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NEW ZEALAND.

AGRICULTURAL EDUCATION IN NEW SOUTH WALES

(REPORT ON), WITH SPECIAL REFERENCE TO THE HAWKESBURY AGRICULTURAL COLLEGE, BY MR. E. NEWMAN, M.P.

Laid on the Table by leave of the House.

SIR,— Wellington, 10th July, 1913.

I have the honour to report that, as arranged, I proceeded to New South Wales in order to inspect the Hawkesbury Agricultural College, and to gain an insight into the system of agricultural education which is followed in that State.

I arrived in Sydney on the 3rd June, and at once presented the letter of introduction with which you were good enough to provide me to the Minister of Agriculture, the Hon. J. L. Treflé, M.P., by whom I was most cordially received.

Mr. Treflé at once fell in with your suggestion that I should be afforded an opportunity of inspecting Hawkesbury and generally acquiring information with regard to agricultural education in the Department under his control, and instructed Mr. George Valder, Under-Secretary for Agriculture, accordingly.

I desire here to acknowledge the courtesy and consideration extended to me as your representative on this occasion, and I especially wish to mention with appreciation the attention and interest displayed in connection with my mission by Messrs. Valder, Under-Secretary for Agriculture, and H. W. Potts, F.C.S., F.L.S., Principal of the Hawkesbury Agricultural College, and also by other officers of the Department.

The Minister very kindly supplied me with a shorthand-typist, and, in order that you might get as nearly as possible first-hand information, I had my last interviews with Messrs. Valder and Potts taken down in shorthand and typewritten. Attached hereto please find the reports of these interviews, which I trust will prove of interest to you.

I propose—

(1.) To describe the Hawkesbury Agricultural College, its objects, and its work;

(2.) To briefly refer to the general system of agricultural education in vogue in New South Wales;

(3.) To give you my impressions of the College and the New South Wales system.

In order, again, that your information may be as reliable as possible, I shall endeavour to quote from authorized documents in so far as I can do so.

PART I.—DESCRIPTION OF HAWKESBURY AGRICULTURAL COLLEGE, ITS OBJECTS, AND ITS WORK.

Proceeding on this principle I propose to quote from the "Prospectus of the Hawkesbury Agricultural College, Dairy School, and Experimental Farm, Richmond, New South Wales."

Objects of the Institution.—The primary object that the Department of Agriculture had in view in establishing this College and farm was to teach the science of agriculture and the various other sciences connected therewith, their practical application to the cultivation of the soil, the rearing and management of stock, and to qualify students as far as possible for the profitable management of farms, orchards, vineyards, &c., either as proprietors or managers of same.

To this end it was deemed indispensable that every young man who should be admitted to the College should learn to labour and become proficient in the use of the various implements of husbandry employed on the farm, and in the management of the various kinds of live-stock included in the practice of agriculture. Every student, therefore, is required to perform a certain amount of labour.

One other object in view in establishing the farm was the conducting of experiments in various branches of agriculture, but more particularly in respect to the comparative values of the various artificial and commercial fertilizers, the rotation of crops, and growth of plants suitable to the climate of New South Wales, but not generally adopted in agriculture. In a

word, to design and carry on experiments in every department of agriculture for the purpose of improving its processes and enhancing the value of its products.

Students have access to the experimental grounds and all other parts of the farm under such rules as may be drawn up by the Principal and approved by the Minister.

These may be said to be briefly the objects those had in view who established the Hawkesbury Agricultural College.

Situation, Character of Soil, Buildings, &c.—The College itself is situated about one mile from the Town of Richmond, and thirty-eight miles from Sydney. The soil is mostly of an inferior quality, but of considerable variety. So far as I could discover, the general characteristic of the soil is that of clay with clay subsoil, or sand with sandy subsoil, some of it of a very inferior quality: where the orchard is situated struck me as being apparently nothing but sand. I think it is an old river-bed. In order to get trees to grow it is necessary to supply a good deal of the soil for the roots.

In addition to what is called the College farm, they have on the banks of the Hawkesbury River, about three miles distant, another farm of 116 acres of rich alluvial soil. On this latter place there is being carried out a system of irrigation to afford opportunity for the teaching of intensive cultivation.

The College has accommodation for two hundred resident students, the main building being in the form of a quadrangle. The students' quarters are two-storied, of brick. Every student has a separate room, and the whole of the buildings are lighted by electricity.

Apart from the students' quarters there are large and commodious farm buildings, lecture-halls, class-rooms, and laboratories for practical work in chemistry, physics, photography, botany, entomology, bacteriology, and nature-study.

Experimental Plots.—About 100 acres of the College farm are set aside and laid out in small plots, where series of experiments and tests with roots, grasses, cereals, and manures are systematically conducted from year to year under the direction of an experienced agriculturist.

The Horticultural Department includes a very fine and fully-stocked orchard, vegetable-garden, a cannery, and other accessories required to give instruction in fruitgrowing, preserving, packing, and market-gardening.

The Poultry Section has several varieties of purebred fowls, ducks, geese, and turkeys, and extensive experiments (one lasted over ten years) with laying fowls are carried on in this section. Ostrich-farming is also conducted here, and I understand successfully, from a commercial point of view.

The Pig Section possesses six of the best breeds of imported pigs. The boars and sows appeared to be of very high quality, and have been selected and imported from the best strains in England and America. Bacon-curing is carried on in the establishment for the instruction of the students.

The Dairy Farm is stocked with a mixed breed of dairy cattle, and provision is made for the teaching of dairying in all its branches. The dairy is fully equipped with the most recently designed appliances for the treatment of milk and the manufacture of butter and cheese.

The Horses.—The draught horses used on the farm are Clydesdales, Shires, Suffolk Punches, and mules; and their rearing, breeding, and management form one of the chief features in the course of study.

The quality of the Clydesdale horses is unquestionable. The purebred stallion won the First and Champion in his class at the Royal Agricultural Show in England in 1912. The Clydesdale Society of Scotland selected him as a typical Clydesdale for the International Horse-show at Olympia. He cost £500. There is another stallion on the farm which cost £450, and a third £420. There are three Clydesdale mares, which cost £125 each. The students are fortunate in having such splendid models on which to form their ideas of the points of Clydesdales. These animals were all imported from Home, and must prove very valuable additions to the draught stock of the State.

Other Branches.—Connected with the farm there are the carpentry, blacksmithing, saddlery, engineering, and butchering departments, in all of which students are given a systematic course of work suitable for farm requirements.

There are also a flower-garden, nursery, and grass-garden, and students are given training in the collection of flowers, hedge-trees, and shrub-seeds. The raising and cultivating of seed and ornamental trees, hedges, shrubs, and flowers, and pruning, hedging, and other operations, are also taught.

There is a splendid library, containing about three thousand volumes, being books relating chiefly to agriculture, which is open for the use of students and the staff at all times.

In addition the College possesses a fine gymnasium, a concert-hall, recreation-grounds for football, cricket, and hockey, and four lawn-tennis courts. In the grounds there has lately been erected a splendid pavilion on stone foundations, the work of the students themselves. There are also a swimming club and a rifle range on the farm.

The Rules of Admission.—Applications are received from prospective students of fifteen years of age and upwards, but candidates are not eligible for admission until they are sixteen years old.

As boys generally leave school about fourteen years of age, the Hurlstone Agricultural High School has been erected to carry on the general education of boys, with special emphasis on science and agricultural methods, between the ages of fourteen and sixteen. It will provide a carefully arranged theoretical course of study in agriculture, and forms a link between the primary school and the Hawkesbury Agricultural College or the faculty of agriculture at the University. This school is under the Education Department.

Boys proceeding to the College from one of the State-school farms or from the Hurlstone Agricultural High School, after having been through the two-years course at one of these institutions and passing the prescribed examination, are admitted to Hawkesbury as second-year students. Otherwise applicants desiring to take the full College course or the diploma have to pass an entrance examination, which is practically the Sixth Standard in the public schools.

Students failing at these examinations or not desirous of sitting for them can stay on at the practical work of the farm and take special courses, such as the dairying, orchard, poultry, or piggery courses, as vacancies occur.

Physique and general aptitude for college work are considered in conjunction with the applicants' educational attainments. Each applicant has to produce a testimonial as to character from his last teacher or employer, evidence as to his aptitude and fitness for agricultural education, and a medical certificate as to the state of his health.

Fees (Diploma Course).—The fees are £30 the first year, £20 the second year, and £10 the third year, with a few additional small charges, such, for instance, as 11s. for medical attendance, 4s. for medicine, and 10s. to cover expenses connected with sports (football, cricket, hockey, shooting, and gymnastics) and concerts connected with the social life of the College.

Courses.—The principal work of the College is the three-years diploma course, but in addition to this there are special courses in the dairy, orchard, poultry, piggery, experimental plots and farm, carpentry, saddlery, blacksmithing, and engineering sections. There are also short courses for farmers in winter, and a summer school for public-school teachers (described later). The rural-schools course for town children is also held at Hawkesbury.

The curriculum of the diploma course is as follows: The course extends over three years. The College year is divided into two sessions of twenty weeks each, the first of which begins in January of each year and ends in June; the second in July and ends in December. The subjects dealt with are as follow:—

First year: Principles of agriculture; chemistry; practical chemistry; botany; English; arithmetic; elements of surveying.

Second year: Principles of agriculture and live-stock; chemistry; practical chemistry; elementary mechanics; entomology; sheep and wool; book-keeping; veterinary science.

Third year: Principles of agriculture and live-stock; chemistry of the soil; practical chemistry; botany; farm-engineering; veterinary science; sheep and wool.

An examination is held at the end of each year, and a pass is awarded to students obtaining 50 per cent. of the maximum marks in principles of agriculture and 50 per cent. of the total maximum marks in all other subjects, except at the end of the third year, when 70 per cent. must be obtained in practical agriculture and 50 per cent. of the total maximum marks in all other subjects; but the number of marks obtained in any one subject must not be less than 33 per cent.

Students failing to pass the examination at the end of any year may apply to the Principal for permission (1) to attend the year's course again; (2) to sit for the examination again at the end of the next year without attending at the College; or (3) to attend one or more special courses during the year. A student failing to attend 90 per cent. of the lectures delivered on any one subject is not permitted to sit for the annual examination. At the end of the first and second years certificates of competency are awarded to successful students, and the full College diploma to those passing the third year's examination. The latter are then entitled to the academic distinction of H.D.A. (Hawkesbury Diploma of Agriculture).

All these students are required to work on alternate days at outside work on the farm or in the class-rooms or laboratories, as directed. This is one of the most important features in connection with the establishment. They also visit some of the higher-class farms and other agriculturally educative institutions in groups periodically, and from these no doubt they acquire a large amount of valuable information.

Special Courses.—A large number of special courses are available for students desiring to follow any particular branch of farming. The fees and deposits for special-course students are the same as for the first year of the diploma course, but non-resident students are admitted to either the diploma or special courses at a fee of £2 2s. per annum. The special courses are as follow:—

(1.) Special dairy course of six months: This covers all the subjects connected with dairy-farming and dairy-work, and at the end of the term a practical and theoretical examination is held, and certificates are awarded to those proving competent in milk-testing, buttermaking, cheesemaking, and dairy-farming; but each student must obtain 50 per cent. before he receives his pass.

(2.) Special orchard course: This extends over a period of twelve months, and embraces all sections of orchard-work. A certificate of competency is awarded on conditions similar to those mentioned above.

(3.) Special piggery course: The instructional course here covers all phases of the management of pigs, including judging on a score-card system, killing, and dressing pigs. A certificate of competency is issued in this department also to those proving successful.

(4.) Special poultry course: This extends over a period of six months, and is intended for students who propose taking up poultry and ostrich farming.

(5.) Other special courses: There is a special course of twelve months in the experimental plots and farms branch, and also short courses in carpentry, blacksmithing, saddlery, and engineering.

This, I think, may be taken as a description of the actual work carried on by the College for the benefit of students who are in residence for the complete term, but in addition to this there is a very valuable branch known as the *Dairy School.*

The object of this section is to supply the demand from all parts of Australasia for men qualified to supervise the supply, manufacture, and marketing of dairy-produce. The course takes two years, and the whole time is devoted to the theoretical and practical study of these subjects. In other words, the course is to provide men competent to become managers of butter and cheese factories, of dairy farms, creameries, condensed-milk factories, and suitable for appointment as Government dairy inspectors, or instructors in agriculture for technical colleges, experimental farms, and agricultural high schools.

In addition the school is used for experimental work in matters relating to the breeding, rearing, and feeding of stock, and in the manufacture of dairy-produce for home use and shipment to other markets. The students must not be less than seventeen years of age.

The fees are £30 per annum, payable half-yearly, this being for the maintenance and education of each student. There are also small extra charges for medical attendance, and so on.

A limited number of non-resident students are admitted on the approval of the Minister, the fees for whom are £2 2s. per annum. The curriculum of this school for the two years is as follow:—

First year: Principles of agriculture and live-stock; elementary chemistry (theory and practice); elementary veterinary science; book-keeping; mechanics.

Second year: Dairy chemistry (theory and practice); milk- and cream-testing (theory and practice); cream-grading; buttermaking (theory and practice); elementary cheesemaking (theory and practice); veterinary science as applied to cattle and pigs; dairy engineering; factory design and management; bacteriology; factory book-management; sanitation and public-health regulations.

At the end of the year an examination is held, and students have to obtain 50 per cent. of the total maximum marks and not less than 33 per cent. in any one subject in order to secure a pass. Those proving successful at the end of the course are entitled to the academic distinction of H.D.D. (Hawkesbury Diploma of Dairying).

Students also have lectures in the yards on live-stock, when judging horses, cattle, and pigs on a system of score-cards is regularly and systematically taught. They have practical work on the farm such as the arrangement and construction of buildings, yards, and fences; instruction in the management and working of implements and machinery; cleaning, feeding, and management of live-stock; identification and selection of seeds; valuations of stock; and generally everything that is likely to aid the students to become successful dairy-farmers.

Winter School for Farmers.—Another branch of the College work which is of great interest is that described as the winter school for farmers. This is provided at the slack period of the year for busy farmers and stockowners, who can devote only a limited time to study and intensive practical instruction.

The winter-school course embraces a large variety of subjects, and students are invited to select such branches of training as may be best suited to the conditions in their own districts and farms. The course of instruction is for four weeks. Farmers and graziers, or their sons who have worked one year on the land and are of the age of sixteen years, are eligible for admission. The number is limited to one hundred. The Railway Department offers specially favourable rates for students attending the winter school. The fee is £2 2s. for the course, *including board and lodging at the College.*

Instruction is given by lectures on such subjects as lime and liming the soil; irrigation; principles of breeding of stock; the composition and characteristics of milk; crops for dairy cattle; ensilage; feeding of cattle; feeding of pigs; diseases of pigs; bacon-curing; insect pests; diseases of grain; trees and their importance to farmers; useful and destructive birds; farm book-keeping; measurement of haystacks, silos, &c.; estimating the capacity of dam-excavations; elementary surveying; use of the prismatic compass; hints on draining, levelling, &c., on the soil; rotation of farming; drainage; points on manuring, farmyard manure, commercial fertilizers; cultivation of grain crops; preservation of pastures; and many other subjects of use to practical farmers.

Further, outdoor demonstrations and field-work are carried on in the construction of implements and machinery (ploughs, harrows, rollers, seed-drills with fertilizer attachments, mowing and harvesting machines, junior hand machines, &c.), the care of farm implements and machinery, conservation of farmyard manure, cleaning and grading of seeds. Field lectures on growing crops are also available for students.

Demonstrations are also given in carpentry by the foreman carpenter. Instruction is given in the management and feeding of poultry; in the management and care of steam-engines, boilers, &c.; in the use of the electric motor in agriculture, sawing-machines; in blacksmithing work (including general repairs to agricultural implements and machinery); saddlery (how to cut up a side of leather, lining of saddles and collars, making light and heavy thread, &c., use of knives, punches, pliers, &c., in saddlery work, and repairing of all parts of harness, including blinkers, lines, collars, and saddles).

Students also have an opportunity of acquiring information by a series of yard lectures on the breeding, management, &c., of pigs, the fattening of pork and bacon, and the practical work includes the killing and dressing of pigs, the curing and smoking of bacon, castrating and ear-marking. Demonstrations are also given in hedge-cutting and trimming, propagation and planting of hedge-cuttings, budding and layering, pruning trees and shrubs, the erection of fencing-posts and wire-posts, mortising, &c. Lectures and demonstrations for those who desire instruction in veterinary science (including first aid to sick and injured farm animals), and by a bee expert on various phases of bee-keeping, are also given.

Rural Camp Schools.—The College is also made use of by the Education Department in connection with what is known as rural camp schools. These have been organized in order to bring the city boys out into the country for a short time. The boys are brought out in squads, and camp at the school. The following is a sample syllabus of one day's proceedings at a rural camp school:—

The boys assemble at the Principal's office at 8 a.m. They inspect the library, chemical laboratory, lecture-halls, &c. They then visit the orchard, garden, cannery, and vegetable-garden. At 10 o'clock they inspect the power-house and lighting-plant, implement-sheds, and steam laundry. At 11 a.m. a lecture is given them on nature-study. At 12 noon they go into the gymnasium, and also have lunch. At 1 o'clock there is a lecture in the experimental plots, and at 2 p.m. they visit the dairy, milking sheds and bails, see the milking by hand and machinery, the feeding of the calves, ensilage-pit, butter and cheese making, and milk-testing.

On other days the boys are taken round the poultry-yards, and the system of laying-competitions is explained while they are inspecting. They see the geese, turkeys, ducks, and various breeds of poultry, ostriches, and the feeding of these, &c. They are also shown the piggeries, and the difference between the various breeds of pigs is explained. They inspect the stable, and are given brief expositions on saddlery, carpentry, and blacksmithing. In the evening a lantern lecture is given in the College lecture-hall.

This is a sample of the work which is done in connection with the rural camp schools at Hawkesbury, and is an attempt by the Government of New South Wales to counteract the tendency of the young men to congregate in the towns. It is an effort to interest the boys of Sydney and other large towns in rural pursuits, and I think I may say thousands of boys are sent out from the cities for a short time in the country, and in the opinion of those who appear to be qualified to judge a large number of youths are thus attracted into country life. The Minister of Education, speaking at Hawkesbury recently, said, "Not only have we sent teachers to learn at the feet of Mr. Potts, but every one of the thousands of boys who has attended at these schools has become a missionary in dispelling the metropolitan ignorance in regard to rural life through the agencies of these rural camp schools, and the essays and discussions that result from a visit of metropolitan schoolboys to the country. We have created a certain amount of interest in the mind of the city boy in connection with the country."

Summer Schools for Public-school Teachers.—Provision is also made at Hawkesbury for the instruction of public-school teachers during the Christmas vacation. These courses of instruction commence at the beginning of January and last for a month. The number of students is limited to one hundred, and preference is given to teachers whose schools are situated in agricultural districts, or who have already commenced the teaching of elementary agriculture in their schools. The teachers reside at the College during their visit, and the cost of their accommodation is paid by the Department of Education. The following is a brief outline of the course of their instruction:—

Lectures are given by the Principal on the agricultural aspect of primary education; elementary phases associated with dairying; bacteriology in relation to dairy farm and home life, with microscopic and lantern demonstrations; feeding of stock; the laws of breeding; irrigation; and such subjects as agricultural education as practised in other countries, such as England, United States, Canada, and the Continent of Europe.

The principal object of this school is to enable teachers to deal with nature-study and the study of plant and animal life in their schools. Outdoor instruction is also given each day by a walk in the country, when lectures are given on country matters.

I understand that these classes are very fully attended by teachers, and I consider this undoubtedly one of the most important and far-reaching features connected with Hawkesbury College.

I think I have now completed a description of the work at Hawkesbury College, which may be briefly summed up as (1) the diploma course of practical and theoretical work combined of three years; (2) the alternative courses in minor branches of farming; (3) the dairy school for managers and teachers; (4) the rural camp schools; (5) the farmers' winter schools; and (6) the summer school for public-school teachers.

Part II.—The General System of Agricultural Education in Vogue in New South Wales.

The New South Wales Department of Agriculture was started in 1890, when the Minister of Agriculture and Mines was appointed. A Superintendent was appointed to organize the new Department, and it was administered by the first Minister for three years as a separate Department. A comprehensive scheme of agricultural education was arranged by the Government; the Hawkesbury Agricultural College was started; four experimental farms established; a scientific staff organized; and an *Agricultural Gazette* instituted.

In 1893, during a period of retrenchment, the Department was reduced, and the control was handed over to an officer of the Mines Department. This, however, did not prove satisfactory, and in 1908 a special Minister of Agriculture was appointed by special Act of Parliament. The Ministerial head of the Department is a member of Cabinet, the permanent head is the Under-Secretary for Agriculture, while the field-work is controlled by a Superintendent and Chief Inspector.

The Department has the administration of a number of Acts of Parliament, such as the Vines and Vegetation Diseases Act, the Commerce Act, Fruit-pests Act, Fertilizers Act, Pastures Protection Act, Stock Acts, and other Acts of a similar character.

There are six apprentice farm schools, two farm schools for the higher education of farmers and dairymen, and one College for practical and scientific teaching. Bursaries are given at

each of these schools—twelve altogether per annum—to deserving youths who could not otherwise get this technical education. The following are the names and areas of the farms under the control of the Department :—

	Total Area. Acres.	Area cleared. Acres.
1. Bathurst Experimental Farm	610	610
2. Berry Experimental Farm	407	350
3. Coonamble Experimental Farm	1,950	1,500
4. Cowra Experimental Farm	996	450
5. Duck Creek Cane Farm	476	100
6. Dural Demonstration Orchard	30	30
7. Glen Innes Experimental Farm	1,100	436
8. Grafton Experimental Farm	1,063	260
9. Hawkesbury Agricultural College Experimental Farm	3,250	1,000
10. Howlong Viticultural Station	200	60
11. Nyngan Demonstration Farm	6,000	300
12. Pera Bore Orchard	60	60
13. Raymond Terrace Viticultural Station	,632	25
14. Wagga Experimental Farm	3,228	1,300
15. Wollongbar Experimental Farm	268	240
16. Yanco Experimental Farm	2,000	500
17. Temora Demonstration Farm	1,600	...
18. Condobolin Demonstration Farm	1,350	...

I have noted these in order to give an idea of the area which apparently is regarded as being required in New South Wales.

A University Chair of Agriculture and also a Chair of Veterinary Science were founded in 1909 by the Government. There is provision made for research work and for field demonstrations, and the Department in other ways devotes itself to the development of the science of agriculture.

There is another institution to which I think I should refer, known as the Pitt Town Farm, which is controlled by the Labour Department. This institution deals with the boy who knows little or nothing about farm-life in Australia, and in a few months instructs him in the methods of carrying out farm-work. The boys are taken from the cities, and taught to be efficient farm labourers.

The total number of scholars under tuition during the present year at the various institutions is about 392, distributed as follow :—

	Number of Students.
Hawkesbury Agricultural College	200
Wagga Farm School	60
Bathurst Farm School	34
Cowra Farm Apprentice School	22
Glen Innes Farm Apprentice School...	24
Grafton Farm Apprentice School	18
Wollongbar Farm Apprentice School	20
Yanco Farm Apprentice School	14

This number is an increase on the previous year, and, generally speaking, there appears to be no difficulty in keeping up the supply of students.

Briefly this is the Government system in vogue in New South Wales.

Part III.—Impressions of Hawkesbury Agricultural College and the New South Wales System.

The first impression which I had of Hawkesbury College was that it was extremely well managed, and that the young men attending there were, as a class, of very fine stamp. On inquiry from Mr. Potts I was informed that about 40 per cent. of the youths were the sons of country selectors, farmers, and squatters, and the rest the sons of professional men, merchants, and others from the towns.

It appears that about 1,600 scholars have passed through the College in nine years, and of these about 75 per cent. have either gone on to farm properties of their own or become managers of farms or teachers in Australia or other countries. This, I think, may be regarded as satisfactory.

Students are found representing many parts of the world far apart from each other. There were students from South Africa (Boers), from Europe, Japan, all the Australian States, and New Zealand (including a Maori, who, I am glad to say, was very popular with both the students and the teachers).

Mr. Potts stated, when asked upon what principle he ran the College, that boys were taught on commercial lines, and that his aim was, first, to develop the character of the students; second, to maintain their good health; and, third, to provide them with an education in the science of agriculture, combined with a knowledge of outdoor work, which will enable them to become successful farmers. The work is practically divided into two classes — indoor work, which takes up three days in the week, and outdoor work on the farm the other three days (Saturday being partly devoted to sport or amusement).

I have already referred to the system of book-keeping on the farm. Mr. Potts appeared to be thoroughly alive to the importance of this in regard to every department under his control, and the test of "Will it pay?" or, in other words, "Will it be a commercial success?" is

applied to everything and is kept constantly before the youths. I consider that this is most important, as to my mind these colleges will do very little good unless they produce a class of men who will put their work to the practical test of its commercial value.

Hawkesbury College is, I understand, with one exception—namely, the one at Guelph, in Canada—the largest agricultural college in the world. By way of comparing these institutions it is interesting to learn the opinion of the Hon. G. E. Foster, Canadian Minister of Trade and Commerce, who recently visited Hawkesbury. That gentleman stated, "The Agricultural College [at Hawkesbury] struck me very favourably. The variety and thoroughness of the instruction given in a practical and experimental way seemed to me to be exactly what was required by the students to fit them for the actualities of the life they will lead on the farm. The students are not only initiated into a theoretical knowledge of the conditions of soils and the atmosphere, as well as the aid and hindrances that insect and bird life bring, but they are thoroughly versed in what may be called the rougher forms of construction and repairs of everything connected with the farmer's new life on his location. They are taught to make and mend harness, and to build gates and fences, and, in short, are given an experimental knowledge in all the different varieties of work which fall to a farmer's lot, together with that independence and self-reliance which give him a great advantage in a sparsely-settled country, where he cannot find foundries and factories and carpenters ready to hand. The students are also taught methods of preserving fruits of all kinds, and the making of cheese and butter. They are not only shown how to do all these things, but the excellence of the instruction is chiefly to be found in the fact that they are made to do it themselves, thereby becoming practical and obtaining confidence in the carrying-out of the more theoretical side of the work."

In answer to a question as to whether there were any agricultural colleges of this kind in Canada, Mr. Foster stated, "There are institutions in Canada which are more fully equipped, but taking all in all I doubt if there is any institution which attains the end aimed at—namely, to make the boy acquire the experience of all the actualities of a farmer's business—in the same way as the Hawkesbury College."

At Guelph I understand there are about 205 students in residence; at Hawkesbury about 200. The latter embraces about 3,500 acres of land; the former about 500 acres.

With regard to the cost of the Hawkesbury College, you will observe from the report of my last interview with Mr. Potts that it is somewhat difficult to estimate exactly what the cost of the College was. He stated that the original design was for a college to hold sixty students, and to cost £37,000. This, however, was not carried out, and the statement of accounts published in the annual report does not show the capital value. The following is the statement of total receipts and expenditure for the year 1911–12 :—

Receipts.	£	s.	d.	*Expenditure.*	£	s.	d.
Students' fees	3,970	7	0	Salaries	3,902	6	6
Winter school fees	205	16	0	Incidentals	9,599	17	4
Exchanges	5	3	8	Public Works Fund	4,743	5	8
Cash sales	3,221	5	7	Farm Account	5,245	4	0
Rent	94	3	6	Stores Supply Committee	1,677	12	9
Lighting	4	8	8	Resumed properties	61	9	0
Departmental farms	371	2	0	Departmental farms (transfers)	347	4	8
Balance	17,737	9	11	Consolidated revenue (refunds)	32	10	0
	£25,609	9	11		£25,609	9	11

Commenting on this statement Mr. Valder stated that the items of £4,743 5s. 8d. and £61 9s. charged against the "Public Works Fund" and "Resumed properties" respectively should be eliminated, leaving a debit balance of about £13,000, which may be taken as the actual cost of the College to the country for that year (1911–12).

A very careful system of book-keeping has been adopted at the College, and some branches show a profit, but it is obvious that where two hundred men are accommodated at an average of £20 a year, *including board and residence*, there must be a deficit at the end of the year. There must also be a loss on the winter school, for the farmers pay only a very small amount for their accommodation. In order to show how profitable some of the branches are, I quote the following statement of accounts for the orchard for 1911–12 :—

Dr.	£	s.	d.	*Cr.*	£	s.	d.
Brought forward from previous year (valuations)	385	8	10	Cash sales	782	8	4
Salaries, wages, and board	681	2	5	Transfers to other Government Departments	130	18	4
Supplies, &c.	322	16	7	College supplies and services	953	16	9
Water and light	25	0	0	Produce on hand	389	15	10
Horse labour	45	6	8				
College supplies and services	36	1	4				
Balance (profit)	821	3	5				
	£2,256	19	3		£2,256	19	3

You will observe that Mr. Potts stated that he considers a sum of at least £50,000 and an annual grant of £5,000 would be required to start a college in any way similar to Hawkes-

bury. This, of course, is only a very approximate guess of the cost of what the New Zealand Government propose to do, and is independent of the purchase of the necessary land.

The report of the Scottish Agricultural Commission of 1910–11, making reference to agricultural colleges in Australia, reads as follows, and may be of interest to you :—

"The Hawkesbury College, of New South Wales, is perhaps the most typical, as less attention is there given to theoretical teaching and research work, and more to instruction in field manual labour. It is remarkable not only in the extent of land which it controls, but in the peculiarly practical nature of the instruction and its adaptations to Australian conditions.

"In a new country a knowledge of fertilizers and feeding-stuffs is at a discount, and what is required by the farmer is an understanding of stock and implements and how to fend for himself when a hundred miles from blacksmith, joiner, or veterinary surgeon. In a new country a knowledge of the highest branches of agricultural science is of no less importance than in the old to the expert and to those responsible for the exploitation of untouched regions under unknown conditions. The Hawkesbury College does not supply such instruction, but within its own purely practical limits it is a magnificent success.

"The object striven for is a phenomenal efficiency in skilled labour, and that object is obtained. There are over a hundred horses at work on the farm, and every one of the two hundred students at the end of his course of three years has driven, fed, and groomed each of those horses; has worked, taken to pieces, and put together every implement; has made a complete set of harness (except the collars) for a pair of horses, and taken it away as his own property after paying for the material.

"The same principle is carried out in all departments. Every student not only feeds and looks after pigs, but kills, cuts up, and cures a pig, and assists in eating it. And as each pig bears the brand of the executioner, his name is published at breakfast on the morning when his handiwork appears before 199 hungry and jubilant judges. Thus efficiency is promoted. It is assumed that the student will take up land a hundred miles from anywhere, and therefore he must not only be able to shoe a horse but make the shoes. This he does. He also makes bits for the bridles, hinges for the gates, and even turns steel collars for bearings, and makes nuts, bolts, and rivets. After that woodwork is a mere recreation, and the manufacture of a wheelbarrow a kind of practical joke.

"The students built and fitted up their own gymnasium, and in addition grow their own fruit and vegetables, and preserve and cure raisins, prunes, pears, &c. They make their own jam, and revenge themselves by eating 13 tons of it per annum.

"Two hundred head of dairy cattle are kept on the farm. They include specimens of every breed, and the boys do the milking, manipulate two different mechanical milking-machines, and make butter and cheese.

"Any one who is a believer in the old system of several years' apprenticeship would receive a rude shock at Hawkesbury. In three years a raw lad becomes a first-class farm hand, shepherd, dairyman, and an expert butcher, saddler, joiner, and rough blacksmith. There is no doubt about his expertness. There can be seen a set of harness, as good as any from a shop, made in three weeks after the boy had seen a set of saddlers' tools for the first time.

"In the understanding of steam-engines, oil-engines, pumps, and electric motors the students obtain a thorough training, for all are used on the farm, and hence the boys use them all. The student becomes familiar with experimental work, for the fields contain hundreds of plots of wheat, oats, and rye under selection, and from the first of these two rust-resistant straws have been isolated recently. There are manurial plots also, and 150 different grasses and forage crops under observation. But the Principal, Mr. Potts, does not believe in specializing on experimental work in the meantime when the staff and funds are so urgently required for instruction.

"But all the time is not spent in manual labour. Three days a week and several evenings the students attend lectures, and do not go on the farm at all. On Saturday they play cricket, football, tennis, or golf, and wax famous on the College rifle range of 1,000 yards."

The hours of labour on the farm and in the workshop are forty-eight per week actual—eight hours and a half per day, except on Saturday, when they are five and a half. A number of excellent rules exist, some of which I would like to mention.

Students must appear neat and tidy during lectures. Students late at meals must be satisfied with whatever the head steward can give them. Students are not allowed to frequent hotels in town unless accompanied by parents or guardians. They are not allowed to bring into the College, farm, or buildings any spirituous liquors, nor are they allowed to have in their possession firearms of any description. They must attend Divine service once each Sunday. No student is allowed to bring any horse, dog, or other animal into the College or farm. Punctuality, order, and quietness have to be observed at all times. Smoking in bedrooms or using lights of any description other than those provided by the Department is prohibited. The habit of smoking is expressly discountenanced, and it is prohibited except in places set apart for the purpose. Students are not allowed leave of absence during the session except on important occasions, and with the full consent of their parents. Students in charge of animals must treat them in a humane manner. Students using tools and failing to return them to their proper places have to pay for same. Students are not permitted to invite relatives or friends to inspect the buildings or attend meals without permission from the Principal. Students are allowed access to all parts of the farm, but they may not disturb stock or leave gates open. They are not allowed entrance to either the kitchen or the laundry. I saw nothing but men servants in the College. Students are warned against keeping money in their rooms, and this is unnecessary, as a branch of the savings-bank has been established at the College. Any student who is guilty of profane or insubordinate conduct in or without the College, or who wilfully breaks

the rules of the College, is liable to dismissal by the Principal. Students are compelled to keep a farm journal from personal observation, and they must attend all lectures and demonstrations regularly and punctually. Students must obey the orders of the Principal and his staff. The Principal may at the close of any session direct that any student whose retention is unprofitable to the student himself, or injurious to other students, or prejudicial to the reputation of the institution, shall have his name removed from the College roll.

From my personal observation I should say that the system is successful, because the young men whom I saw there appeared to be physically, intellectually, and morally a class of youths of whom any country might be proud. As has been said with reference to them by a writer in a Home paper, "You will see there (at Hawkesbury) the coming maker of the Commonwealth, a piece of wiry, human mechanism, with brains and dash and independence; a thinker, a worker, a gentleman, who can be seen with his sleeves rolled up, as much at home in the cow-shed, in the pigsty, or in the blacksmith's smithy as he is in the lecture-room, notebook before him, listening to a dissertation on the classification of bacteria." The same writer says, "Half a dozen such colleges in England would in twenty years revolutionize the methods and manners of agriculturists. By means of such colleges Australia is supplying to the sons of its people whose instincts are towards the bush rather than the city, the plough instead of the music-hall promenade, a first-class chance of developing the muscle and mind of the young men, and turning them into not kid-gloved, scholarly, airy gentlemen, but vigorous, intelligent, practical, sober, and efficient farmers."

I also desire to quote the opinion of Mr. James Dunlop, one of the Scottish Commissioners, who said, "Hawkesbury College is one of the finest agricultural colleges in the world. There is nothing superior to it in Canada or the United States."

I may also say that since the opening of the College nearly six hundred public-school teachers have attended the summer school, and about the same number of farmers the winter school. Ex-students are to be found occupying Government positions in New South Wales, Queensland, South Australia, Western Australia, New Zealand, South Africa, and Soudan. Many of them are farming in all parts of Australia, and as far afield as British East Africa, New Caledonia, India, Cape Colony, and the Philippine Islands.

It would be impossible to conclude this brief description of Hawkesbury without reference to the Principal, Mr. Potts, who, I believe, is a native of Northumberland, England. As was remarked by one of the Scottish Commissioners, "Mr. Potts, the Principal—he is the College." He struck me as being a man extraordinarily well adapted to such a position; a keen agriculturist, a student, a lover of animals with a great knowledge of their points, and a born organizer and teacher. It is a combination rarely to be found.

Mr. Potts has occupied various positions in connection with agriculture in the Australian Colonies, and came to Hawkesbury in 1902. Since then the institution has flourished, and has now reached the proud position of being the best agricultural college in the world. He turns out men from his College who are a credit to him, and what to my mind was most satisfactory was that through his efforts there can be no doubt a very high tone exists amongst the students at Hawkesbury. There are few men to whom it is given to see such excellent results from their labours as Mr. Potts.

Before concluding I would like to refer to the difficulty of determining the cost of the Hawkesbury Agricultural College. I would suggest that if colleges are erected in New Zealand separate accounts should be kept of what may be described as the experimental or strictly demonstration portions of the work in addition to the ordinary farm accounts. In support of this I desire to quote from the financial statement for 1911–12 appearing in the "Annual Report of the Department of Agriculture of the Union of South Africa," which I have received from the Hon. the Minister at Cape Town. On page 556 (Public Accounts Committee), referring to a recent inquiry into the cost of educating students attending agricultural schools (at Potchefstroom), the following appears:—

"In order to supply this information it was necessary that the school accounts be kept as distinct from the farm accounts and accounts of other divisions. Although this is under ordinary circumstances not easily done, the organization of this institution and the system of accounting have permitted the necessary allocations being correctly made. In the statement presented herewith it is shown that the cost of maintenance is £53 3s. 10d. and the cost of education £60 18s. 10d. per capita per annum, or a total of £114 2s. 8d., of which £50 is remitted in fees. This leaves a balance of £64 2s. 8d., which represents the cost of each student to the public purse. If interest on buildings be charged this amount is raised to £102 8s. 7d., as explained in the statement."

It is interesting to note that the cost at Hawkesbury, taking £13,000 divided by 200 students as the basis, runs out at about £65 per head per annum; but this is not a true estimate of the value of the College, because the winter and summer school work and other works carried on there should be credited to the establishment.

Having now observed the conditions existing in Australia, there are one or two points in connection with the establishment of similar institutions in New Zealand which I think I should mention.

The conditions, of course, are very different in New Zealand from what they are in Australia, and this has to be remembered when the question of organizing a system of instruction at a college is determined. For many years—perhaps for all time—the bulk of New Zealand farmers will be pastoralists, not agricultural farmers; and to these men, while an intelligent knowledge of the science of agriculture is valuable, still the practical work such as is taught at Hawkesbury would be of even greater use. I take it that our aim in New Zealand should be to provide an education for young men who are either going on to agricultural farms or to take up bush farming, and for the latter the practical training of Hawkesbury would be invaluable.

A young man who can put up a good fence, build a house, kill and dress a bullock, pig, or sheep, measure up tanks, do concrete-work, and has even an elementary knowledge of surveying, and who in addition to this has a practical knowledge of the points of horses, cattle, sheep, and pigs, and been trained for three years to a system of keeping accurate books by which he can determine the profit or loss from the breeding of any of these animals, is well equipped to farm land profitably anywhere. But, in addition to this, as has been shown at Hawkesbury, such a College performs splendid service for the country in providing instruction in winter and summer schools, rural camps, and so on.

Bearing all these things in mind I think it is safe to say that our colleges should be as central as possible in their situations, should be near a railway-station, should be about 1,000 acres in extent, and should consist of mixed qualities of soil and not too fertile.

I have no hesitation in recommending that the lines adopted at Hawkesbury be followed as closely as the conditions will permit. As a practical farmer myself, I appreciate thoroughly the enormous advantages a young man would have who had been trained at Hawkesbury as compared with the man who had not been so trained.

If the Government decide to follow this course I would suggest that teachers trained at Hawkesbury, other qualifications being equal, should be given preference for appointment.

In conclusion, I desire to say that my visit was necessarily a brief one, but I have endeavoured as far as possible to quote documents issued by the Department of Agriculture in New South Wales in order to ensure accuracy in this report. If any mistakes have occurred I think they will be in minor points.

Besides the publications mentioned in this report, from which I have taken information and figures, I desire to mention the following as having been of help to me: Report of New South Wales Department of Agriculture, 1912; Catalogue of Departmental Exhibits at Royal Agricultural Society's Show, 1913; "Australian Aspect of Agricultural Education," by H. W. Potts, F.C.S., F.L.S.

Trusting this report will be of service,

I have, &c.,

EDWARD NEWMAN.

The Hon. W. F. Massey, Minister of Agriculture, New Zealand.

AGRICULTURAL EDUCATION IN NEW SOUTH WALES.

THE HAWKESBURY AGRICULTURAL COLLEGE.

Information supplied by the Principal, Mr. H. W. Potts, F.C.S., F.L.S., J.P., in reply to Questions asked by Mr. Edward Newman, M.P., representing the Minister of Agriculture for New Zealand.

Mr. Newman: The New Zealand Government want to know what is the cost of this College?

Mr. Potts: The capital cost has been very heavy, for the reason that the College was started in only a small way, temporary buildings only being put up. The original design was for a college to hold sixty students and to cost £37,000. The country could not look at this sum at that time, and the Government of the day spent £4,000. Through subsequent pulling-down and rebuilding the cost has been pretty well doubled, so that a fair statement of the actual cost could hardly be given without being misleading as an estimate for putting up a similar college.

Mr. Newman: Can you give an estimate for a college of 100 boys?

Mr. Potts: I would recommend not to start under £50,000 in New Zealand. This initial cost would, of course, have to be supplemented by an annual vote as the farm developed. That, however, could be allocated later on. I think it would be foolish to attempt to start on less than £50,000. For 100 boys I think you would want an annual grant of £5,000. The maintenance and education of students here costs £20 a year on the average (£30 for the first year, £20 the second, and £10 the third).

Mr. Newman: What is the financial result of the institution every year?

Mr. Potts: The details of that will be found in the annual report (statement of receipts and expenditure). This, however, is not a statement of assets and liabilities. When the farm was taken over the greater portion of the land was valued at 15s. per acre, but as a result of better markets, &c., I think that if a revaluation were taken the land would be worth £5 an acre. This is due to the fact that we have used the students in fencing, ringbarking, grubbing, &c. Every year so much permanent improvement has been made, which goes to increase the value of the farm. In addition we have used the students for putting up buildings, gate-making, and other improvements. A dam has been put into a paddock where there was no water-supply of a permanent nature. This is all done by student-labour.

Mr. Newman: How many boys are there in residence now?

Mr. Potts: We can accommodate 200, and there are about 180 here just at present.

Mr. Newman: What class are they drawn from?

Mr. Potts: About 40 per cent. from country selectors', farmers', and graziers' sons. The balance are from sons of Civil servants, lawyers, bankers, merchants, traders, and others.

Mr. Newman: What percentage of the students become farmers?

Mr. Potts: We have turned out about 1,600 students, and up to nine years ago we had no means of getting accurate figures. But about nine years ago a journal was started which every month contains columns giving particulars of the whereabouts and employment of old boys. A register has been started and definite information has been gained, showing that about 75 per cent. of our boys are on properties of their own or occupying responsible positions as managers of properties or acting as teachers in this and other countries. (See page 52 of the journal for April.) A certain percentage of the lads fail to get their diploma, but a few years ago an entrance examination was inaugurated, and it has had the effect of getting a better class of student (*i.e.*, of a better educational standard). It ensures a grounding in subjects of an academic nature that enables them to understand better the subjects we teach. We feel that it is our duty to give the boys a sound training in engineering, motor-ploughing, milking by machinery, &c. Machinery should be introduced at every point, and we feel that it is the duty of the College to make the students feel conversant with machinery in every phase of farm-life.

Mr. Newman: Is the aim to produce farmers or teachers?

Mr. Potts: Farmers. But every year some boys show that they are suitable for teaching purposes. A lad is found to be naturally endowed for the calling of a teacher. When we find a boy like that we get him as a teacher either for this College or elsewhere. Special instincts are necessary for teaching.

In reply to a further question Mr. Potts stated that the boys were taught on commercial lines. The aim is, first, to develop character; second, the maintenance of a robust form of health; third, a strictly technical training, the object being a good sound knowledge theoretically of the principles underlying all the operations and manual dexterity in all operations of the farm and in the management of live-stock, so that when a boy leaves the College in possession of the diploma we have the utmost confidence in his capacity to earn his own living on the land or to occupy some responsible position in managing a property. We are particularly careful about the practical aspect of his training in this country, where we have continuous sunlight and the advantage of an immense area of land attached to the College, with a good type of draught horse, so that there is ample opportunity of turning out a lad thoroughly skilled in practical work.

Mr. Newman: When a boy arrives here, what is done with him first? That is, a boy who says he wants to be a farmer?

Mr. Potts: He has to go into the first-year class, the indoor work of which is disclosed in the curriculum, and in which his primary education is directed towards the practical side of life. Take, for instance, his school geometry: it is utilized for the purpose of teaching him elementary surveying, in taking out the area of a paddock, the contents of a dam, or a stack; further, by its use he can apply himself to the taking of levels by means of the dumpy, and if he wants to do a little irrigation on his farm, instead of employing a licensed surveyor at three guineas a day, he does it himself. Then, again, farm book-keeping, which is an important essential in the commercial management of any farm, is taught; also elementary chemistry, elementary agricultural botany, and elementary agricultural entomology. Then, on the farm he is taught to milk in the first year, he is taught to handle horses, and later on the use of a single-furrow plough, the light implements, such as cultivators and scarifiers, and he is steadily introduced into the various sections of farm activities. The second year provides a higher education, both on the farm and indoors. The second and third years' work become more interesting, in so far as the principles laboriously inculcated in the first year are applied in various operations in the second and third, and become more attractive and intelligible. For instance, in agricultural chemistry, after going through the elementary course, the students are taught the analysis of dairy-products, such as the fat-content of milk, estimating the moisture in butter, the mechanical analysis of soils, soil physics, and the chemistry of manures as applied commercially; and towards the end of their full course the commercial aspect of the training is fully discussed.

Mr. Newman thanked Mr. Potts for the information imparted.

Information supplied by the Acting Under-Secretary and Director of Agriculture, Mr. George Valder, in Reply to Questions asked by Mr. Edward Newman, M.P., representing the Minister of Agriculture of New Zealand.

In connection with Mr. Potts's remarks regarding expenditure on the Hawkesbury College I would refer you to the annual report of the Department, copies of which I am forwarding. On page 2 you will find a statement of the total expenditure of the College and experiment and demonstration farms, &c., up till the 30th June, 1912. As stated by Mr. Potts, however, it must be remembered that included in this are buildings which have long ago been pulled down, and in consequence of putting up temporary buildings and adding thereto it is difficult to get at the actual cost of the present buildings on the farm.

With regard to the balance-sheet, it will be noted that under "Expenditure" are included items for permanent works and purchases of land, &c., and in order to get at the actual expenditure and revenue for the year these should be omitted.

In connection with the College the extreme poorness of the soil makes a very great difference to the cost of working, as it means a heavy expenditure for manure, and often without a comparative result in consequence of the liability of the district to drought.

Then, again, the College does an immense amount of educational work, not only for the resident students, but also for visitors, such as farmers attending the winter school, the teachers'

summer school, and the rural camp school. This means a heavy expenditure, for which there is no monetary return. Particulars regarding the winter school and the teachers' school are given in the College calendar.

We also usually have in residence a number of public-school teachers from the Teachers' Training-school, who stay at the College for nine months, and who make a special study of agricultural instruction.

On reference to the statement on page 77, for instance, with regard to the receipts and expenditure of the College, if we eliminate the items "Public Works Fund" (£4,743 5s. 8d.) and "Resumed properties" (£61 9s.) we leave a debit balance of nearly £13,000, and this may be taken as the actual annual cost of the College to the country. Considering the vast amount of educational work done by this institution the expenditure is comparatively small.

Besides the Hawkesbury Agricultural College we have two farm schools and five farm apprentice schools. The farm schools are situated at Wagga and Bathurst; the former has accommodation for sixty boys, and the latter for thirty-four, whilst the apprentice schools accommodate about twenty to twenty-five on the average. The Hawkesbury College and the Wagga and Bathurst Farm Schools are practically always full, the applications generally being in excess of the accommodation. The apprentice schools, which have only been recently started, are not yet full, but they are rapidly filling, and there is every evidence that within the near future they will barely accommodate the number applying.

The Hawkesbury is the highest class of school, the fees being £60 for three years. Students here work alternate days indoors and out, the three days indoors per week allowing of a considerable amount of theoretical training.

At the farm schools, although the students receive a fair amount of theoretical training, they work outside every day, and most of their instruction is given at night, with occasional classes when they can be spared in the daytime. The fee is £15 for the first year, and students who gain a satisfactory report at the end of that period are allowed to remain a second year without fees.

At the apprentice schools the charge is £5 for the first six months, and if the apprentice obtains a good report he remains a second six months without fees. The reason for the low fees at these schools is that the students do a considerable amount of practical work, and it is considered that this nearly compensates for the cost of keep and instruction.

The balance-sheets of the Wagga and Bathurst farms are given in the annual report, but with regard to the apprentice schools, as they have only lately started, their financial statements will give little idea of the cost of instruction. For the past five years, in the position of Superintendent and Chief Inspector, I have been continually travelling in all portions of the farming districts of New South Wales, and during this time I have met hundreds of the old boys of the Hawkesbury College who are settled on the land, have inspected their farms, and frequently came into contact with their work. From my observations of their operations I have no hesitation in saying that they are doing an immense work for the country in improving our methods of cultivation, &c.

The apprentice schools were really started with the object of taking boys who were brought out from England by the Dreadnought Fund trustees for training in farming, it being proposed to bring out at least a hundred a year. So far, however, very few have been sent out by the trustees, and as a local demand set up we have placed some seventy-five boys at these schools, and now have only room to accommodate fifty "Dreadnought" boys. The Dreadnought trustees referred to are the trustees of the fund raised for the purpose of purchasing a "Dreadnought" for Great Britain. The money not being required for this purpose, a portion has been allotted to assist boys to come out to Australia, get a short training in agriculture, and then take up employment on farms.

It is found that ex-students of the Hawkesbury College, who since leaving that institution have had practical experience and have continued their agricultural studies, prove invariably to be the best men to take up positions such as managers of experiment farms, inspectors, experimentalists, and teachers. As a result they are now given preference when applying for such positions, and a very large percentage of the field and scientific officers of the Department now are ex-students of the College. In training these men the College has undoubtedly rendered excellent service for the Department. Had it not been for these men we should have had the greatest difficulty in obtaining qualified officers, and in many instances would have had to import them.

Under the Department of Public Instruction a school has been started, known as the Hurlstone Agricultural High School, which caters for boys between the ages of fourteen and sixteen—that is, their age at the time when they usually leave school till they are old enough to go to the College or farm schools. The students from this school have proved some of the best that have gone to the College and farms. During the past few years since the school was established they have occupied some of the leading places at the annual College examinations. This school has been so successful that it is the intention of the Government to start several others on similar lines. The reason for the fee being so high at Hurlstone (see copy of prospectus) is that there was only a small area available for cultivation, and the training was principally theoretical, and there is very little return from the land. If a more suitable area for farming purposes were made available the fees could be correspondingly reduced.

If a boy passes the examination at Hurlstone at the end of the two-years course he is exempt from the first year's training at the Hawkesbury College, and can therefore obtain his diploma there in two years instead of three.

There is another school, known as the Pitt Town Training School, which comes under the Labour Department. For this school boys are brought out from the Old Country, and are

placed on the farm there for a period averaging two to three months. They are trained to handle horses, milk cows, and in the general management of stock, as well as receiving a little instruction in cultivation.

I recognize that if the farms put a considerable area under cultivation, and this is devoted to raising special crops for which there is a great demand, and which in my opinion the Department should endeavour to meet, the revenue will be considerably increased. I have already commenced on this policy, and even in the balance-sheet which will be published after the end of this month shall be able to show that the expenditure has decreased and the revenue increased.

The special crops I am speaking of consist principally of seed wheat. We breed and produce large quantities of seed wheat, utilizing for this purpose a total area of some 2,000 acres on our various farms. The demand for this seed is very great, and during the past two or three seasons we have been unable to supply one-tenth of the quantity applied for, in spite of the fact that we charge a fixed rate of 6s. per bushel. It can be understood that growing large quantities of seed wheat at this rate can be easily made a commercial success. There is also a considerable demand for purebred live-stock, including horses, dairy cattle, sheep, and pigs, which is greatly adding to the income of the farms.

I am quite satisfied that the training at the Hawkesbury and the other schools is turning out practical farmers, and that the policy should be pursued by the Government.

With regard to the number of students, I would rather take a hundred at first, and if the demand for accommodation should exceed this would start farm schools and raise the status of the College.

I agree with Mr. Potts's estimate of £50,000 for initial outlay and £5,000 per annum.

COPY OF LETTER FROM MR. H. W. POTTS, PRINCIPAL OF HAWKESBURY AGRICULTURAL COLLEGE, TO MR. NEWMAN, M.P., DEALING WITH THE COST TO THE STATE OF THE COLLEGE.

Department of Agriculture, New South Wales,
Hawkesbury Agricultural College, Richmond, 25th July, 1913.

DEAR MR. NEWMAN,—

I read your report through last night, and noted one matter that ought to be made fairly clear in case it injures the impression you desire to convey. The point you make is that it costs the State £65 per annum for each student. You suggest that the intermediate schools will affect this estimate—*i.e.*, winter, summer, and rural camp schools—but I desire to point out that there are other expensive items to be considered. We will take a few that just occur to me from memory:—

1. Visitors for the half-year ending June, 1913, number 3,310. These are brought from the train in College or hired vehicles. They have luncheon, afternoon tea, and are sent back to the train at 4 p.m. Occasionally a farmer or two, or several, will announce that they have been unable to gather enough information, and with this legitimate excuse they stay overnight and are afforded every opportunity of solving problems for the solution of which they have journeyed long distances to the College. Again, every week-end we entertain clergymen, public speakers, professors, entertainers to assist at our weekly concerts, Christian Union gatherings, &c. Conferences are held here by Ministers and delegates to various bodies, such as Shire Councillors, annual conference farmers and settlers, fruit associations, irrigation conferences, poultry conferences, &c. The latter numbered 400, and we spent £10 in vehicles alone. These conferences are valuable, but it is not fair to charge students with them.

2. This is an experiment farm, where we have set apart two professional officers, a staff of men, horses, vehicles, and equipment especially engaged to determine phases of agricultural work for the farmers of the whole State. 160 acres are under intense culture; four to five hundred varieties of wheats especially bred here are tested; oats, ryes, maize, millets, sorghums, root crops, grasses, &c., are subjected to test, some of them extending over ten years, to get them acclimatized and then test their commercial value. All fruits are tested, and every variety of any note subjected to a market-value test. For instance, we have absolutely tested the bearing capacity of 120 varieties of peaches alone. Some are valueless, and others good. Our results are made available to the man on the land. It is expensive, but it is better for one central institution to conduct reliable investigations than to have hundreds of struggling producers floundering about and wasting time and money.

3. In stock we have proved by actual test the class of stock most suitable for men in certain climatic and geographical areas, determined their limitations, and rejected any showing weaknesses. Such have been conducted in sheep suitable for our coastal areas and in draught horses, selecting the Romney Marsh in the one instance and the Clydesdale in the other. In pigs we discarded small Yorkshires, Essex, and one or two other sorts. In poultry we conducted tests spreading over fourteen years, and have made many practical bases, all of commercial value. Angora goats were rejected after seven years' test. All this class of work is costly: why charge the students with it? In plant-diseases, in testing new manures, sprays, and other research work we have kept a staff employed. In veterinary work we have conducted research work in tuberculosis, contagious mammitis, and other diseases, all entailing special rates. One-fifth of the matter appearing in our monthly *Agricultural Gazette* for farmers is written by members of our staff.

4. We have from eight to fourteen free bursars—sons of poor but deserving citizens, chiefly widows' sons—who have distinguished themselves in the public schools. It is not fair to charge their annual cost to students.

These are a few items of expenditure that occur to me at present, hence it is difficult, you will see, to arrive at a fair figure to charge students with the cost of work in which they are not concerned. I am quite certain of this: that, apart entirely from the educational work being conducted, the College has proved a benefit to the farming community here, so much so that they fully appreciate it.

In conclusion, let me point out that the summer-school teachers have their course here free; no charge is made for board and lodging. The winter school for farmers is only a charge of 10s. per week. Well, there is a dead loss on that, and no return. The six hundred rural-camp-school boys add no revenue to the College funds.

We are not agitating to have any fees increased, but feel that the expenditure is fully justified by the material benefit it is to the country; the absolute value is an unknown quantity.

With very kind regards, &c.

E. Newman, Esq., M.P., Wellington. H. W. Potts.

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