce evidence of having assisted in farm operations for at least two summers.

The term of engagement is for one year.

III.—DEPARTMENTS OF INSTRUCTION.

1. Agriculture.
2. Horticulture.
3. Chemistry.
4. Natural Sciences except Chemistry.
5. Animal Anatomy and Physiology, with Veterinary Surgery and Practice.
6. English and Mathematics.

IV.—COURSE OF APPRENTICESHIP.

The pupils will be daily distributed alternately to each of the following four Departments :—

1. The Live Stock Department.
2. The Field Department.
3. The Horticultural Department.
4. The Mechanical Department.

They will be taught the manner of performing the various operations in each Department by the Instructor or his assistants in that Department; and being distributed alternately to each, it is expected that at the end of two years a thorough apprenticeship will have been served. The instruction received in the class-room will, as far as possible, be illustrated and exemplified in the fields, yards and shops.

V.—Hours of Labour and Study; Fees; Remuneration.

The relative number of hours of labour and study will vary with the seasons, but the arrangement will be such that an annual daily average of five hours of each will be obtained and enforced.

For work faithfully and zealously performed, payment for the whole year at the rate of ten cents per hour will be made—for all other work in proportion. For tuition, board and washing, a cost rate of two dollars per week will be charged.

By faithful work, therefore, a student can receive tuition, board and washing, and leave to his credit at the end of the year a balance of fifty dollars. This amount, or such other sum as the student may have earned, will be paid to him at the end of the scholastic year, on his passing satisfactorily the terminal and sessional examinations.

VI.—Sessions and Examinations.

There will be two sessions in each year, a winter and a summer one. The former will commence on or about the first of October, the latter about the middle of April.

There will be a vacation at the end of each session.

Examinations, which every student is required to pass, will be held at the close of the session. In each inside Department, on the subject of Lectures in that Department for that session; and in each outside Department, on the work of that Department for the session.

A. General Rules.

I.—*Students are required :—*

1. To render cheerful and willing obedience to orders.
2. To conduct themselves in a gentlemanly and orderly manner at all times.
3. To avoid all noisy or boisterous conduct in or about the building.
4. To observe neatness in dress at prayers, meals, and lectures, and tidiness in their rooms.
5. To observe all general and minor regulations.

II.—*The following Practices are Absolutely Forbidden :—*

1. Profane swearing, improper language, and gambling.
2. Use of intoxicating liquors and firearms.
3. Use of tobacco while on detail, in or about the building, barns or outbuildings, or in any place except in the smoking room.
4. Entering the domestic or sleeping apartments without permission.
5. Absence without leave.

B. General Regulations.

1. All students shall reside in the building, where they are under the immediate charge of the Rector.

2. Each student upon entrance shall sign a declaration that he will conform to the rules and regulations relative to students.

3. A register shall be kept of the attendance of students at prayers, work, and lectures.

4. All students shall attend the morning and evening prayers unless exempted from so doing in consequence of the objection of their parents or guardians.

5. They shall regularly attend their respective places of worship on Sabbath.

6. No student shall be absent from the Institution after the time of evening prayers, except by permission of the Rector.

7. The Rector is authorized to impose fines and other penalties for the infraction of rules and regulations.

8. The morning bell shall be rung at 5:30 a.m.; bell for morning prayers at 6 a.m.; breakfast at 6:30 a.m.; farm bell at 7 a.m.; school bell at 9 a.m.; farm bell at 12 noon; dinner at 12:30 p.m.; farm and school bells at 1:30 p.m.; farm and school bells at 4:30 p.m.; tea at 5 p.m.; school bell at 7:30 p.m.; bell for evening prayers at 9 p.m.; lights out and doors closed at 9:30 p.m.

9. No student whose work does not at least pay for his tuition, board and washing, or who fails to pass the requisite examinations, will be allowed to remain at the Institution.

APPENDIX (C.)

EXAMINATION PAPERS—EASTER, 1875.

ONTARIO SCHOOL OF AGRICULTURE.

AGRICULTURE.

Examiner: PROFESSOR BUCKLAND.

1. From what, and by what, agencies was soil formed?
2. Enumerate the principal chemical constituents of the soil, and give a classification of soils founded upon their physical characters.
3. State the principles and effects of draining—*depth*, *inclination*, *distance* and *material* of drains.
4. What is a manure? Name the most important articles used as such.
5. State the properties and use of lime—*carbonate*, *sulphate* and *phosphate*.
6. Farm-yard manure: give its composition and properties; how to manage and preserve it.
7. What is meant by "In-and-in breeding?" Give its *advantages*, *dangers* and *drawbacks*.
8. The same of "Cross-breeding."
9. What is meant by "Ancestral Influence?" Give illustrations.
10. Which produces the greatest influence on offspring, the sire or the dam? Give illustrations.
11. What is the readiest and most practicable system of improving live stock adapted to the wants and means of Canadian farmers generally?
12. What are the weak points of Canadian farming, and how are they to be corrected?

HORTICULTURE.

Examiner: REV. ROBERT BURNET.

1. Distinguish between horticulture as science and as an art.
2. What are the benefits to be derived from Horticultural Exhibitions?
3. Give some account of the sources of the soil.
4. Write out a synopsis of the three modes mentioned in preparing the soil.
5. Enumerate a few of the manures treated of in the third lecture, and the method of preparation, if prepared.
6. What are the uses of absorbents in the preparation of manures, and name the best absorbents?
7. Give the different modes of securing new varieties of fruits.
8. Describe the process of hybridization, and give the parts of the flower operated on?
9. What are the best methods of gathering and preserving fruit?

10. State the leading advantages of fruit culture.
11. Give the benefits of planting trees for shelter, and the best varieties to plant.
12. What subjects treated of in these lectures are common to the horticulturist and the farmer?
13. Write brief notes on the following:—"Forcing," "pruning," "grafting," "budding," "hot-beds."

Chemistry.

Examiner, George Baptie, M.A., M.B.

1. What is Heat? Outline experiments to prove your statement.
2. Describe the manufacture of an ordinary Thermometer.
3. Explain the terms—Conduction, Convention, and Radiation, and give an example of each.
4. Latent heat, what is it?
5. What is meant by Chemical Action? Illustrate.
6. Mention the modes of Chemical combination, with examples.
7. Write a chapter on the atmosphere and its composition.
8. Describe at length the preparation and properties of each element, free or combined, present in the atmosphere.
9. Show the relation of anything you have mentioned in 7 and 8 to agriculture.
10. State what you know of water.
11. State leading facts with regard to preparation and properties of

Sulphuric Acid.
Phosphorus.
Ammonia.
Nitre.

12. Practical application of your knowledge of the same to agriculture.

Structural Botany.

Examiner: W. Johnson, B.A.

1. Define Botany, and show in what relation it stands—on the one hand to Biology, and on the other to Zoology.
2. Give the composition of a typical cell, and describe the various kinds of cell-growth.
3. Distinguish between cells and vessels, and describe the structure of the spiral and lactiferous vessels.
4. Describe the structure of the root, distinguishing it from that of the stem, and define the terms—"annual," "biennial," and "perennial," as applied to roots.
5. Give the different varieties of stems, and describe the structure and parts of the exogenous stem?
6. Describe the growth and structure of a bud, and give the structure and parts of a leaf.
7. Name the parts of a flower, and give the structure of the reproductive organs, describing generally the mode of reproduction in plants.
8. Give the composition of the seed, and describe the manner in which the plant springs therefrom.
9. Give a list of the Simple Fruits, and describe the Legum, Acheæ, Caryopsis, Pome and Cone.
10. Write brief notes on the following:—"Cyclosis," "organs of nutrition and organs of reproduction," "epidermal appendages," "parasite," "adventitious," buds, "suckers," "tendrils," "root-stock," "venation," "vernation," "petiole," "stipules," "inflorescence," "bract," "raceme," "cyme," "complete," and "regular," flower, "dehiscent," and "compound" fruit.

Physiological Botany.

Examiner :—W. Johnston, B.A.

1. Name the principal organic and inorganic constituents of plants, giving a list of the azotized and non-azotized organic elements ; and state as nearly as you can the part of the plant in which such constituent is found.
2. Give concisely the physiology of the root.
3. Describe the mode of growth of an exogenous stem.
4. Describe the process of absorption and exhalation by leaves, and give the causes of *coloration* and *defoliation* of leaves.
5. Describe fully the circulation of the sap, giving the various physical, chemical, and vital causes operating in its movement.
6. State briefly the chemical changes that take place in calyx, corolla, stamens and pistils, at the period of flowering ; and describe fully the process of fertilization.
7. Darwin says that "the great majority of the so-called species of plants are the result of a process of hybridization." Discuss the truth of this statement. Define "hybrid," "sub-hybrid," and "perfect hybrid." Describe the process of hybridization, and give its practical uses in Horticulture.
8. Give the commoner causes of diseases in plants, and a classification of plant diseases.
9. Give the physiological effects resulting from the action of fungi, poisons, parasites, and insects on plants.
10. Give the causes, and a description of the diseases known as—smut, rust, mildew, ergot, dry rot, potato disease, galls, and ear-cockle.

Zoology.

Examiner, W. Johnston, B.A.

1. Define Natural History, Biology, and Zoology, and show their relation to each other.
2. Life—What are its conditions? What its characteristics? By what is *living* distinguished from *dead* matter?
3. Give the six sub-kingdoms into which Zoology is divided, and the leading characteristics of the first four.
4. Give the structure and functions of an Amœba.
5. Distinguish the "test" of the Foraminifera from that of a "Sea-Urchin"—describing the latter fully.
6. Give the external and internal structure of the "hidden-eyed" *Medusæ*, and show in what way they illustrate reproduction by "alternation of generations."
7. Describe the structure of a Sea-Anemone.
8. Give the process of growth and reproduction of a tape-worm.
9. Give the two main divisions of the Annulosa, and distinguish between the crustacea and the insecta.
10. Describe the external structure of the *Lobster*, the *Spider*, and the *Butterfly*.
11. Give the main divisions of insecta, and describe the external and internal structure of the typical insect.

Physiology.

Examiner, George Baptie, M.A., M.B.

1. Define Physiology,
2. What are the results of active life in an animal? How may this be proved experimentally?
3. What is the plan of the body as shown by a transverse section?

4. What is Mucous Membrane, and where is it found?
5. Describe fully the process of digestion.
6. State the results of any experiments remembered, going to show the necessity of a mixed diet.
7. Write brief notes on the blood.
8. State what is the object and describe the circulation of the blood.
9. What are your reasons for believing in the circulation of the blood?
10. Animal Heat—How is it maintained?
11. Enumerate the organs of excretion, and explain as far as you can their *modus operandi* respectively.
12. What is the function of the sympathetic system of nerves? How has this view been supported by actual experiment?
13. What is the appearance of a transverse section of the spinal cord? What is the result of section (a) of the right half of spinal cord, (b) of the anterior root of a spinal nerve, (c) of posterior root of a spinal nerve, (d) of both anterior and posterior roots of a spinal nerve?

Veterinary Surgery and Practice.

Examiner, E. A. A. Grange, V.S.

1. Name the regions into which the vertebral column is divided.
2. How many dorsal vertebræ has the horse?
3. Mention the bones of the fore extremity.
4. Mention the bones of the hind extremity.
5. Mention the structures entering into the formation of a joint.
6. What constitutes the alimentary canal?
7. What are the preparatory organs of digestion?
8. Mention the various structures entering into the formation of the foot.
9. Mention the organs of respiration.
10. Mention the organs of circulation.

Short-horn History.

Examiner, W. Johnston, B.A.

1. Give the characteristics of the various breeds of cattle in use in Canada, and show to what end and in what manner the Improved Short-horns are their superiors.
2. State, with reasons, your opinion as to the origin of the Short-horn breed of cattle, and give a reason for making the year 1780 an epoch in Short-horn history.
3. What were the characteristics of the Teeswater cattle. Name a few of the noted breeders and noted bulls prior to the year 1780.
4. Give a short biographical sketch of the Brothers Collings, and state your reasons for considering them the originators of the Improved breed.
5. Trace the history and pedigree of Hubback, and explain what is meant by the "Kyloe controversy."
6. Illustrate by examples the system of "in-and-in breeding," as pursued by Charles Collings. Give the origin of the Duchess tribe, and name some of the families originated by Robert Collings.
7. By what means did the Short-horns gain immediate notoriety, and show the results by quotations from the Collings' sales, naming a few of the purchases, purchasers, and prices.
8. Give a summary sketch of the breeding of Mr. Thomas Bates, showing the families he favoured most, and the peculiarities following as results of the Bates' blood.
9. Give a short biographical sketch of the Booths. State their principles of selection and pairing, and define the term "Booth standard."
10. Give the names of some of the Short-horn breeders contemporaneous with Col-

lings, Bates, and the Booths ; and enumerate as many as you can of the famous breeders of established Short-horn blood in Great Britain at the present time.

11. Give a concise chronological sketch of Short-horn importations into Canada ; and name our most famous breeders.

12. Show how the E. H. B. originated, and distinguish between the Coates and the Strafford Herd Book. Give the number of vols. of the E. Am and Can. Herd Books, dating the issues of the latter ; and state any difference in principle of admission, and in the manner of recording the numbers in the three.

13. Distinguish between a "pure" and a "perfect" Short-horn ; and give the points of the latter as respects—

(a) Muzzle, (b) Crops,
(c) Brisket, (d) Spine,
(e) Hips, (f) Twist,
(g) Touch, (h) Skin and Tail.

Book-keeping and Mensuration.

Examiner, William Johnston, B.A.

I. Enter in the day-book, journalize and post the following memoranda :—

1. April 10th, 1874 :—Sold to Samuel Long 47 lbs. butter at 21c, per lb., and 63 doz. eggs at 19½c. per doz. Bought from him seed grain of following description and amounts:—

Clover seed	375 lbs.	at $6 25	per	bushel.
Timothy seed	585 "	at $3 25	"	"
Peas	2,212 "	at 85	"	"
Oats	1,765 "	at 48	"	"
Barley	2,357 "	at $1 05	"	"

2. April 20th, 1874 :—Paid to James Smith the balance of my note for two cows, drawn on October 20th, 1872, for $550 dollars, payable in two years, interest at rate of 7 per cent. per annum. Following sums paid on it :—Sept. 15th, 1873, $200 ; Jan. 1st, 1874, $150 ; discount, 6 per cent.

3. April 25th, 1874 :—Sowed on F. No. 4, 42½ bushels barley, worth $1 07 per bushel, with seed drill and broadcast sower : two teams harrowing.

4. May 1st, 1874 :—Bought and paid for yard-wide Axminster carpet, at $1 75 per yard ; and wall paper at 75c. per roll of 8 yards, for parlour 20 x 24 x 11—in it 3 windows, 5 x 8, with casings.

5. May 3rd, 1874 :—Bought from a friend and paid in advance for tile to drain F. No. 6, field square, 40 rods a side ; two main drains direct through a whole length, 4 inch pipe in one, 3 inch in other ; side drains 2 inch tile, at right angles to these, and 32 feet apart—usual prices.

6. May 10th, 1875 :—Sent two teams to R. Williams' mill for lumber ; one took down two ash logs—No. 1, 32 feet long, 15 and 12½ inches in diameter ; No. 2, 26 feet long, 13½ and 9 inches in diameter, at $18 per thousand. Brought following :—

2 pieces sq. timber—
No. 1, 28 feet long ; 10 x 12 ; 11 x 14
No. 2, 27 feet long ; 12 x 12 ; 10 x 10 } at $20 per thousand.

12 pieces, 4 x 4—16 feet long,
15 " 2 x 4—14 " "
8 " 2½ x 10—18 " "
425 ft. 2 inch plank, surface measure, } at $9 50 " "

APPENDIX D.

ONTARIO SCHOOL OF AGRICULTURE.

EASTER EXAMINATION CLASS LIST, 1875.

CLASSES.	Agriculture.	Horticulture.	Chemistry.	Structural Botany.	Physiological Botany.
I....	1. J. Palmer. 2. W. W Bremner. 3. H. W. Rhind. 4. C. Wells. 5. T. Mason. 6. G. G. Ware.	1. W. W. Bremner. 2. Ware. 3. Wade. 4. Canfield. 5. T. Mason. 6. { Lund. { Palmer. 8. Ball.	1. Palmer. 1. Bremner. 3. T. Mason.	1. { J. Palmer. { T. Mason. 3. Bremner. 4. Wells. 5. Wade. 6. Gill. 7. Comport.	1. T. Mason. 2. Bremner. 3. Palmer. 4. Wells. 5. Gill. 6. Wade. 7. Canfield.
II....	1. H. S. Lund. 2. F. Canfield. 3. J. Thomson. 4. H. J. Coate. 5. C. Berry. 6. S. Dunlop. 7. H. Wade. 8. A. T. Ball.	1. Rhind. 2. Thomson. 3. Gill. 4. Mitchell. 5. Dick. 6. Wells. 7. Coate.	1. Wells. 2. Gill. 3. Lund.	1. Thomson. 2. Coate. 3. Berry. 4. Ware. 5. Rhind.	1. Ware. 2. Coate. 3. Thomson. 4. Dunlop.
III....	1. T. Gill. 2. G. Shaw. 3. H. Montgomery. 4. A. H. Shirk. 5. J. Mitchell. 6. A. Mason. 7. A. Comport. *8. C. Durrant. *9. J. Dick. *10. H. H. Eaton.	1. Shaw. 2. Durrant. 3. A. Mason. 4. Montgomery. 5. Comport. 6. Shirk. *7. Eaton.	1. Ware. 2. Durrant. 3. Thomson. 4. Wade. 5. Coate. 6. A. Mason. 7. C. Berry. 8. S. Dunlop. 9. F. Canfield. 10. A. Ball. 11. Shaw. 12. Montgomery. 13. Rhind. 14. Shirk. *15. Eaton. *16. Comport. *17. Mitchell. *18. Dick.	1. Montgomery. 2. Mitchell. 3. Eaton. 4. Lund. 5. A. Mason. *6. Durrant. *7. Comport. *8. Dick. *9. Shirk.	1. Montgomery 2. Ball. 3. Rhind. 4. Berry. 5. Mitchell 6. Durrant. 7. Lund. 8. A. Mason. 9. Shirk. *10. Dick. *11. Comport. *12. Eaton.

Easter Examination Class List—*Continued.*

Classes.	Zoology.	Animal Anatomy.	Animal Physiology.	Short Horn History.	Book-keeping and Mensuration.
I....	1. T. Mason. 2. Palmer. 3. Bremner. 4. Gill.	1. A. Mason. 2. J. Palmer. 3. Shaw. 4. Wells. 5. Lund. 6. T. Mason.	1. Bremner. 2. Palmer. 3. T. Mason. 4. Gill.	1. Ware. 2. Palmer. 3. Bremner. 4. Thomson. 5. T. Mason. 6. Lund. 7. Wells.	1. Palmer. 2. Bremner. 3. Mason, T. 4. Dunlop.
II.....	1. Wells. 2. Wade.	1. Wade. 2. Gill. 3. Durrant. 4. Bremner. 5. Dunlop. 6. Berry.	1. Dunlop. 2. Canfield. 3. Wells. 4. Wade.	1. Dunlop. 2. Gill. 3. Shaw. 4. Rhind. 5. Wade. 6. Ball	1. Canfield. 2. Ware. 3. Thomson. 4. Wells.
III....	1. Ware. 2. Canfield. 3. { Ball. / Coate. 5. Montgomery. 6. Rhind. 7. Lund. 8. Dunlop. 9. A. Mason, 10. Shaw. 11. Thomson. 12. Berry. *13. Comport. *14. Dick. *15. Shirk. *16. Eaton. *17. Durrant.	1. Dick. 2. Coate. 3. Ball. 4. Ware. 5. Comport. 6. Thomson. 7. Montgomery. 8. Rhind. 9. Canfield. *10. Shirk. *11. Mitchell. *12. Eaton.	1. Ware. 2. Lund. 3. A. Mason. 4. Ball. 5. Durrant. 6. Shaw. 7. Coate. 8. Thomson. 9. Berry. 10. Montgomery. 11. Rhind. *12. Eaton. *13. Shirk. *14. Dick. *15. Mitchell. *16. Comport.	1. Canfield. 2. Coate. 3. Berry. 4. A. Mason. 5. Montgomery. 6. Shirk. 7. Dick. 8. Durrant. 9. Comport. *10. Mitchell. *11. Eaton.	1. Montgomery. 2. Ball. 3. Coate. 4. Rhind. 5. Dick. 6. Berry. 7. Shirk. 8. Eaton. 9. A. Mason. 10. Gill. 11. Durrant. 12. Lund. 13. Shaw. 14. Wade. *15. Comport. *16. Mitchell.

One was gone; one was ill; and two were excused from examination.

The following were the prizemen in their respective subjects:—

Agriculture	J. Palmer.
Horticulture	W. W. Bremner.
Chemistry	J. Palmer.
Botany	T. Mason.
Zoology	T. Mason.
Animal Anatomy	A. Mason.
Animal Physiology	W. W. Bremner.
Short Horn History	G. G. Ware.
Bookkeeping and Mensuration	J. Palmer.

APPENDIX (E).

FINANCIAL TABLES.

TABLE A.

Showing Appropriation Expenditure of the Ontario School of Agriculture, being for ten months ending 31st October, 1875.

I. Maintenance Account.

1. *Food.*			
Meat, Fish and Fowl	$ cts.	$ cts.	$ cts.
Bread and Biscuit	718 74		
General Groceries	277 62		
	794 50		
		1,790 86	
2. *Household Expenses.*			
Fuel—Coal	495 24		
Light—Oil	55 41		
Laundry, Soap and Cleaning	75 28		
Furniture and Furnishing	62 37		
Repairs	208 37		
		896 67	
3. *Business Department:*			
Advertising, Printing, Postage, Stationery, &c		526 96	
4. *Miscellaneous.*			
Medicines and Medical Comforts	18 74		
Unenumerated	174 55		
		193 29	
Salaries and Wages		2,006 27	
			5,414 05
5. *Horticultural Department:*			
Plants and Seeds	199 40		
		199 40	
Salaries and Wages		516 68	
			716 08

6. *Farm Department :*

Seeds	$625 09		
Repairs	904 71		
Contingencies	283 32		
		1,813 12	
Salaries and Wages		2,905 14	
			4.718 26
Bonus to Pupils	1,022 00		
Salaries of Lecturers (paid)	850 00	1,872 00	
			1,872 00
			$1,2720 39

A. Estimated Expenditure for two months, ending 31st December, 1875	5,400 00
Balance in favour of School	267 61
Total amount voted for 1875	$18,388 00

II. Capital Account.

Library, Books and Apparatus	$167 31		
Implements	525 35		
Artificial Manure	157 87		
Permanent Improvements	1,340 10		
Live Stock	4,748 05		
Mansard Story	3,000 00		
		10,038 68	
Estimated Expenditure for the two months ending 31st December, 1875		1,800 00	
			11,838 68
Balance in favour of School			491 32
Total amount voted for 1875			$12,530 00

TABLE B.

Showing the Estimated Appropriation Expenditure of the Ontario School of Agriculture and Experimental Farm, for the year 1876.

I. Maintenance Account.

1. *Food:*	$ cts.	$ cts.	$ cts.
Meat, Fish and Fowl	1,600 00		
Bread and Biscuit	600 00		
General Groceries	1,600 00		
		3,800 00	
2. *Household Expenses:*			
Fuel—Coal	900 00		
Light	200 00		
Laundry, Soap and Cleaning	150 00		
Furniture and Furnishing	200 00		
Repairs	400 00		
Incidentals	200 00		
		2,050 00	
3. *Business:*			
Advertising, Printing, Postage, Stationery, &c		600 00	
4. *School:*			
Fuel, Light and Cleaning	150 00		
Stationery, Printing, &c	50 00		
		200 00	
5. *Miscellaneous:*			
Medicines and Medical Comforts	50 00		
Bonus to Pupils	900 00		
Contingencies.	600 00		
		1,550 00	
			8,200 00

A. Salaries and Wages.

Professor of Agriculture and Farm Manager	2.000 00
President and Lecturer on Science	1,500 00
Lecturer on Chemistry and Practical Chemist	1,200 00
Lecturer on Veterinary Surgery and Practitioner	600 00
Physician	200 00

	$ cts.	$ cts.
Field Foreman	600 00	
Live Stock Foreman	600 00	
Gardener	600 00	
Carpenter	600 00	
Housekeeper	300 00	
Cook	120 00	
Laundress	120 00	
Dairymaid	120 00	
Tablemaid	96 00	
Two Housemaids	180 00	
Messenger	120 00	
Engineer	360 00	
Assistant do. for five months	100 00	
		9,416 00
		$18,616 00

II. Capital Account.

Library and Apparatus	1,000 00	
Live Stock	6,000 00	
Implements	300 00	
Artificial Manure	300 00	
Permanent Improvements	3,000 00	
Experiment s	1,500 00	
Building	13,000 00	
		$25,000 00

TABLE C.

Inventory of Stock, with Prices.

I. Horses.

	$ cts.	$ cts.
14 Working Horses	2,100 00	
2 Brood Mares	400 00	
2 Foals	100 00	
		2,600 00

II. Cattle.

I. *Short Horns*

1 Two Year Old Bull	300 00	
1 Bull Calf	100 00	
3 Cows	2,500 00	
		2,900 00

2. *Grades.*

10 Cows	500 00	
7 Calves	140 00	
		640 00

III. Sheep.

1. *Cotswold.*

34 Breeding Ewes	1,190 00	
7 Ewe Lambs	175 00	
1 Shearling Ram	175 00	
4 Ram Lambs	200 00	
		1,740 00

2. *Leicesters.*

12 Breeding Ewes	240 00	
1 Ram Lamb	40 00	
		280 00

3. *Southdowns.*

8 Breeding Ewes	280 00	
2 Ewe Lambs	50 00	
1 Two Shear Ram	150 00	
		480 00

4. *Grades.*

160 Fattening Sheep	1,120 00	
16 Lambs	64 00	
		1,184 00

5. *Pigs* (*Berkshire.*)

1 Boar	50 00	
5 Sows	150 00	
		200 00
		$10,024 00

TABLE D.

INVENTORY OF IMPLEMENTS WITH PRICES.

I. FIELD DEPARTMENT.

No. of each.			
4	Waggons	$390 00	
4	Sleighs	157 00	
2	Carts	80 00	
7	Ploughs	215 00	
4	Pairs of Harrows	88 00	
1	Gang Plow	50 00	
1	Seed Drill	85 00	
1	Broad-cast Sower	85 00	
1	Reaper	135 00	
1	Mower	85 00	
2	Horse Rakes	64 00	
2	Rollers	85 00	
1	Cultivator	45 00	
1	Horse Power	120 00	
1	Separator	360 00	
1	Fanning Mill	32 00	
1	Straw Cutter	50 00	
1	Grain Crusher	50 00	
1	Democrat Waggon	125 00	
1	Folding-seat Buggy	125 00	
1	Pleasure Sleigh	65 00	
1	Folding-seat Cutter	51 00	
4	Hay-racks	50 00	
7	Sets Plough Harness	175 00	
4	Sets Team Harness	200 00	
2	Sets Cart Harness	30 00	
1	Set Buggy Harness (double)	50 00	
1	Set Buggy Harness (single)	30 00	
3	Buffalo Robes	55 00	
5	Pairs Horse Blankets	18 00	
1	Drag Saw	55 00	
1	Pair Platform Scales	51 00	
1	Turnip Drill	18 00	
1	Scuffler	80 00	
200	Bags	26 00	
	Trees	26 00	
	Tools, viz: Draining Spades and Shovels, Rakes, Pitchforks, Manure Forks, Scythes, Chains, Hoes, Axes, &c. &c.	200 00	
			519 00
			$3595 00

II. Live Stock Department.

2 Root Cutters	$80 00	
4 Dozen Cattle Chains	18 00	
2 Barrows	10 00	
4 Manure Forks	4 00	
Shovels, Rakes, Feed Buckets, Sheep Shears, &c	10 00	
		122 00

III. Horticultural Department.

400 Flower Pots	$28 00	
3 Garden Rakes	3 00	
16 Garden Spades	22 00	
12 Drain Hoes	9 00	
5 Dutch Hoes	3 25	
12 Shovels	18 00	
2 Scythes and Snaths	3 00	
1 Garden Plough	12 00	
1 Cultivator	8 00	
2 Burrows	10 00	
1 Screen	1 00	
2 Trowels	80	
5 Pruning Saws	3 75	
2 Manure Forks	2 00	
3 Potato Forks	4 50	
2 Garden Rule and Lines	3 00	
3 Tree Scrapers	90	
1 Hammer	1 00	
1 Edging Scissors	2 50	
1 Hedge Scissors	3 00	
6 Garden Pans	7 50	
1 Pruning Scissors	3 00	
1 Greenhouse Syringe	5 00	
2 Pruning Knives 3 x 6	2 00	
40 Hotbed Lights	80 00	
2 Picks	2 50	
1 Hellebore Duster	1 25	
1 Edging Knife	1 50	
1 Bill Hook	1 25	
5 Garden Dibbles	5 00	
		164 45
		$248 20

III. Mechanical Department.

	$ cts.
6 Jack Planes	6 00
5 Joiners do	7 50
6 Smooth do	5 40
2 Rabbits do	1 50
3 Boxing Braces and Bits	18 50
6 Hammers	6 00
1 Boxing Machine and Extra Bit	7 00
1 Paint Mill	6 00

1 Cross-cut Saw	$3 00	
3 Rip Saws	7 50	
4 Cross-cut Saws	8 00	
1 Set Chisels	5 00	
1 Blacksmith's Vice	7 00	
1 Adze	1 50	
3 Draw Knives	3 75	
2 Hand Axes	4 00	
2 Steel Squares	3 00	
3 Tool Brackets	3 75	
6 Bench Levers	7 50	
6 Chisels	2 00	
5 Try Squares	2 00	
1 Compass Saw	85	
1 Glue Pot	1 00	
7 Paint Brushes	3 00	
1 Grindstone	3 00	
Oil Cans, Gimlet Bits, Stone Hammer, Oil Truss, &c., &c.	20 00	
		143 75
Field Department		3,595 00
Live Stock Department		122 00
Horticultural Department		248 20
Total		$4,108 95

TABLE E.—Abstract of Farm Income and Expenditure, from 1st November, 1874, to 31st October, 1875.

INCOME.	$ cts.	$ cts.	EXPENDITURE.	$ cts.	$ cts.

TABLE E.—Abstract of Farm Income and Expenditure, from 1st November, 1874, to 31st October, 1875.

INCOME.	$ cts.	$ cts.
1. Farm Produce.		
508 bushels Barley ..... @ $1 00 per bushel	508 00	
61 29/48 do do ..... @ 0 99 do	61 00	
575 84/80 do do ..... @ 0 90 do	518 30	
380 do Peas ..... @ 0 73 do	277 40	
985 do Oats ..... @ 0 40 do	394 00	
102 do Spring Wheat @ 1 00 do	102 00	
4,120 do Turnips ..... @ 0 07 do	288 40	
210 do Potatoes ..... @ 0 40 do	84 00	
65 tons Hay ..... @ 14 00 per ton	910 00	
Straw (estimated value)	200 00	
		3,343 10
2. Stock.		
Cattle sold at Christmas	714 00	
Sheep sold in January	768 00	
Pigs sold in February	72 00	
Cattle sold at Easter	1,511 40	
Cattle sold in June	539 65	
Pigs sold in October	87 00	
		3,692 05
3. Increase of Stock.		
Estimated value	704 00	
		704 00
4. Miscellaneous.		
480 loads of Manure @ $1 25 per load	600 00	
Butter and Milk supplied to College	150 00	
Service of Stock	8 00	
		758 00
		8,497 15

EXPENDITURE.	$ cts.	$ cts.
1. Farm Produce consumed.		
985 bushels Oats, @ $0 40 per bushel	394 00	
45 tons Hay, @ $14 00 per ton	630 00	
Straw	60 00	
260 bushels Peas, @ $0 73 per bushel	189 80	
4,120 do Turnips, @ $0 07 per bushel	288 40	
Straw	140 00	
20 tons Hay, @ $14 00 per ton	280 00	
		1,982 20
2. Feed and Fodder purchased.		
For Cattle, Sheep and Pigs	982 72	
For Horses	784 65	
		1,767 37
3. Cattle purchased.		
3 Cows, Durham	1,325 00	
29 Cotswold Ewes	1,125 23	
2 Rams	210 00	
		2,660 23
4. Placed on Farm or supplied to College.		
Labour of two Ploughmen for two months	255 55	
Estimated value of increase of Stock	704 00	
480 loads of Manure, @ $1 25 per load	600 00	
210 bushels Potatoes, @ 0 40 per bushel	84 00	
28 do Wheat, @ 1 00 do	28 00	
Butter and Milk supplied to College	150 00	
		1,821 55
5. Balance on hand.		
74 bushels Spring Wheat, @ $1 00	74 00	
120 do Peas, @ $0 73	87 60	
Cash deposit in Bank	104 20	
		265 80
		8,497 15

ONTARIO SCHOOL OF AGRICUTURE, IN ACCOUNT WITH THE GARDEN.

(*From Nov. 1st, 1874, to October 31st, 1875.*)

DR.	$ cts.	$ cts.
Apples—107 bushels, at 60c	64 00	
Cabbage—1600 heads, at 5c	80 00	
Beets—12 bushels, at 50c	6 00	
Carrots—30 bushels, at 25c	7 50	
Parsnips—10 bushels, at 50c	5 00	
Radishes—4 bushels at 50c	2 00	
Turnips—4 bushels, at 20c	80	
	——	165 50

Apples—21 bushels, at 50c	10 50	
—— (Crab)—3½ bushels at $1	3 50	
Asparagus—132 bunches, at 4c	5 28	
Beans—5 bushels, at 80c	4 00	
Beets—6 bushels, at 50c	3 00	
Cabbage—92 heads, at 6c	5 52	
Cauliflower—101 heads, at 10c	10 10	
Carrots—36 bunches, at 5c	1 80	
" —3 bushels, at 40c	1 20	
Corn—4 dozen, at 10c	0 40	
Cucumbers—450	2 25	
Currants—1 peck	1 00	
Celery—18 heads, at 10c	1 80	
Lettuce—76 bunches, at 5c	3 80	
Marrow (Vegetable)—11, at 10c	1 10	
Onions—62 bunches, at 5c	3 10	
Parsnips—7 bushels, at 50c	3 50	
Parsley—18 bunches, at 5c	0 90	
Peas—17 bushels, at 50c	8 50	
Plums—2 bushels, at $2	4 00	
Potatoes—43 bushels, at 50c	21 50	
Radishes—14 bunches, at 5c	0 70	
Rhubarb—110 bunches, at 5c	5 50	
Spinach—3 bunches, at 50c	1 50	
Squash—17, at 10c	1 70	
Tomatoes, 4½ bushels, at $1	4 50	
Turnips—2 bushels, at 25c	0 50	
" 10 bunches, at 5c	0 50	
	——	111 67
For fall of 1874, per list above		165 00
		$277 17

Garden.

CR.

By Fruits and Garden Vegetables . . . $277 17

TABLE F.—Estimated Farm Income and Expenditure from 1st November, 1875, to 31st October, 1876.

INCOME.	$ cts.	$ cts.	EXPENDITURE.	$ cts.	$ cts.

TABLE F.—Estimated Farm Income and Expenditure from 1st November, 1875, to 31st October, 1876.

INCOME.	$ cts.	$ cts.
1. Farm Produce.		
2,200 bushels Barley, @ $0 60 per bushel	1,320 00	
300 do Wheat, @ 1 00 per do	300 00	
1,200 do Peas, @ 0 60 per do	720 00	
1,170 do Oats, @ 0 40 per do	468 00	
200 do Carrots, @ 0 20 per do	40 00	
400 do Mangolds, @ 0 15 per do	60 00	
1,200 do Turnips, @ 0 07 per do	840 00	
150 do Potatoes, @ 0 40 per do	60 00	
35 tons Hay, @ 16 00 per ton	560 00	
		4,368 00
2. Cattle.		
Sheep—Lot No. 1—Christmas 1875	575 00	
Sheep—Lot No. 2—Easter 1875	800 00	
Sheep—Lot No. 3—Lambs 1876	400 00	
Pair of Horses—Spring 1876	300 00	
Wool—Spring 1876	400 00	
Cattle—Easter 1876	240 00	
		2,715 00
3. Increase of Stock.		
Estimated value	1,200 00	
		1,200 00
4. Miscellaneous.		
Manure	500 00	
Milk and Butter to Institution	300 00	
Balance from 1875	265 80	
		1,065 80
		9,348 80

EXPENDITURE.	$ cts.	$ cts.
1. Farm Produce to be Consumed.		
1,200 bushels Peas, @ $0 60 per bushel	720 00	
1,170 do Oats, @ 0 40 per do	468 00	
200 do Carrots, @ 0 20 per do	40 00	
400 do Mangold, @ 0 15 per do	60 00	
12,000 do Turnips, @ 0 07 per do	840 00	
150 do Potatoes, @ 0 40 per do	60 00	
40 do Wheat, @ 1 00 per do	40 00	
35 tons Hay. @ 16 00 per ton	560 00	
		2,788 00
2. Cattle to be Purchased.		
15 Fattening Steers	600 00	
15 Fattening Pigs	150 00	
40 Fattening Sheep	180 00	
		930 00
3. Feed and Fodder to be Purchased		
40 tons Hay	700 00	
900 bushels Oats	400 00	
		1,100 00
4. Labour.		
3 Men for one year	750 00	
3 Labourers for 7 months	630 00	
		1,380 00
5. Placed on Farm or supplied to House.		
Increase of Stock	1,200 00	
Manure	500 00	
Milk and Butter	300 00	
Repairs and Seeds	1,150 80	
		3,150 80
		9,348 80

These Tables are certified to be correct.

WM. JOHNSTON, *Bursar and Acting Principal.*

VII. Report of the Physician.

Guelph, Nov. 17th, 1875.

The Honourable the Provincial Secretary:

Sir,—I have the honour as Physician to the Ontario School of Agriculture, to transmit to you, this my first Report.

The sanatory condition of the Institution is good, with the exception of six rooms in the Mansard story, not yet occupied; I would suggest that a moveable fan light be placed over each door, and thus make the ventilation what it ought to be.

The food is good and well prepared. On the whole the health of the pupils has been good.

E. W. McGuire,
Physician O.S.A.