ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE

YEAR 1896-97.

REPORT OF THE UNDER SECRETARY FOR AGRICULTURE.

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TO THE HONOURABLE THE SECRETARY FOR AGRICULTURE.

Department of Agriculture,
Brisbane, 30th June, 1897.

SIR,—I have the honour to submit the tenth Annual Report of this Department, a circumstance which marks the completion of the first decade of our history and operations, and in doing so, to state that it is very gratifying to be able to report that in no single year of that period has so much progress been made, or has evidence of vitality been so manifest. The completion of the Agricultural College, with the appointment of the necessary teachers, the successful operations there, under adverse climatic conditions, the formation of a pure-bred herd of dairy cattle, and the establishment of experiment stations or State farms at Westbrook and Hermitage, are a clear indication of present progress, which will, without doubt, result in great benefit to Queensland. The returns in the different branches of agriculture have upon the whole been satisfactory to the farmers, though at one time, during the spring, it was feared they would have been otherwise. The dry spell experienced at that time caused fears to arise that the wheat crop, upon which so many of our farmers to a great extent depend, would have been a failure, not only on account of the loss of the crop, but also on account of the larger area that would in that case have been unproductive, for more land was seeded to wheat during 1896 than in previous years. Had the crop failed, the cultivation of wheat in Queensland would have been set back many years; fortunately, however, the rains that fell towards the end of October last were spread over the settled portions of the colony, and saved the wheat crop in so far that a fairly average return was obtained, saved the potato and early maize crop, and stimulated the growth of the lucerne and natural grasses.

CONFERENCES.—Conferences of farmers have many times been initiated by this Department, and have been held in many parts of Queensland; but none of them have been so successful as the Conference held at your invitation on the 10th, 11th, and 12th of the present month, at the Agricultural College. Former conferences have all been what may be termed district conferences, and only included, excepting departmental officers, local residents; but this Conference, composed as it was of representatives from the Agricultural Societies throughout Queensland, and held at the College, whereby the delegates were able to acquire a knowledge of the instruction it is intended shall be given to the students thereat, will be the means of diffusing information concerning the practical benefits of this institution to a far greater extent than any quantity of advertising and the distribution of printed matter. The delegates separated with far different ideas upon this subject from those held by the majority at the time of meeting. The papers at the Conference proper were well selected, ably written, and intelligently discussed, so that although actual observation dispelled many mistaken opinions concerning the nature and the site of the College, the interchange of ideas, with the consequent friendly intercourse, benefited those who attended, and will secure results that could not otherwise have been obtained.

At the Second Intercolonial Fruit Conference, held in Wellington in May of last year, it was resolved that the Conference of this year should be held in Sydney; but as the Government of that colony was not inclined to give effect to the suggestion, it met in Brisbane at your invitation on the 18th of the present month, and, excepting Sunday and Jubilee Day, sat upon each succeeding day up to and including the 26th instant, the sessions being held in the evening

as well as during the day. Many papers touching on various phases of the fruit industry were read and discussed, and when the recommendations of the committee appointed by the Conference to formulate resolutions are submitted to the Governments of the Australasian colonies, it will be seen that beneficial results have accrued from this meeting of fruitgrowers. The Conference was a large one, the delegates numbering over 100, of whom seven were from New South Wales, seven from Victoria, seven from South Australia, four from New Zealand, and two from Tasmania. In connection with the Conference, a fruit show was held in the International Exhibition Building, which it is assumed was the most comprehensive show of its kind that has ever been held in Australasia, for fruit representing the temperate, sub-tropical, and tropical zones, all of most excellent quality, were there seen in great profusion. Queenslanders who visited the show saw a display of apples, pears, oranges, and dried fruits such as they had never seen before, and our visitors from the south made the acquaintance of many of our fruits of which they had no knowledge, and thus the benefit arising from the display was mutual. The papers read and discussed at this and the Agricultural Conference will in due course be printed, and be at the service of the public. The recommendation arrived at, that the next Conference should be held in Sydney, was, it is submitted, a wise one, for the reason that although the Brisbane meeting was the third that has been held, the first and second conferences appear to have only paved the way for the practical results which I am hoping will follow the one that has been held here, and there are many matters in connection with the industry that have only been touched upon, and can only be practically worked out by the larger experience gained by frequent and timely meetings for discussion and action.

Dairying.—The great feature of the dairying operations during the past year was the advantage taken by the butter factories in January last of the facilities for cold storage upon the steamers of the British India Steam Navigation Company, whereby some 63 tons of butter were exported to England under the Meat and Dairy Produce Encouragement Act, and which, notwithstanding that it arrived at a dull time, realised satisfactory prices to the exporters.

The companies participating in this venture were the Central Downs Dairy Company, Limited, of Allora; the North Ipswich Butter Factory; the Silverwood Butter Factory, of Toowoomba; the Lowood Creamery Company, of Oxley; and the Queensland Model Dairy and Fresh Food, Ice and Cold Storage Company, of Brisbane. The export of dairy produce under the provisions of the Meat and Dairy Produce Encouragement Act has been, up to the present, very intermittent; and if Queensland is to secure a recognised place in the home markets, the trade will have to be more regular, for it cannot be expected that the merchants in the United Kingdom and elsewhere will give the same attention to a chance trade as now exists with Queensland, when they can have regular supplies from Denmark, France, and other countries upon which they can depend; but it is anticipated that with the increased supply of the raw product that can be looked for, and the greater use of the cold storage, the export trade will be more regular, and Queensland will occupy, before long, the recognised place in the home dairy market which the conditions of our climate and the value of our natural grasses for dairying warrant. The exports under the Act up to the 30th June instant have been about—1895, butter, 9½ tons; 1896, cheese, 1½ tons; 1897, butter, 64 tons net weight.

The Travelling Dairy concluded operations during this year, particulars of which will be found in the Report of the Dairy Instructor, and the plant has been laid up. Mr. Mahon and his assistants have since been continuously employed in giving instruction in dairy matters in different parts of the colony, and in other duties in connection with dairying generally, excepting that for a part of the time Mr. Mahon visited the southern colonies, on leave of absence, rendered good service by the purchase of the nucleus of an admirable herd of pure-bred Ayrshires, and in other matters which may eventually prove of great

value to Queensland. The value of co-operation in dairying is apparently becoming more understood by farmers, and the signs of the times are that the proprietary factory will sooner or later give place to the co-operative factory. The sugar-cane growers have learned this lesson with the assistance of the Sugar Works Guarantee Act, and why should not the dairy farmers of the South do the same with the assistance of the Act framed for their benefit? But before they achieve the full value, greater attention will have to be paid to feeding, housing, and to the breeding of their stock, for, without these essentials of a successful dairy farm, no man can hope to reap the full reward for his labour. Attention has more than once been drawn to these points in my Reports, and they are so important that I feel warranted in again referring to them. A tendency is, however, clearly apparent towards the improvement of the dairy herds, and the breeder of first-class stock has little difficulty in disposing of good milking cattle in one place or another, but more particularly in the neighbourhood of the factories, where the farmers have realised that it takes as much labour to attend to a poor milker as to a good one, but with far different results. A further opportunity is now offered to the dairy farmers in the East and West Moreton districts, on the Downs, and in the Maryborough and Bundaberg districts to found a good dairy herd, by the offer made by you of a pure-bred Ayrshire bull for competition upon certain conditions, which have been conveyed to each of the agricultural societies in the districts interested. No competitions have yet been decided, and no prize has been yet awarded, but the interest therein has been great, and the competition will, it is hoped, be keen.

The following extracts from a report of Messrs. Weddel and Co., of 16 St. Helens Place, London E.C., concerning the butter and cheese market in Great Britain, is of so much value to the dairy trade of Australia that they are here inserted for the information of Queensland dairymen. The report generally is upon the season 1895-6:—

The colonial butter season just over has witnessed the first check to that extraordinary development which has characterised the importation of Australian butter into the United Kingdom ever since its commencement in 1887. For the previous five seasons the import had gone on with marvellous rapidity until it reached the large total of 29,000,000 lb. The severe drought, however, which lately afflicted several of the Australian colonies has temporarily retarded this development, and for the season lately closed only 17,000,000 lb. were received. Victoria, the principal butter-producing colony, instead of exporting to the mother country over 10,500 tons, as in the previous season, shipped only about 7,000. New South Wales sent 50 tons instead of 1,300; and South Australia 350 in lieu of 580. New Zealand, on the contrary, not being afflicted with drought, increased her shipments from 2,305 tons to 2,558. The total deficiency from Australasia for the colonial season (September, 1895, to April, 1896, inclusive) amounted to 5,000 tons. This shortage was foreseen in Europe early last autumn, and produced two important results. The Danes, who have been watching with great anxiety the growth of the colonial butter trade, were advised from Australia of the position of affairs, and believing they had the winter's trade very much in their own hands, in October rushed up the wholesale price of Danish butter in Copenhagen to 133s., which was higher than it had been for years, while in London it rose to 142s. The Copenhagen committee, however, over-reached itself, for the rise in values speedily brought in larger imports from other sources, notably from the United States and Canada, which together in October and November sent 3,340 tons against 626 for the corresponding months of the previous year. The shortage from Australasia for these two months being only 396 tons, this great influx of American and Canadian butter reduced values rapidly, and Danish fell 25s. per cwt. in Copenhagen in fourteen days, but not before the rise had done great harm to the genuine butter trade, by giving an enormous impetus to the sale of "pure margarine" and "margarine mixtures." The extent of this injury may be calculated from the fact that, notwithstanding the short supplies from Australia and the subsequent falling away of the American import, the Danish quotation remained, from 1st November until 16th January, considerably under the prices of the previous season—in reality an average of 7s. per cwt. under. Thus, owing to the action of the Copenhagen committee, the deficiency of the Australasian supply, instead of benefiting the Danes by raising the value of their product all through the season, did them an irreparable harm.

Unfortunately, the injury thus caused to the Danish trade reacted disastrously upon the Australasian producer, for the low prices of Danish kept colonial butter for months at fully 5s. per cwt. less than it would have been had a more reasonable policy been followed by the committee. In February a second attempt to raise values in Denmark, though to a less extent, brought about results similar to the first. The United States and Canada in February and March sent 1,069 tons, against 118 for the same months of last year. Copenhagen prices of Danish again fell, and during April and May averaged 2s. 6d. per cwt. below the values of the corresponding period of 1895.

The colonial season, though very disappointing in the matter of supplies, was on the whole fairly satisfactory regarding values, which were considerably higher than those of the previous season, the rise in choicest Australasian averaging 6s. 6d. per cwt., and other grades benefiting to an equal or greater extent. Probably the butter that brought the greatest profit to shippers was the ordinary grade, which is unsuitable for counter butter but valuable for cooking and manufacturing purposes. There was a great scarcity of this class, and prices were, in proportion to finest and choicest grades, far above their intrinsic values. Choicest grades all through the season found a ready sale at good prices, and when Danish rose so high in October, colonial reached the unprecedented figure of 130s., which was maintained for three weeks. During this time, Danish was selling in London from 136s. to 143s., and French (fresh) at 144s. 8d. The London wholesale average prices of the choicest qualities of these three butters for each month of the colonial season were as follows:—

	Sept.		Oct.		Nov.		Dec.	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
French	131	10	142	4	136	3	135	4
Danish	112	0	128	6	118	0	112	6
Australasian	103	0	125	0	115	2	108	6

	Jan.		Feb.		March.		April.	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
French	144	8	144	8	135	4	127	2
Danish	115	6	113	6	110	6	98	3
Australasian	111	6	103	6	103	0	96	6

It will be noticed with pleasure and pride by the Australasian producer that colonial butter ran Danish very close in value, the difference for the whole season averaging only 5s. 4d. per cwt. The quality of colonial butter, on the whole, has shown an improvement on previous seasons, more especially in choicest grades. Owing in a large degree, however, to the excessive heat in Australia, a far greater proportion than usual of Victorian butter has this season been more or less "fishy," or "cheesy," as it is called in Victoria. Some of the most careful factory managers, who have had good refrigerating plant and other suitable appliances, have been able to keep their butter absolutely free from this objectionable flavour. Every season's experience proves that this "fishy" flavour can be avoided by proper supervision, supplemented by good refrigerating appliances. Though shippers and speculators may occasionally profit by sending ordinary or secondary grades, which they have purchased at low prices, the producer will find that only choicest quality will bring him a satisfactory remuneration; and the makers of all other grades must ultimately go to the wall in the fierce contest for the British market.

The following table gives the quantities of butter imported during the last two colonial seasons, together with the increase or decrease from each country. These figures show that the heavy decrease from Australasia was much more than made up by the heavy increases from other sources of supply:—

IMPORTS of BUTTER for the LAST TWO COLONIAL SEASONS (SEPTEMBER to APRIL).

	Denmark.	France.	Sweden.	Australasia.	Holland.	Germany.	Russia.	United States.	Canada.	Belgium.	Other Countries.	Total.
Season.	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
1895-96 ...	39,761	15,138	11,026	10,142	5,709	4,666	3,917	3,894	1,577	1,514	1,154	98,498
1894-95 ...	36,352	15,228	10,104	15,075	5,200	4,720	3,107	394	899	1,061	667	92,807
Increase ...	3,409	...	922	...	509	...	810	3,500	678	453	487	5,691
Decrease ...	...	90	...	4,933	...	54	...	...	...	...	...	...

The extent to which the farmer in the Australasian colonies is developing his land largely on the lines of dairy farming for the purpose of supplying dairy produce to British markets, renders an inquiry into his future prospects a matter of very considerable interest. The permanent success of dairy farming in the colonies depends in the main upon two conditions—namely, the probability of the United Kingdom absorbing in the future as great a yearly increase in the importation of butter and cheese as has been received on average in the past; and the proportion of that importation which can be supplied by the colonies in place of foreign countries. To examine this all-important question satisfactorily, it is necessary to ascertain the capabilities which the United Kingdom possesses of satisfying its own requirements in dairy produce from its own native resources. To get an accurate record of the actual amount of butter and cheese produced yearly in the United Kingdom is impossible, as there exists no statistical information on the subject; and all that can be done is to make such a careful and comprehensive estimate as will on the whole be sufficiently trustworthy. During the last twenty years various agricultural authorities have turned their attention to this question of the home production of dairy produce; such as Professors Carroll, Long, and Sheldon; and Messrs. W. E. Bear, J. Algernon Clarke, J. C. Morton, R. Henry Rew, and Robert E. Turnbull. The mean estimates of these gentlemen give the yearly home production of butter as 92,000 tons, and of cheese as 120,000 tons; but as the annual consumption of butter in the United Kingdom is now about 215,000 tons and that of cheese about 230,000 tons, it is evident that the home production is insufficient to meet the necessities of the country, and therefore a very large amount of dairy produce must be annually imported. The researches of Messrs. Rew and Turnbull are the most recent and exhaustive.

Packages, Etc.—The mode of packing butter is now so well established and so near perfection that it seems impossible for any great advance to be made except in the package itself and the correctness of the weight in each box. On these two heads there is much to be done. The fluted box appeared to have great advantages for the distribution of cold air, but experience has proved its great defect, which is that, after being in the cold chamber for some time, the wood becomes very brittle, the flutings aiding the splitting up of the box, so that it is not strong enough to stand the usual treatment. The one main defect of all the boxes yet introduced is their weight. So long as it needs 10 lb. to 12 lb. of wood to carry 56 lb. of butter, there can be no claim to an ideal package. The 15,670 tons of colonial butter shipped to England last year took over 3,000 tons of wood to carry them. It should not be impossible to construct a box stronger than the present, but only half the weight, and thus save very largely in freight. This ideal box has still to be put on the market. Regarding correct weight, if every box of butter on its arrival in Britain contained 56 lb., and not over 56¼ lb., it would be a great advantage, as it would save many thousands a year to the colonies. The rule of the provision trade in England, when "averaging" the weight of butter, is for the buyer to accept all boxes weighing 56 lb. and over, and to claim on all which are short of 56 lb. Hence, for the buyer, the rule acts on the principle of "Heads I win, and tails you lose." As an extreme case 117 boxes of a certain brand of butter were sold, and the usual 10 per cent. were taken for the "averaging." They weighed as follows:—57, 58, 55, 57½, 57, 57, 56½, 57, 57, 57, 57 lb. each, or a genuine average of 56$\frac{10}{11}$ lb. According to the rule in the provision trade there was 1 lb. short in the eleven boxes, and the buyer was entitled to an allowance of 10 lb. short weight, though he was actually getting 106 lb. of butter overweight. It is needless to say the seller refused to allow any short weight, but he could not enforce payment for the 106 lb. overweight, which was therefore an actual loss to the shipper. What is called taking an "average" is thus seen to be a misnomer, and the present mode ought to be abolished and a genuine "average" take its place. Combined action on the part of agents is all that is necessary, and were there any organisation in existence, such as a butter committee, a reform might be accomplished. The seller is bound by law to supply full weight, and the buyer can have no right to claim more than he purchases. As the sale is made at a certain price per cwt. and not per box or package, payment should be made by the cwt. and fraction thereof. The present system ensures the buyer getting more butter than he pays for, and the shipper therefore loses this amount. This rule offers a strong inducement to shippers to put less than 56 lb. in every box, and so avoid loss of overweight, but, were they to do this, their reputation would suffer, and they would lose in consequence even more than they do now.

Wheat.—The area under cultivation for 1896 was 35,831 acres, an excess over the previous year of 7,741 acres, an increase which, when considered with the steady advance of former years, may be looked upon as an infallible sign of the settlers' faith in the capabilities of the soil and climate for farming, and

also of prosperity. The yield of grain was larger than that of any other colony in Australia, the return being nearly 17 bushels to the acre. Each year brings forth fresh proof of the adaptibility of the Queensland climate for the cultivation of wheat, and to those who understand the conditions under which this crop thrives, there appears little or no reason why, instead of importing some 2,000,000 bushels of grain per annum, we should not before long be exporting in some considerable quantities. There is one advantage which wheat-growers possess over nearly all of the other articles of similar produce: wheat, if given due attention, is not such a perishable commodity as many other products. It can be carried long distances, is always in demand, and commands its value in coin. Hitherto wheat-growing has been confined to the Southern part of Queensland, but interest is now being taken in this connection in the Central district, and this year will show a large increase in the area under cultivation in that district. Several Victorians have settled near Emerald, and have commenced operations upon an extensive style. The fairly large yield of last year favoured the preparation of an increased area for the sowing now being effected, and the late dry spell caused much anxiety, but the light showers which fell during June were very oppurtune, and fortunate was he who had his ground seeded, for though the rain was comparatively light, it was sufficient to give the seed a good start. It may seem to some a hopeless task to sow seed to dry ground at what appears to be the commencement of a drought, nevertheless it is my opinion that it is the proper course to follow. Seed will stand a lot of dry weather if in the ground, but if, on the other hand, the sowing has been delayed until the rains falls, and that time happens to be at the end of the sowing season, and the fall heavy, the ground becomes too wet to sow, and the season is lost. The yield for the coming harvest may reach 700,000 bushels, but if so, it will be far short of our requirements, and leave much room for an increase of area. Many who have pessimistic opinions of farming pursuits here, proclaim that there are already too many people upon the land, but the fact remains that, excepting New Zealand, the average returns are second to none other of the colonies. We have wheat land capable of producing our requirements for many years to come, but we do not produce a quarter of our wants, and are dependent upon outside supplies for breadstuffs. This fact alone is a sufficient justification of the necessity for more settlers to develop our resources, and so keep the large sum of money that is annually sent abroad for wheat and other food supplies. The following table clearly shows the loss that we annually sustain in respect of breadstuff, the figures being based upon the requirements and production for 1896, the quantity in each case having been compiled from the "Statistics" for that year:—

Imports of wheat grain	863,469 bushels,	value	£179,956
Flour (32,996 tons,* 48 bushels to ton)	1,583,808 „	„	370,419
Produced in Queensland	601,254 „	„	† 112,735
	3,048,531 „	„	£663,110

Maize.—The area under this crop continues to advance, the year 1896 showing the highest acreage, 115,715, with the second highest average return during the past ten years—viz., 26½ bushels. These statistics further confirm the favourable opinion I have always held of the adaptability of the Queensland climate and soil for farming—for instance, although the weather of 1896 was favourable for a large return for the early crop in the South, the late early and winter crops were comparatively a failure. The season in the North was, however, much more favourable, a large quantity of maize being produced.

* "Coghlan's Seven Colonies."

† This value has been reckoned at the rate of 3s. 9d. per bushel. The mean population for 1896 is estimated by the Registrar-General as at 466,364 persons. The consumption, therefore, can be roughly estimated as at 6·53 bushels of grain per head. Of the total amount, however, Queensland in 1896 only produced about one-quarter. It must be noted, however, that owing to the drought, import stocks were largely increased in the latter part of 1895.

Again, to show how the farmer here, if he has a failure in one venture, can always have something to fall back upon, it is pointed out that in 1888, the year of our last severe drought, the returns from the wheat crop were only 0·89, or rather more than ¾ bushels per acre, but the maize crop, as if to compensate for the loss on the wheat, returned nearly 25½ bushels per acre. The prices for maize have not been satisfactory to the farmer during the year, but, as another crop can be taken off the maize land, the annual total is not wholly a loss; and when farmers complete the knowledge they are steadily gaining, that the grain and pumpkins are not the only assets to be derived from a maize field, more satisfactory returns will be obtained, and the cattle will be benefited by the provision made for their feed during the winter months, instead of having to exist in the present half-starved condition during that period, that many of them have to experience.

Tobacco.—The area under crop for 1896 was slightly less than that of the previous year, but the return was much higher, the average increase being no less than 1½ cwt. per acre. This increased return would have been very satisfactory, especially to the growers, had the market been favourable, but unfortunately large stocks, for which no price could be obtained, have had to be held over. This year will probably show a decrease in the area under crop over that of 1896, a continued falling off to be attributed, no doubt, to the Excise duty of 1894 by some who forget that as a set-off imported leaf has to bear an impost of 2s. per lb. The cause of the decline is, however, not the Excise duty, but the want of a market occasioned by the still existing prejudice in favour of the imported article. Some three years ago colonial leaf brought a fairly remunerative price to the growers, some of whom, particularly the Asiatic portion, secured big returns; the area under cultivation was increased, and fancy prices were paid as rent for tobacco land, the result being that during this period the advance in area has been fully 100 per cent. Notwithstanding, however, that Queensland manufacturers turn out a really good article, many people retain their prejudice for the imported tobacco, with the consequence that the demand has not equalled the production. The conditions necessary for the production of tobacco fit for export are still wanting, our growers having not yet sufficiently learned the art of curing, grading, stripping, and packing to face an outside market, and to supply these deficencies it will be necessary that educated instruction be available in these branches of the industry. Were this instruction at the service of the growers, a fresh impetus would be given, many of our farmers would find tobacco a more remunerative crop than potatoes or maize, and Europeans would more freely enter upon the cultivation of tobacco, instead of, as at present, leaving it in the hands of the Chinese and other Asiatics.

Sugar.—Reference cannot be made to the sugar season without recording the determined efforts of the Northern planters and farmers to fight the sugar-cane grub (*Lepidiotera squamulata*), which has of late years played such havoc in the fields. Local committees were formed, and a systematic attack made upon the pest, with most satisfactory results. The efforts of the local committees were subsidised to the extent of 17s. 1½d. in the £1 subscribed, this sum being arrived at by a division of the £1,500 made available for the purpose, among the local committees upon the Johnstone and Herbert Rivers, and at Mackay. The season may be described as being a medium one, for though the output is in excess of previous years, it must be remembered that the cultivation of sugar-cane is greater than in former years, induced in every way by the operations of the Sugar Works Guarantee Act, with the consequent larger number of small farmers and co-operative mills, as against the old system of plantations. The Herbert and Johnstone Rivers experienced a good season, but the Burdekin and Mackay districts did not maintain their former records. Under the Sugar Works Guarantee Act, there were seven mills at work, according to information derived from the Department of Public Works—viz., Pleystowe, Marian, and Plane Creek, at Mackay, the Mulgrave at Cairns,

Gin Gin, Mount Bauple, and Nerang River—the output of which for the coming season will be much increased, for some of them were working only for a portion of the 1896 season. The Central Sugar Mills at Mackay, the North Eton and Racecourse continue to make progress, and have paid all liabilities due to the Government up to the present time. The extension of small holdings continues to press upon the State Nurseries for supplies of plant cane, and some difficulty is experienced in meeting the demands made upon the supplies, notwithstanding that the area under cane has been increased, and the resources of the nurseries have been mainly applied in this direction. The following details taken from the *Sugar Journal* concerning the output of different mills may be of interest, but it is regretted that the figures given cannot be quoted in comparison with former years:—"As far as we can ascertain without taking their own sugar, there were 53 mills at work last year. Of these 13 produced less than 500 tons, 7 over 560 and less than 1,000 tons each, 14 over 1,000 and less than 2,000 tons each, and 19 2,000 tons and over. We should point out that several of the factories making under 2,000 tons have a very much larger capacity, and their low output is due chiefly to their only having just started, or to a short supply, owing to temporary unfavourable conditions."

The time is approaching when Queensland sugar will have to find a market in addition to the close preserve of Australia that it has enjoyed so long, and it behoves manufacturers to consider their position in this respect. A probably pleasing addition to the canes that are in cultivation here was received during the year in the shape of seeds that came to hand from the Royal Gardens at Kew, under the name of No. 95 Demerara, and should these seeds after propagation produce cane as valuable as the Kew seedling, the addition will be of great value. An effort was made during the year to obtain some particulars of the origin and value of the cane from which the seeds that produced the Kew seedling were gathered. The inquiry has not resulted in much information, but it may be well to quote the reply of the director of the Royal Gardens upon this point, viz.:—"The history of this important seedling cannot be carried very far. It was raised at Kew from seed obtained from the Botanic Station at Barbadoes. The origin of this is not certainly known. It was probably the Bourbon or Otaheite, but as the seedling can only be regarded as a seminal sport, the parentage of the seed is really immaterial." An analysis of this cane was given in my Report to you for last year under the head of the State Nurseries.

The total output for last year amounted to 100,774 tons, a considerable advance on the previous year; and notwithstanding the additional acreage under crop in connection with the new Central Mills, it is very questionable whether the output will be as large in this year's harvesting. The long protracted dry weather in all the sugar-growing districts kept the cane back, so that there will be a shortage of crushing material, consequently a smaller turn out of sugar.

SUGAR STATISTICS. (FROM THE REGISTRAR-GENERAL'S RETURNS.)

Year.	Area of Sugar-cane Crushed.	Sugar Manufactured.	Average Produce per Acre.	Molasses Manufactured.	Distilleries Working.	Spirits Distilled.
	Acres.	Tons.	Tons.	Gallons.		Proof Gallons.
1894	49,839	91,712	1·84	956,276	6	102,679
1895	55,771	86,255	1·54	1,730,591	5	111,034
1896	66,640	100,744	1·51	2,195,470	5	105,826

Sugar mills working in 1894 *	... ...	62
" " 1895 †	... ...	86
" " 1896 *	... ...	81

* Mills for crushing cane only excluded.

† Composed of 61 mills that made sugar (including Yengarie and Milaquin), 1 refinery proper at Brisbane, and 24 mills that crushed only.

EXPORTS.

	1894. Quantity.	1895. Quantity.	1896. Quantity.	1894. Value.	1895. Value.	1896. Value.
	Tons.	Tons.	Tons.	£	£	£
White	16,001	16,320	17,372	287,472	257,178	271,084
Yellow	4,244	3,354	2,849	62,321	41,959	33,519
Ration	44,920	47,532	55,154	540,429	496,980	558,477
Totals	65,165	67,206	75,375	890,222	796,117	863,080

SWEET POTATOES.—For some time complaints have been made that although no disease is apparent, the vines fail to yield tubers. This can, I think, be attributed to the common custom of continuously planting the same piece of ground and raising potatoes from vines, instead of obtaining a change of roots and growing the crop upon fresh ground from young shoots. The present system is altogether wrong, and has a tendency to weaken the constitution of the plant, to which the barrenness complained of can without doubt be attributed. Notwithstanding that the deterioration of plants from constant artificial propagation has long ago been proved, this same system is still in operation, with the result that many of our best varieties of fruit are rapidly disappearing, and so with other forms of plant life with which this system is followed.

Among the most notable examples of this method of destructive cultivation, the disease that lately attacked our pineapples can be quoted. Many causes, such as the kinds of manure used, want of drainage, &c., &c., were attributed to this disease, the real nature of which, in my opinion, was nothing more or less than a disease borne of the constant propagation by suckers, instead of propagation from seed, as has been so successfully carried out by Mr. Soutter, of the Acclimatisation Society. Now we hear that the sweet potato is in some districts fast approaching the vanishing point, due, to my mind, to the pernicious system before stated. I have often given advice with regard to the true system of propagation, a system practised by me for years, and therefore no theory. The method I advocate is that about the end of July or the beginning of August a few fairly large potatoes of good variety should be planted, and covered with not more than 2 inches of soil. These will throw up many young shoots, and when these shoots are about 6 inches above the ground the potatoes should be lifted, and the eyes from which the young shoots spring should be carefully cut out with a sharp knife. The eye with the young shoot should then be planted in ground slightly ridged, and if the season be at all a favourable one, potatoes of good quality will be ready for lifting at least a month earlier than by the system of planting from a piece of the vine, as is now the custom, and the plants will be constitutionally stronger.

EXPORT OF PINEAPPLES AND MANGOES.—During the past year two shipments of pineapples have been made within the knowledge of this Department, and one of mangoes. With regard to pineapples, the first was from Cairns, per ss. "Banffshire," leaving in November, 1896; the second, from Brisbane, by the ss. "Jumna," in February last. The first shipment was a private experiment; and, from the report of Messrs. McIlwraith, McEacharn, and Co., a successful one, for the fruit arrived in excellent condition. The fruit, however, was too small for the London market, and realised but a low price. It would be well were exporters to think of the competition to be met with in the London market, and hesitate before they send any but the best of their merchandise,

for the inferior article is sure to be sacrificed; but the best, unless in the hands of unprincipled traders, will always command fair value in a market that draws its supplies from every quarter of the globe. The excellent condition in which this shipment reached London, and the success of the experimental shipment to Canada by the ss. "Miowera," is, it is thought, sufficient evidence that pineapples, when cut in proper condition, and with proper care upon the voyage, can be transported to London, and laid down fit for consumption. Whether they can be profitably placed upon the London market is, it is assumed, a matter for the merchants to determine. The shipment of pineapples and mangoes by the "Jumna" was not a success—the pines being a total failure, the mangoes partially so. It was with much surprise that I learned of the failure of the pines, for, with the result of the Canadian experiment as a guide, it was thought that the pines would without doubt arrive at their destination in good condition. With the mangoes the case was different, for it was a new experiment with fruit delicate when ripe; and yet they arrived in a sufficiently good condition to enable those to whom the cases were consigned to recognise the excellency of the Queensland flavour, and to criticise accordingly. These mangoes were from the gardens of Mr. Gulliver, of Townsville, who picked and packed them, and had to ship them under adverse circumstances. The following reports have already appeared in the Press, but as they have a special interest to those engaged in the fruit industry here, but who may not have seen them in the newspapers, they are here included. Upon the return of the "Jumna" it is hoped that the Chief Engineer, under whose special care this shipment was placed, and to whom a case of pines and of mangoes was given for observation, may be able to give some interesting information as to the state of the fruit at the different ports. Such information, the result of observation, is often of a beneficial nature, and may be of great value in case further experiments are made.

Monument Buildings, Monument Square,
London, E.C., 6th April, 1897.

DEAR SIR,

16 CASES PINEAPPLES EX "JUMNA."

PINES.—Dead green; apparently the same as when shipped; a few mouldy; all showing signs of the cold air in which they had been carried; quite unfit for sale or sending away, the fruit having lost all aroma and flavour; more or less fermented, and, when cut, they were like some soddened, hard, green vegetables (turnips).

We are of opinion that such juicy fruits as pineapples, mangoes, or any other of a moist nature are quite unfit for a long voyage, especially in a cold chamber.

The packing in our opinion is wrong. We advocate the system as carried out in St. Michael's (Azores)—viz., in flat boxes; one layer of pines laid lengthways; 8 to 10 pines in box according to size, and well and tightly packed in thoroughly dry maize leaves, free from cornstalks. We fear there is not any opening for them commercially on this side, as our market is well supplied from St. Michael's, and when these are plentiful prices are low. In comparison, had the Queensland pines arrived in sound condition and well-coloured, their value would have been—

For small from 6d. to 9d. each.
„ large „ 1s. to 1s. 6d. each.

Many of the Queensland pines had double, treble, and in some instances four crowns. Such are much disliked here, where single crowns are preferred.

St. Michael pineapples, from whence the voyage is only from seven to nine days, are generally very fine; and their season lasts from early November to July, sometimes August, some steamers bringing from 10,000 to 15,000 at a time.

Avoid all straw in packing fruit, also do not use wood shavings.

Carrying by cold chamber is *not* suitable for pines, and the voyage is too long for them to be carried as ordinary cargo.

We remain, &c.,
KEELING AND HUNT.

Chas. S. Dicken, Esq., Acting Agent-General for Queensland.

Monument Buildings, Monument Square,
London, E.C., 6th April, 1897.

18 CASES MANGOES PER "JUMNA."
Landed and inspected 5th April, 1897.

DEAR SIR,—The three private cases and five others have been forwarded as previously advised. Three—viz., for the Queen, Lord Jersey, and the Right Hon. J. Chamberlain—were repacked; the others were sent as landed.

CONDITION.—The three private cases and four others were in fair condition. The others we can but describe as bad, the total result showing about 50 per cent. bad; some of the others were green and spotty, while a few were ripe. Such fruit is of too tender and juicy a nature to stand a voyage in the cold chamber, and the voyage is too long for it to be carried as ordinary cargo.

PACKING.—We cannot at the moment suggest any improvement; it appeared to be satisfactory.

MANGOES.—Are practically unknown to the British public, and would not, we fear, find much favour when such fruits as oranges and apples are so cheap and plentiful as they have now been for some time. We cannot recommend the shipment of mangoes to this country from a commercial point of view; the few we have hitherto received having in every instance left the shippers a loss. The fruit is only known to and appreciated by those who have lived in the tropics.

We have, &c.,
KEELING AND HUNT,
Per F. Knott.

Chas. S. Dicken, Esq., Acting Agent-General for Queensland.

London, 6th April, 1897.

SIR,—I do myself the honour of presenting my report on fifteen cases of rough-leaf pines and one case of smooth-leaf ditto, forwarded to you by the Agricultural Department of Queensland as a trial shipment ex "Jumna."

In compliance with your request and by your appointment, I called at the warehouse of Messrs. Keeling and Hunt, and saw the cases unopened. The packages arrived in splendid condition, and had been carefully handled by the shipping company.

The packing of the fruit was all that could be desired. After removing the lids from the cases, the green top on the pine was as fresh as if it had been only one week from the garden.

I made a separate survey of the smooth-leaf variety first, and regret to report that I did not find the apple in the good condition I expected. It was a dark-green, without a tinge of yellow colour, not even a speck, and was very *cold*. I pressed it and found the apple quite hard, but it was covered with a rusty-looking mould. Doubtless the cold process had drawn the juice to the surface, which would furnish a reason for that condition.

When cut open, I found the fruit was white, hard, and dry, which had the same appearance as a half-grown pine, but the tasting was the most disappointing part of my duty. The flavour of the pine was not there; in its place I found a flat, acid, and musty taste, unwholesome and not fit for consumption.

ROUGH-LEAF PINES.—This sample differed from the smooth-leaf in appearance (so far as the fruit part of the apple); the surface was clean and clear of mould. I found when pressed it was spongy, when cut it was pulpy, and, unlike the smooth-leaf, had about the normal quantity of juice, but it had the flavour of vinegar. In this pine, fermentation had set in, and it, too, was unfit for use.

SEALED ENDS.—I carefully examined the samples in the stalk end closed by sealing wax, but failed to find the condition of the lot any better than the open ones.

In summing up the result of my survey, I find that the cold chamber is fatal to the pine, its effect being—

1. To land the fruit in the green state in which it is gathered.
2. The chill prevents the development of the saccharine in the ripening stage.
3. It changes the juice into an acid which results in fermentation.

REMARKS.—The trade here favour only the sample with the single top. The double and treble crest do not sell so well; exception is also taken to the nasty excrescence on the lower part of the pine (some of them).

SUGGESTION.—If another shipment follows I would respectfully advise—

1. That all pines gathered for this trade should be full grown, with a tinge of yellow upon them.

2. That, if possible, the fruit should not be subjected to a temperature lower than 50 degrees.

MANGOES.—I also examined cases of this fruit, and found only one sample had carried well—the flat kidney shape, a bright-yellow. I did not perceive that the cool chamber had affected the flavour, or had in any way damaged it, and think it a much safer article of export if that variety is shipped, but it would be risky to advise shipment on a large scale, as the taste is not acquired; and unless some special agent were here to receive the fruit to repack and repaper (as the effect of the process causes the fruit to exude a moisture and the paper is wet), and to push it as a special line, I fear it would go into the hands of the large agents, only to be slaughtered, as one of the largest firms have received a consignment from India which did not find buyers.

In presenting this Report to you, Sir, for your Government, who are so nobly trying to develop the products of a fine colony, it would have given me great pleasure if I could have reported the complete success of the experiment.

I am, &c.,

WILLIAM H. KNOWLES.

The Agent-General for Queensland.

(*Queenslander*, 12*th June*, 1897.)

The following is an extract from a letter received by Mr. Thynne from Lord Jersey, Middleton Park, England, relative to a case of mangoes sent to him by the "Jumna":—"I am writing to thank you for your kind thought in sending me the nice present of mangoes. The pineapples, I understand, did not stand the voyage well, but the mangoes were decidedly good. I was away when they first arrived, but Lady Jersey tells me that she and the family liked them. I had my first one to-day on my return, and can speak to its excellence. We made some jelly out of some of the others, which proves to be quite a success. Though they have not got the colour of Bombay mangoes, yet I think that, after some experience, shippers will be able to place them on the market here with every prospect of their being liked. I remember having some Queensland mangoes once or twice when I was in Australia, but they were nothing like so good as these."

The Department is in receipt of the following letter from the Acting Agent-General:—"In continuation of my letter of the 9th instant, 275-97, concerning the shipment per steamer 'Jumna' of pineapples, mangoes, honey, and butter, I have the honour to enclose herewith, for the information of the Secretary for Agriculture, a letter received at the Colonial Office from Sir Arthur Bigge as to the condition in which the mangoes for the Queen arrived, and also copies of letters from the Private Secretary to Mr. Chamberlain, Lord Jersey, and Mr. Edgar A. Scriven, all of whom report that the fruit reached them in fairly good condition. Having ascertained the names of the firms to whom the butter was consigned, I asked them to be good enough to furnish me with all the information possible with regard to the shipment, and I now forward herewith copies of their replies, which appear to me to be very satisfactory.—I have &c., CHAS. S. DICKEN."

Mr. Bigge's letter is as follows:—"The Queensland mangoes arrived here yesterday afternoon in excellent condition, and many of them have already been eaten with much satisfaction. The Queen desires that the Agent-General for Queensland may be asked to express Her Majesty's thanks for the fruit, and that his Government may be informed in what a good state it was received at the end of so long a journey."

The secretary to the Secretary of State for the Colonies writes to Mr. Dicken as follows: "Dear Mr. Dicken,—Mr. Chamberlain desires me to thank you for kindly forwarding him the bin of mangoes from Queensland, and begs that you will express his acknowledgment for the present to the Agricultural Department of the colony, and to say that the fruit reached him in excellent condition, and is of the best quality."

Lord Jersey writes to Mr. Dicken concerning the mangoes sent to him, in the following terms: "Dear Mr. Dicken,—I have only returned to-day from a long tour of inquiries in Scotland, or else I would have acknowledged before the receipt of the mangoes. They came in very fair condition, and I have eaten one to-day which is

very good. I have no doubt but that after a little experience the fruit can be placed in a satisfactory condition on the market. I found that they had made some jelly out of the mangoes, and this is excellent. I will write to the Minister for Agriculture."

Mr. E. Scriven, of Stratford-on-Avon, writing to Mr. Dicken, says:—"Dear Sir,—I sent you a local paper to-day containing a notice of the mangoes. The report therein was the editor's own compiling, as I simply took him the mangoes and explained to him the nature of the fruit, &c. Had they all turned out the same as the ones he had, they would have done very well. The case reached me on the 6th instant, and arrived in splendid condition. Out of the whole lot I only had to throw away two as being rotten. All the papers and the fruit were soaking wet. I unpacked them on the morning of the 7th, and laid them all out carefully and left them to thaw. I certainly think the experiment may be voted a partial success. The difficulty I can see will be to know at what time the fruit ought to be picked. There were a few in the case that became quite soft and ripe as soon as they had thawed. I distributed these amongst the principal inhabitants here, and all who had any liked them very much. One of the large yellowish ones that I had myself was perfectly ripe, and in my opinion retained all its original flavour. My wife also was of the same opinion. A few more have ripened since, but these certainly had lost a good deal of their flavour, and had a dried-up taste. I sent some of the partially ripe ones to Sir Arthur Hodgson, General Manderson, and many old Australian and Indian friends, who know what a mango should be like, and the verdict of them all is that the fruit would not ripen properly, and what did appear to be ripe had little of the original flavour. I have still some left that do not seem as if they would ripen at all. I think the experiment will be well worth another trial, as, from what I can learn, the mango that is known to the Londoner is of the common green sort and is full of fibre; and if we can land the Queensland fruit in a ripe condition, it certainly ought to cut out the coarser kind. Of course there are mangoes and mangoes, and care will have to be taken to send only the best kinds. I do not remember enough about them to give the mangoes their correct names, but the large yellowish ones seemed to arrive in the best condition; and the only way to succeed will be to pick the fruit ripe, or very nearly so, and if they could be landed here and placed on the market in a ripe condition, and only the best sorts sent, I don't see why a good trade should not be done, and they would, I should say, easily fetch 4d. to 6d. each, according to size. I gave a few of the best to the local fruiterer here, and he sold them at the latter price. I am extremely obliged to you for forwarding me the case."

Canning Pineapples and other Fruits.—In former reports I have referred to the markets which it is thought could be found in the United Kingdom and on the Continent for Queensland fruits, and more particularly for pineapples, that could be preserved, if presented to the buyer in an attractive form. In furtherance of this presumption the following report, received through the Agent-General from Mr. R. A. McCallum, of St. Mary Axe, London, E.C., together with an estimate of the cost of the installation of a factory for the purpose, should be of interest. Samples of the tins referred to in the report are on view at this office for the benefit of those who may care to inspect the same:—

St. Mary's Chambers, 14 St. Mary Axe,
London, E.C., 11th November, 1896.

REPORT ON TINNED FRUITS.

Pineapples (whole).—This is an article for which there is a very large demand in England. The supplies come almost entirely from Singapore.

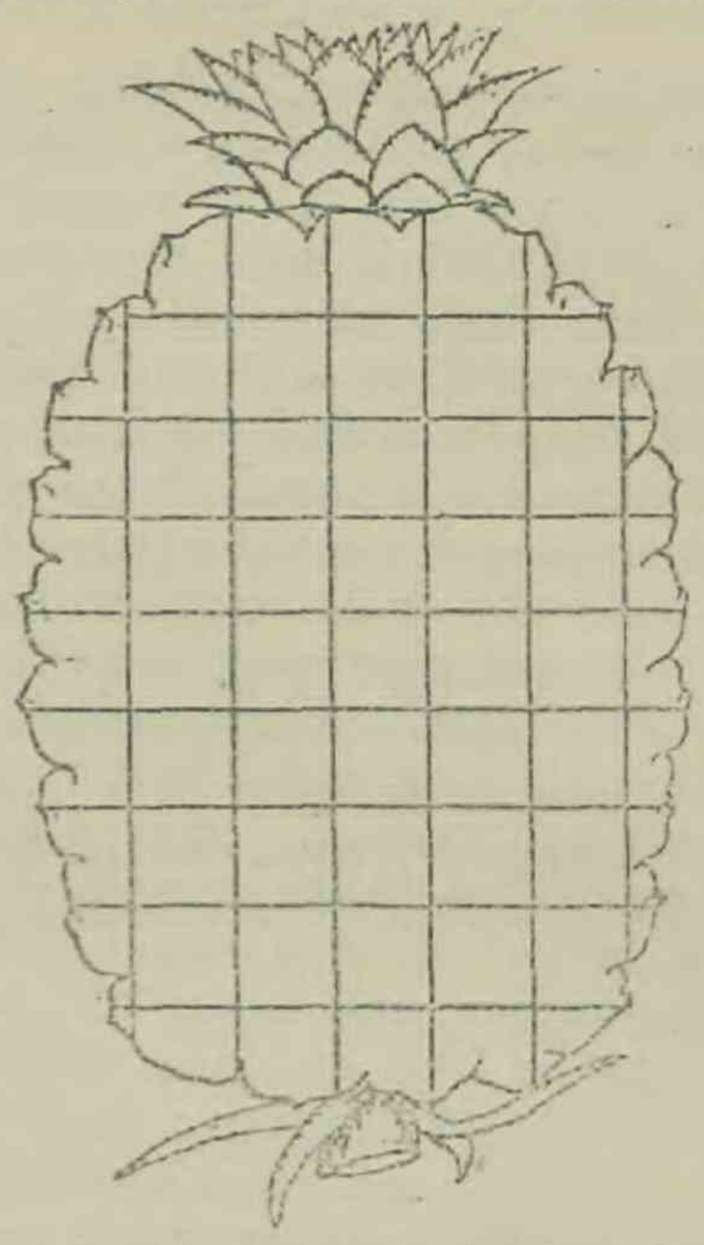
This industry of tinned pines was commenced about 1850, by the firm of Bastiani and Co., of Singapore. At that time the trade was a comparatively small one, and the prices realised on this market were very high—viz., about 15s. per doxen 3-lb. tins. During the last ten years Bastiani and Co. have had many competitors, principally Chinese, and the prices on this market have gradually come down, until now tinned pines can be bought from importers at the following figures—

1's, 1¼'s, 1½'s, 1¾'s, 2's, 2¼'s, 2½'s, 2¾'s, 3's, 3½'s.

2s. 9d. per dozen, up to 5s. 6d. and 6s. 6d.

The packers make tins for the different sizes of pines, from 1 lb. to 3½ lb., so that they can make use of all the sizes of fruit. They are of course graded afterwards, and put in separate cases according to the weight.

Chunks.—The packers in Singapore, during the last year or two, have introduced a new form of packing pineapples, in the shape of what they call "chunks." The pineapple, before being put into the tin, is cut down in sections, and again cut across, thus—



In this way the pineapple, after the tin is opened, is more easily served at table. These fetch a higher price than the others, and are gradually taking the place of the whole pines. There is no use packing these chunks, however, smaller than 2½ lb. The prices of these run as follows:—2½'s, 5s. 6d. to 6s.; 3½'s, 7s. to 7s. 6d.

These low prices of course have the effect of popularising the fruit very much, and the result is there is almost an unlimited demand, not only in England, but all over the Continent.

For continental use the pineapples come without syrup, or, as it is called, "au naturel." For the English market, only pineapples in syrup are taken.

Other Tinned Fruits.—As regards other tinned fruits, their popularity on this market is on the following scale:—1, pears; 2, apricots; 3, peaches; 4, greengages; 5, cherries.

Pears.—This fruit is very much sought after here, and the good quality comes almost entirely from California. This is the fruit most in demand, and good Californian pears are worth at present 14s. per dozen. They are scarce this year, but in a normal year they are always worth from 10s. to 12s. They come here like all the other fruits, in 3-lb. tins, and are packed in cases of twenty-four tins each. The fruit is put into the tins in halves, having previously been cored. The great point in the preparation of these is the colour. The Californians, before packing the pears, treat them by some process in order to bleach them.

Apricots.—There is also a good demand for this fruit, both whole and in halves. Prices run, for 3-lb. tins, from 6s. up to 9s., according to quality.

A large trade is also done in this country in apricot pulp. This is packed in 5 kilo tins (ten tins to the case). The preparation is very simple—viz.: The fruit is cut in halves, the stones removed, and then the halves are put into the tin. No sugar or other matter is added. The tins are of course processed in exactly the same way as for the fruit.

Peaches.—There is also a good demand for this fruit, the finer kind being what is called the "Lemon Cling," where the stone clings to the peach. Prices of these range from 6s. to 10s., according to quality.

Cherries.—There is only a moderate demand for these. Prices are from 7s. to 9s.

Quinces.—Small lots of quinces have come to this market, but they have always been slaughtered. There is practically no demand for this article.

Samples.—I send you along with this report samples of the following:—

			Importers' Price.
Pineapples, whole	1 tin ...	6 6	per dozen
„ chunks	2 tins ...	9 0	„
Pears	2 „ ...	14 0	„
Apricots, whole	2 „ ...	9 0	„
„ halves	2 „ ...	7 6	„
Apricot Pulp	1 tin ...	18 0	per 10 tins
Peaches	2 tins ...	9 6	per dozen
Greengages	2 „ ...	9 0	„
Cherries (Morella)	2 „ ...	9 0	„

Estimate.—I enclose an estimate, made out by an expert, for the plant of a factory capable of producing 20,000 3-lb. tins of pineapples or other fruits in a season. This estimate is of course exclusive of all buildings. It amounts to 15,700 francs, or £628 sterling. I send the original and a translation. This estimate includes all the machinery for making the tins on the "sertie" or stamping. If the tins were soldered, the expense for plant would be considerably less, although not so effective, and the tins would cost more.

REPORT ON CITRON, ORANGES, AND LEMONS, IN BRINE.

All the manufacturers of orange, lemon, and citron peel buy their fruit in brine.

Citron.—This comes from Corsica and the coast of Morocco. The most esteemed comes from Corsica. It is shipped to this market in casks containing 8 to 10 cwt. of fruit. The fruit is simply cut in halves, put into the casks, and, when full, brine is poured in of a strength sufficient to float an egg. The present value on this market is 20s. to 22s. per cwt. of fruit. They are cheap at present. The prices in a normal year would be about 25s.

Oranges and Lemons.—These come from Madeira and Messina in pipes of 6 to 7 cwt. of fruit. They are prepared in exactly the same way as the citrons. The market for these is very quiet at present. Prices are from 17s. to 18s. In a normal season the prices would be 20s. to 21s. per cwt. of fruit.

ESTIMATE FOR THE INSTALLATION OF A FACTORY CAPABLE OF PRODUCING 20,000 TINS OF PINEAPPLES OR OTHER FRUITS IN A SEASON.

	£
1 Steam boiler, 4 Atm	120
1 Steam engine, 5-horse power	80
2 Autoclave boilers of a capacity of 400 tins 4/4's	48
4 Iron gratings for holding the tins in the autoclave boilers ...	16
1 Crane for hoisting the gratings when full	12
3 Deep wide copper pans for blanching the fruits and for preparing the syrup, capacity, say, 44 gallons each	72
1 Iron vat, capacity 2,000 litres, for water in which to soak the fruits after they have been blanched	8
1 Pair of shears with blades 1 metre in length	10
1 Machine for cutting the bodies of the tins	40
1 Stamp for the tins	8
1 Machine for rolling the bodies of the tins	6
1 Machine for bevelling simultaneously the two ends of the tins ...	28
1 Press for punching and fixing the bottoms and lids of the tins ...	20
1 Press for fixing the bottoms	20
1 Stamp for cutting and bevelling the bottoms of tins	8
1 Stamp for bevelling the bottoms of the tins	8
1 Closing machine	36
4 Mandrils for soldering the bottoms	4
2 Discs for the closing machine...	2
1 Apparatus for fixing the indiarubber threads on the bottoms of the tins	20
2 Discs for same	2
Tools for soldering	20
Transmission for setting in motion the closing machine, the machine for punching the bodies of the tins, and the machines for bevelling and rolling	20
Pipes for gas for the machine for fixing the threads on the bottoms of the tins and for the soldering	8
Steam piping for the copper pans and autoclaves	8
Water piping for the pans, &c.	4
Total	£628

Co-operative Wholesale Society.—The delegates of this vast co-operation, Messrs. Jones, Clay, and Stoker, who visited Australia last year in connection with their mission to inquire into fresh sources of trade, came to Queensland at the invitation of the Government. The delegates arrived here during the last days of August, but were able to spend only a few days here, and so were prevented from visiting parts of the colony they had hoped to see, and from investigating some of our manufactures that it had been their inten-

tion to inquire into. However, the short time available was utilised in showing the delegates the industries that are within reach of Brisbane, and the tropical and temperate branches of agriculture that can be visited from the same starting-point. The visitors were shown the works of the Colonial Sugar Refining Company at New Farm, the meat works at Eagle Farm and Queensport —typical of two branches of this trade, freezing and canning—the bacon factory at Zillmere, the tanneries around Brisbane; and with regard to agriculture, were taken to see the pineapple fields around Nundah, the sugar-cane farms of the Isis Scrub, and the farming and dairying centres of the Downs. Notwithstanding the tax that was placed upon the energies of the visitors in hurrying from one place to another, they found time to address a public meeting in the Centennial Hall upon co-operation, out of which a co-operative society has come into existence in Brisbane, and is now in operation. Another public meeting was addressed by the delegates at Warwick when on their way to Sydney. Whatever may be the commercial results of the visit of the delegates, it is certain that they gave information, while here, which Queenslanders would do well to follow—information which was based upon facts arising from the experience gained by a society which thirty years ago started with a capital of £999, and, in the words of Mr. Jones, now had so much capital that they did not know what to do with it, and had to invest a couple of millions sterling in consols and municipal securities.

Cotton.—The area under cotton was much less last year than in former years, and the unfortunate position of the Cotton Company at Ipswich will, it is feared, cause a complete collapse of the industry. Cotton-growing has never been in a flourishing condition since the withdrawal of the bonus, though a few farmers managed to secure fair returns after the factory was started. The price of cotton in the English market will not permit an export trade being established here, and with the cessation of a local market the production will cease.

Coffee.—Considerable activity has been displayed in the formation and cultivation of plantations, notably at Cairns and Mackay. In the latter district an additional 20 acres has been planted, and two plantations of 25 and 30 acres each have lately been formed. The suitability of the Cairns district is fully exemplified by the admirable display of the beans in parchment, and the prepared article now to be seen in the Court of the Cairns Chamber of Commerce at the International Exhibition. The applications for young plants and for seed from the nurseries have been many, and inquiries have been received from England and India for information concerning land that is suitable for coffee-growing. Judges who have tasted the Cairns coffee pronounce it to be an article fit for any market, and judgments such as these open up great fields of industry, for with coffee alone there is a great demand. We have the land to grow it upon, the climate that suits it, and are free from the leaf disease that has destroyed the industry in Ceylon and elsewhere.

Canaigre.—Attention has before been drawn to this tanning plant, which was obtained with much trouble and propagated at St. Helena. The demand for tanning material is enormous; supplies are sought all over the world, and there is no fear that the supply will be greater than the demand, but there is a fear that the demand will exceed the supply. In canaigre we have a valuable tanning plant that is easily raised. It is grown like potatoes, 30 inches apart, and from 9 to 12 inches in the row. Unlike the potato, the tuber is not lost in harvesting, but is gathered with the crop, and is richer in tannic acid than when planted. The ground should be cultivated sufficiently to keep the weeds down, and the soil free and loose until the leaves cover the ground. The crop should be gathered in the same manner as potatoes are harvested, and will yield from 8 to 10 tons to the acre. Canaigre is very tenacious, and will keep for a long time under almost any conditions. It is stated that tanners can use the roots green, but it is thought to be preferable to chip them, or to shred and dry the roots, or by making an extract of them. Skins can be tanned in half the time by using canaigre that is generally taken by using oak bark.

It may be that some time Queenslanders will find out that there is more money in tanning the hides and exporting the leather than in exporting the raw hides, and for such a purpose the cultivation of canaigre would become profitable. The analysis of canaigre as made at the Royal Gardens, Kew, is—

Tannin	37·48
Organic matter	11·20
Water	12·07
Ash	0·20
Woody fibre	39·05
	100·00

Cocoanut Plantations.—The cutter "Lizzie Jardine" has been kept constantly at work during the past year, the principal work performed being transplanting and attending to existing plantations upon the islands. At Kennedy Sound, all the young palms have been transplanted, and a large plantation formed there. The palms in general are doing well, but were affected by the drought which was prevalent upon the islands as well as the main land, and some of the trees which are now six years old were expected to blossom, but did not do so. It has only been by constant attention that the palms have been kept moving at all. Captain Griffith still complains of the loss occasioned by fire, the principal offenders being people who visit the islands, and who by accident or design set fire to the grass, so that unless the young palms are kept clean and the grass for some distance round is cut down, the loss is serious. Isolated as the islands are, it is difficult to keep a proper control or to secure a conviction for malicious acts, and the only thing to do is to keep the blanks filled, so that when the stronger plants grow to a sufficient height and form a shade, the danger is lessened. Another source of loss arises from the depredations of the natives who visit the islands, for not only do they cause fires, but also remove the young plants in the hope of finding the nuts. This danger is, however, now somewhat counteracted by the formation of nurseries, and removing the young plants later to their final destination, and when they come to understand that the nut has disappeared from the plant, the danger from this source will disappear.

Barley.—The cultivation of this cereal has fluctuated considerably during the past ten years. In 1888 there were 324 acres under crop; in 1894, some 1,418 acres; in 1895 the area dropped to about one-half of that in 1894; and in 1896 the area seeded covered 1,122 acres, for which latter increase the establishment of the malting establishments at Toowoomba and Warwick are no doubt responsible. The markets now established here, with the aid of the import duty, should induce and increase the production of malting barley upon the Downs, the climate and soil of which have been pronounced to be eminently adapted to this grain.

Honey.—Whether it be prejudice on the part of the British consumer, whether the merchants there consider it to be to their interest to cry down Queensland honey, or whether the flavour does not suit the English taste, the fact remains that Australian honey is not in favour with the public in the United Kingdom. Advantage was taken by Mr. Chambers, of Laidley, to send home some comb honey in the cold chambers of the "Jumna," the honey being made up in neat boxes containing 1 lb. sections, to ascertain in the first place whether comb honey could be carried to England, and secondly, to test the market and find out whether it would meet with more favour than the extracted honey. The consignment carried safely, and was placed by the Agent-General with Messrs. Devitt and Hett, brokers, for sale. The highest bid was, however, only 40s. per cwt., which was considered a low price, and the flavour was thought to be inferior to that of English honey. The bid was not accepted, and the honey was afterwards sold at 5d. per lb., considered to be a fair price for a small quantity. The agents write that perhaps a slightly higher price might be secured for a larger quantity, but that there was no hope of competing

with English comb honey. The price obtained cannot be considered at all satisfactory to the shipper, for apart from the low price obtained, from which in the ordinary course of business freight and charges would have to be deducted, there is much risk in shipping comb honey, because a little careless handling would spoil the whole lot, consequently a good margin of profit is a necessity.

RUBBER.—The great demand for this product in Europe, and the great increase in the price obtainable for it, which is at present about £400 per ton for approved rubber, is in a great measure, no doubt, the cause of the many inquiries that have lately been made here for plants and for land wherein to grow them. There are many thousands of acres in the North of Queensland suitable for the cultivation of rubber, but it behoves those who are preparing to establish plantations and take advantage of the present demand to grow only the best varieties, those that command the highest price, and not to consider that because one or another of the family yield rubber, that the product is good enough to place upon the market, for it is not so. Again, the rubber planters who understand their business, tap their trees when at a mature age, so securing an annual supply, and do not cut down the trees to obtain the rubber, as is the case of some countries where rubber is indigenous. Search is now being prosecuted from Europe into every likely quarter of the globe for a supply of the raw material, and unless an artificial substitute is found, which does not at present appear likely, there is every probability of rubber maintaining its value, so that there is a profitable prospect before those who may invest capital here in this direction. A plantation was some years ago established at Mourilyan Harbour by Messrs. Seymour and Allan, and would now have been in profitable bearing but for a tornado which swept the place and destroyed all before it. The young timber of the rubber tree is very brittle, but if, in clearing scrub for the formation of a plantation, sufficient care is taken to retain wind-breaks, the danger arising from heavy winds need not be feared. Some two years ago, seeds of the Para and Ceara rubbers, the varieties now most thought of, were introduced at the State Nursery, Kamerunga; and Mr. Cowley brought back from New Guinea some cuttings of the *Ficus elastica* for the same place, all of which are doing well. The rubber tree is readily propagated from cuttings, and a number will shortly be available. A further supply of seed has been ordered.

FRASER'S ISLAND NURSERY.—The plantations, roads, and lands have been kept clean during the year, and nearly 7,000 young plants have been set out and attended to. Reafforestation is at all times a slow process, and does not give the immediate results that are looked for by people who do not understand, and specially so is this the case with young trees. One is apt to forget that the existing forests grew up simultaneously, the strong crushing out the weak, but in reafforesting an old scrub, the young trees that have been planted in lanes or along old timber tracks lack the air, heat, and sunshine that plants of an equal age and growing together obtain, thus constant attention and watchfulness are necessary to obtain the best results in reafforestation. It has now been decided that a change shall be made in the work at this nursery. The operations are now to be carried out by the aborigines residing upon that part of Fraser's Island under the control of the Hon. the Home Secretary, a reserve having been proclaimed for that purpose. To a certain extent the future system will be a continuation of the past, the difference being that the person in charge of the aborigines will have the direct control of the work, instead of the nurseryman lately employed, Mr. A. Mitchell, who now severs his connection with this Department, but who during the period that he has been so employed has always carried out his work faithfully and well. While upon the subject of reafforestation, it is hoped that before long some steps may be taken to secure protection to our existing forests, and prevent the wholesale destruction that is now going on. It is submitted as a general scheme that timber-getters should be prohibited from felling timber at their will, and at seasons of the year when the best results cannot be obtained from

the timber thus practically destroyed, and that a system of reafforestation should be brought into action, a system involving not so much the establishment of nurseries, with the consequent transplanting, which is expensive, but rather the protection of the young self-sown plants which are to be found in such numbers in our scrubs that have been attacked by timber-getters.

AGENT-GENERAL.—The help received from the Agent-General's office has been of great value, and the interest taken by Mr. Dicken, when acting as Agent-General, in prosecuting the many inquiries that have been presented, have been of benefit to those farmers on whose behalf the inquiries were made. The inquiries have covered much ground, and comprised, among many others, beekeeping, agricultural education in the United Kingdom, attempts to foist inferior seed upon the colonial markets, Swedish method of preparing milk, sales of Australian fruits, sale of arrowroot under the Food and Drugs Act, display of Queensland products at British agricultural shows, export of butter, fruit, &c., from Queensland, olive cultivation, &c., &c.

FRUIT MODELS.—An interesting addition to the exhibits in this Museum is the fine collection of models of fruit produced here. The collection is by no means yet complete, there being so many different kinds of fruit that are or can be grown within the borders of Queensland, fruit varying from the apple of the temperate climate to the kola-nut of the equator. At present all the models have been made from fruit grown in the South, but it is hoped that, in the coming season, models will be made from fruit in the North, particularly from the English fruits that are grown in the neighbourhood of Herberton. Nearly 200 models were made and forwarded to England for the use of the Immigration Agents, and will be a practical means of introducing to possible immigrants the nature of the fruits that can be cultivated here. The models have all been made by Mr. Alder, of George street, and reflect great credit upon him.

STATE NURSERIES.—These institutions continue to attract the attention of the farmers in the districts in which they are established, and, in the absence of fully equipped sugar experiment stations, have been of service to sugar-cane growers. Much attention is still being paid to the cultivation of new varieties, a work that few private persons care to engage in, and which is liable to be somewhat misunderstood, the impression being held by some that varieties are being propagated and distributed before their sugar-producing virtue has been verified. This, however, is not the case, because no cane is to be distributed until its value has been thoroughly tested by analysis. It is to remove this impression, which it is understood exists, that reference has been here made to this matter. Over fifty varieties, that were last year obtained by Mr. Tryon from New Guinea, are being cultivated, but none will be available for distribution until their value is known.

The cane that is known by the name of Kewensis, and which was received as a seedling from the Royal Gardens at Kew, is a great favourite with sugar-cane growers, is giving indications of becoming a most valuable cane, and is a strong stooling cane. It stands high on the list in the laboratory, which, as it is a new cane with its history to come in the future, is strongly in its favour. Mr. Buchanan, of Mackay, writes highly in favour of the last lot from New Guinea, and if only two or three turn out to be a success, their value to the sugar-grower will more than compensate for the cost of obtaining the whole. To show the difference in the demand at the nurseries, over 110 tons were applied for at Mackay during the year, and only $4\frac{1}{2}$ tons at Kamerunga; but the establishment of the Central Mills in the Cairns district will, it is assumed, create a demand for cane plants during next planting season, and equalise the distributions. Though Mackay now leads with sugar, Kamerunga is more in favour for tropical fruits, some 1,305 lb. of coffee seed and 2,250 plants having been given away from the latter place during the year. This distribution will tend to show the interest that is now being taken in coffee cultivation in the North. Reports from the overseers of each nursery are appended hereto.

Flying Foxes.—Last year, as in former years, the fruitgrowers lost heavily from the depredations of the foxes. To meet local efforts in destroying them, a grant of £1,000 was made available, subject to regulations, which were conveyed to agricultural societies and the divisional boards in the districts affected. The principle governing the regulations was, that local committees should be formed, collect subscriptions, upon which subsidy would be paid in proportion to the amount available, and direct the action to be taken for the destruction of the foxes. Notwithstanding the offer was made to the agricultural societies, it was only the divisional boards that responded, and then only ten boards set apart any funds for the purpose, the total amount subscribed not exceeding £110, and no actual claim has been received for endowment to be paid. The evil to contend against is so great, and the funds available are so limited, that apparently no further action than to vote the money above referred to has been taken. The work of destroying the foxes is greater than is generally imagined, and concerted action in affected districts would seem to be the only means of accomplishing any relief. The very habits of these animals make attack by those interested very difficult, for in many cases their camps are far away from the places where they obtain their food. Moreover, the results of raids that have been made upon camps have been by no means satisfactory, for the foxes congregate thereat by tens of thousands. The effect of a few shots among them does not do much damage, and merely makes those that are left more alert. The main body rise, remove themselves beyond the reach of the rifles, and do not again settle until they have wearied the watchers, and all is quiet again From whatever direction relief is to come it is not, I am sure, by means of shooting.

Mr. Pound suggested the dissemination of disease among them, and attempts have been made to obtain specimens, but up to the present without success.

Sugar-cane Beetle.—The grant of £1,500 in aid of local subscriptions for the destruction of the grub stimulated the efforts of the sugar-cane growers, and the results have been satisfactory, the destruction being much greater than heretofore. The sums raised by the three districts that participated in the subsidy denote the earnestness with which the farmers set to work, the subscriptions being so large that the subsidy thereon amounted to 17s. 1½d. in the £1, instead of at the rate of £1 per £1 as was intended. The payments were—

Insect Pests Destruction, Central Fund.

Mackay local subscriptions	...	£633	17	6	subsidy	£542	0	1
Goondi Beetle Destruction Fund		455	5	1	„	389	11	10
Herbert River Beetle Account	...	680	0	0	„	565	2	6

In addition to the destruction effected by the expenditure of this money, there were destroyed on Mourilyan Plantation 102,200 beetles, at a cost of £63 17s. 7d., the cost of labour being 1s. 3d. per 100 beetles. The tenants on the estate received payment of £48 3s. 3d. from the company for the destruction of 96,325 beetles, thus 198,525 beetles were destroyed for the sum of £112 0s. 10d. As the owners of this plantation failed to put in a claim for endowment before the whole of the amount available had been expended, they did not participate in the subsidy.

The details of the work performed at Mackay and Goondi have not yet been received, but the following particulars of the work done on the Herbert River may be interesting in this connection:—The quantity of white cockchafers destroyed amounted to 25,481 quarts, for a cost of £645 14s. 6d., and taking 10 lb. to equal one gallon, and 150 cockchafers to the 1 lb. weight, it will be seen that something like 1,055,650 chafers were destroyed for the above expenditure.

The efforts of the past year have placed a decided check upon these insects, and, it is thought, brings the danger within reasonable distance of extermination. In support of this opinion, the following extract from the secretary of

the Halifax Planters' Club, when conveying the thanks of the planters for the assistance rendered by the subsidy, is quoted:—"This season there has been a marked decrease in the general number of the beetles abroad, in consequence of last season's collections. The search for the insects has been more thorough than ever this year, and we look upon the difficulty—the most serious that has yet confronted the cane planter—as practically surmounted. Steady and persistent watch, with a comparative small outlay, every season will make the results lasting."

International Exhibition.—Excepting the Mining Court, no part of the Exhibition has obtained more interest from the public, or has received more commendation, than the display made by this Department. Notwithstanding the period of the year was bad for an agricultural exhibition, and that the time for the collection was very limited indeed, it is gratifying to me to be able to report that the twenty-one bays, each 15 x 30 feet, have been satisfactorily filled, that everything was in its place on the opening day, and that, in securing this end, great help was given by those societies and others who had been asked to assist in making the Court attractive, by supplying produce, &c. Excepting certain of the dairying apparatus and utensils, everything in the Court of the Department is of Queensland production. Visitors from Victoria have assured me that if such an exhibit could be seen in that colony it would ensure a large influx of population. This Department is deeply indebted to those societies, manufacturers, &c., who have conduced to the attractiveness of the Court, a description of which will be published in the *Journal* for August.

It may be interesting in this Report to roughly compare agriculture in 1886 and 1896, as shown by statistics, for which purpose the table here appended has been compiled. It will be seen that the progress has been satisfactory, the increase of land under crop in each year being about 10,000 acres. Dairying has not been included in the table, because in 1886 no statistics were collected of this branch of agriculture, and it would not be fair to make a comparison between 1896 and a later year than 1886; it can, however, be safely said that in 1886 there were not half-a-dozen cream separators in Queensland, and they were hardly in use that year. Now, the separators in use number between 2,000 and 3,000, from the small hand separator to the factory size driven by steam. Moreover, the butter and cheese factories actually in work during 1896 numbered forty-one, besides which about 150 creameries were worked in connection with these factories, so that it can be said that dairying has progressed to a greater extent during the past ten years than any other branch of agriculture, and has advanced without monetary assistance from the Government, for the loans that have been made under the Meat and Dairy Act have been raised by taxation for the benefit of dairymen, and paid by them. The sugar industry has made a similar evolution during the last ten years. The whole cultivation was confined to the plantations and the manufacture to the mills attached thereto. Now the whole system is changed, an alteration brought about by the Sugar Works Guarantee Act, and by the movement towards co-operation among the farmers, a movement that was only in its inception in 1885, and was commenced by the establishment of the Central Sugar Companies at Mackay, the Racecourse Central Sugar Company, and the North Eton Central Sugar Company. Now the Central Sugar Mill system obtains throughout the sugar-growing districts, and the cultivation of the cane is carried out by farmers on small areas as a separate industry.

A reference to the accompanying table shows that the three staple crops of Queensland—wheat, maize, and sugar—have made fairly satisfactory progress during the period under review, considering our small population. The fruit industry has also largely developed, there being 16,116 acres under crop in 1896, as against 10,143 acres in 1886. Now that the colony with its liberal land laws, salubrious climate, and the great possibilities in the direction of production are better understood in Great Britain, Europe, and in other parts of the world, it is, I think, safe to prophesy that the next ten years will show a far larger degree of progress than has the past ten years.

COMPARATIVE RETURN of the TOTAL EXTENT of LAND UNDER CULTIVATION for CERTAIN CROPS in 1886 and 1896.
(Compiled from the Returns of the Registrar-General.)

—	1886. Acres.	1886. Total Acres.	1896. Acres.	1896. Total Acres.	—
Wheat for grain	6,787		35,831		
„ hay	8,697		1,845		
		15,484		37,676	Total extent of land under cultivation in—
Oats for grain	138		1,881		1886 ... 221,843 acres.
„ hay	9,436		11,565		1896 ... 336,775 „
		9,674		13,446	
Barley for grain	768		1,122		
„ hay	365		282		
		1,033		1,404	
Maize, grain	...	75,566	...	115,715	Total extent of land under crop in—
Potatoes, English	...	4,952	...	7,672	
„ sweet	...	2,250	...	3,131	1886 ... 209,561 acres.
Coffee *	...	...	...	138	1896 ... 322,678 „
Cotton	...	15	...	280	
Sugar-cane	...	54,010	...	83,093	
Arrowroot	...	255	...	309	
Tobacco	...	90	...	994	
Lucerne hay	...	19,065	...	17,892	
Panicum hay	...	1,516	...	3,673	
Other grasses hay	...	201	...	80	
Green feed for cattle—maize, lucerne, &c., &c.	...	13,836	...	19,509	
Vines for wine	592				
„ table	573				
		1,165	...	1,842	
Bananas	...	1,497	...	4,477	
Pineapples	...	411	...	823	
Oranges	...	751	...	1,791	
Other crops, gardens, &c. ...	...	3,204	...	7,183	

* Returns of coffee were not collected prior to 1895, when 60 acres were under crop.

MARKETS.—In continuation of the table that appeared in the report of last year, a table showing the average price of certain products during the year to the 30th June last is submitted. The encouragement induced by the appreciation which the table met with last year has led me to again insert the averages, notwithstanding that they have also appeared in the *Journal*.

Average Monthly Market Rates (Top Prices) in Brisbane from 1st July, 1896, to 30th June, 1897.

Article.	—	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
	Per	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Bacon	lb.	0 0 6¼	0 0 6	0 0 6	0 0 6	0 0 6	0 0 6	0 0 6	0 0 6⅓	0 0 6¼	0 0 6¼	0 0 6½	0 0 6¼
Bran	ton	5 17 6	5 13 0	4 16 3	3 19 0	4 3 9	3 7 6	3 4 0	3 3 9	3 7 6	4 8 9	5 10 0	5 12 6
Butter (first) ...	lb.	0 1 3	0 1 4¼	0 1 4⅛	0 1 3⅝	0 1 2¾	0 0 9⅝	0 0 8	0 0 8¼	0 0 9¼	0 0 10½	0 1 3½	0 1 4 1/10
,, (second)	lb.	0 0 10½	0 0 11	0 0 11⅛	0 0 10⅘	0 0 9¾	0 0 5¼	0 0 4⅛	0 0 5½	0 0 5 1/16	0 0 6	0 0 9⅝	0 0 10⅝
Chaff, mixed ...	ton	5 0 7½	4 10 6	4 4 4½	4 3 0	4 3 1½	4 3 9	4 6 0	4 0 7½	4 1 3	4 6 10½	5 10 0	5 7 6
,, oaten ...	ton	6 1 3	5 0 0	4 13 9	4 12 0	4 18 9	4 13 9	5 0 0	5 0 0	5 2 6	5 6 10½	6 0 0	5 18 9
,, lucerne...	ton	4 10 0	3 17 0	3 6 10½	3 10 6	3 15 0	3 10 0	3 6 0	3 2 6	3 6 3	4 4 4½	5 10 0	5 8 9
,, wheaten	ton	4 5 0	3 16 0	3 16 3	3 10 0	3 6 3	3 5 0	3 9 0	3 10 0	3 8 1½	3 6 3	4 5 0	3 18 9
Cheese	lb.	0 0 6¼	0 0 7⅖	0 0 7¼	0 0 7⅖	0 0 8¼	0 0 7⅜	0 0 6¼	0 0 5½	0 0 5⅜	0 0 5⅜	0 0 6 1/16	0 0 6½
Flour	ton	13 0 0	13 2 0	13 2 6	13 18 0	17 0 0	16 17 6	17 3 0	16 7 6	16 0 0	16 0 0	16 0 0	15 8 9
Hay, oaten ...	ton	5 7 6	None	4 0 0	4 4 0	4 2 6	3 3 9	3 18 0	3 17 6	4 0 0	4 0 0	4 10 0	4 17 6
,, lucerne ...	ton	3 17 6	3 6 0	3 0 0	3 9 6	3 5 7½	2 3 2	2 4 0	2 1 3	2 7 6	3 5 0	4 17 6	4 8 9
Honey	lb.	0 0 2	0 0 2	0 0 2⅜	0 0 2½	0 0 2¼	0 0 2	0 0 2	0 0 2	0 0 2⅕	0 0 2	0 0 2½	0 0 2½
Japan rice (bond)	ton	12 16 8	13 2 0	13 10 0	13 8 0	13 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 10 0	13 17 6
Maize	bus.	0 2 4¾	0 2 0 2/5	0 2 0	0 2 1⅖	0 2 5¾	0 1 11¼	0 1 8⅜	0 1 11⅜	0 2 1¾	0 2 4	0 3 3	0 2 11¼
Oats	bus.	0 3 10	0 3 11 2/5	0 4 2¼	0 4 0	0 4 0	0 4 0	0 4 0	0 4 0	0 3 11¼	0 4 0	0 3 7½	0 4 0
Pollard	ton	6 2 6	5 15 6	4 18 9	4 0 0	4 5 0	3 12 6	3 9 6	3 10 0	3 11 3	4 12 6	5 17 6	6 3 9
Potatoes ...	ton	6 0 7½	6 1 6	5 16 10½	7 13 0	7 18 9	5 10 0	4 4 0	3 8 9	3 16 3	4 14 4½	6 0 0	5 18 9
,, sweet	ton	1 18 9	2 1 0	2 8 9	3 1 0	3 8 9	2 13 9	2 2 6	3 0 0	1 18 9	1 17 6	2 1 3	2 8 9
Pumpkins ...	ton	2 6 3	1 11 2	1 16 3	3 12 6	3 12 6	3 3 9	2 5 0	2 6 3	2 5 0	2 17 6	3 3 9	2 8 9
Sugar, white ...	ton	16 17 6	16 10 0	16 10 0	16 2 0	16 2 6	16 5 0	16 10 0	16 17 6	17 0 0	17 0 0	16 17 6	17 0 0
,, yellow ...	ton	14 1 3	14 6 0	14 5 0	14 2 0	14 3 9	13 6 3	13 16 0	14 12 6	13 17 6	14 2 6	14 10 0	14 5 0
,, ration ...	ton	12 15 0	12 10 0	12 15 0	12 8 0	12 2 6	11 15 0	12 2 0	12 12 6	12 5 0	12 2 6	12 15 0	12 2 6
Wheat	bus.	0 4 10	0 4 9 4/5	0 4 8¾	0 4 8⅕	0 5 6	0 5 0	0 5 2	0 4 11⅓	0 5 0	0 4 9	0 5 0	0 5 0
Onions	cwt.	0 9 9	0 11 4¼	0 12 5¼	0 16 6	0 16 0¾	0 7 6	0 7 10⅕	0 8 6	0 8 6	0 7 11¼	0 10 0	0 8 6/8
Hams	lb.	0 0 9¼	0 0 8⅘	0 0 8⅕	0 0 8⅘	0 0 9⅛	0 0 9	0 0 8⅖	0 0 8⅘	0 0 8⅖	0 0 8⅛	0 0 11⅞	0 1 4 7/8
Eggs	doz.	0 0 11	0 0 6⅘	0 0 5⅗	0 0 6	0 0 7	0 0 6⅖	0 0 8⅖	0 0 10⅔	0 0 8⅖	0 0 3 0	0 1 3	0 1 5 3/4
Fowls	pair	0 3 10½	0 3 10	0 4 0¼	0 3 9	0 4 3¾	0 3 11	0 3 6⅖	0 2 10½	0 3 1⅓	0 5 2¼	0 3 5	0 3 11½
Geese	pair	0 5 6	0 6 1	0 5 9	0 5 4⅘	0 6 5¼	0 6 3	0 5 9¼	0 5 9	0 5 2¼	0 5 10⅘	0 5 11	0 5 11½
Ducks, English	pair	0 3 4½	0 3 6½	0 3 7½	0 3 10⅚	0 3 8¼	0 3 8¼	0 3 3⅘	0 2 10½	0 2 8¼	0 2 10½	0 3 7½	0 3 6
,, Muscovy	pair	0 4 4½	0 4 6½	0 5 1½	0 5 0	0 5 3¾	0 5 6	0 4 10⅘	0 3 6¾	0 3 9¼	0 3 7½	0 3 9	0 3 7½
Turkeys, hens ...	pair	0 6 7½	0 7 1	0 7 7½	0 7 4⅘	0 8 1½	0 7 9	0 6 8⅘	0 6 2¼	0 6 2¼	0 5 6¾	0 6 7½	0 5 7½
,, gobblers	pair	0 13 4½	0 12 3	0 13 9	0 15 0	0 15 10½	0 16 9	0 14 10	0 12 1½	0 12 7½	0 10 7½	0 12 1½	0 9 7½

Seeds Distributed.

—The packages of seeds and plants distributed direct from the Department between 1st June, 1896, and 31st May, 1897, consisted of arrowroot, bananas, broom millet, buckwheat, bunya pine, canaigre, castor oil, Chewing's fescue grass, *Cinchona calisaya*, coffee, cotton, cowpea, divi-divi, eucalyptus, *Fourcroya gigantea*, Frenchmen's grass, gram, ginger, grape cuttings, hickory nuts, hoop pine, hops, indigo, Kaffir corn, limes, mangoes, melons

(Californian and Egyptian), Narico bean, olive, oats, pearl millet, peccan-nuts, popcorn, Queensland grasses, rice, rye, red Natal grass, ramie, shade-trees, sugar-cane, sweet potatoes, teak seed, tamarind, teosinte, Texas millet, tobacco, turmeric, wheat, yams.

The following is a short summary of some of the reports received last year of some of the seeds previously distributed :—

Buffalo Grass.—An excellent hardy fodder grass, spreading and standing dry weather well.

Chewing's Fescue.—Was largely distributed, but in the majority of cases the seed failed to germinate.

Egyptian Melons.—These seeds were obtained from the Victorian Department of Agriculture, and in the one report to hand the melons are described as being very suitable.

New Guinea Sugar-cane.—Batoe, Arabora, Chenoma, Iduari, McLean, and Akewa canes have been fairly extensively distributed by the Department, and though the reports received concerning them are variable, most of the varieties appear on the whole to be suited to the different districts in which they have yet been planted.

Popcorn.—Well suited to all parts of the colony. Makes a superior porridge meal ; is also an excellent poultry food, and a good fodder. Yields up to 50 bushels of grain per acre.

Red Natal Grass.—Well adapted for cultivation all over Queensland, nearly all the numerous reports received concerning it being extremely favourable. It is a good fodder, is hardy and a good yielder.

Sulla.—Unsuitable on the whole, although it grew well in one case at Laidley.

Departmental.—The past year has been the busiest in the history of the Department, and many new departures have been made, among which may be mentioned the transfer of the Stock Department, the inception of the operations under the Plant Diseases Act, the establishment of the Agricultural College and the State Farms at Westbrook and Hermitage, the commencement of a pure-bred dairy herd, the International Exhibition, the advertisement of Queensland in Germany by means of the display of samples of our products at the Museums, and in a similar manner in Great Britain and Ireland, and by the publication of a monthly journal in the place of the issue of bulletins at irregular intervals, the Agricultural Conference held at Gatton of representatives of all the Agricultural Societies, and the Intercolonial Fruit Conference. In addition, the ordinary work consequent on the establishment of a separte Ministerial portfolio has much increased, but notwithstanding the extra work placed upon the officers of the Department, I am pleased to be able to report that they have always cheerfully responded to the frequent necessary calls upon their private time, and that they have performed their duties faithfully and well.

Appended to my Report will be found the Reports of the Principal of the Agricultural College, the Colonial Botanist, the Fruit Expert, the Entomologist, the Dairy Instructor, the Overseers of the State Nurseries at Mackay and Kamerunga, and of the Curator of the Botanic Gardens.

PETER McLEAN.

REPORT OF THE PRINCIPAL OF THE QUEENSLAND AGRICULTURAL COLLEGE.

Sir,—I have the honour to submit the following Report upon the work and duties that have fallen to me as Instructor in Agriculture, and later on Principal of the Queensland Agricultural College, during the year ending 30th June, 1897.

General Duties.—By reason of the inauguration of the new Agricultural College enterprise my duties recently have followed very different lines from the familiar ones of previous years. Although the appointment of Principal of the College dates no further back than 25th June, nearly all the improvements in progress at the College

have, since about September last, been under my supervision, excepting the building contract, in charge of the Department of Public Works. Prior to that time I was called upon to give lectures here and there in farming districts, and to advise farmers in the concerns of their business, to report upon the agricultural possibilities of different districts, to prepare for publication bulletins and reports upon matters of agricultural interest, and to meet the demand of agriculturists for information by private correspondence.

Reports and Other Publications.—Two of the departmental bulletins have been written by me in the course of the year—namely, "Soil Wastes in the Cane Field," and "Silos and Ensilage." In addition the prospectus of the Queensland Agricultural College was prepared, together with a number of reports upon the agricultural capacities of various districts visited. My reports upon the districts, of which Winton and Cunnamulla are the business centres, have been given a wide publicity through the agency of the public Press. A fairly full report on the value of the Headington Hill estate for close settlement, under the terms of the Land Act of 1894, has been prepared during the present month.

New Districts Visited.—I desire in this particular manner to draw attention to certain extensive districts of the colony which prior to my visit were unfamiliar to me, and which presumably are new, in their agricultural relations at least, to most of our people. The district about Nanango, visited early in this year, has particularly interested me. It contains the largest area of really good, unoccupied, Government land that I know of in any part of the colony, convenient to seaboard and large towns. It adds to the advantages of rich soil a mild climate and generous rainfall, and so is calculated to produce largely of the great staples of temperate regions, such as wheat, maize, potatoes, lucerne, and hay. Considering that this district is less than 100 miles in a direct line from Brisbane, it would seem that it could scarcely fail to get a place in any scheme of the Government looking to the opening up of the newer portions of the colony to actual settlement. The visit to Winton and Cunnamulla was undertaken with the purpose of inquiring into the possibilities of farming, and especially wheatgrowing, upon the vast plains that surround these Western townships. This examination satisfied me that the hope, so often expressed, that the plains country of Western Queensland, like the great plains of North America, will ultimately be the theatre of large operations in wheatgrowing, will never be realised. The soil of this region certainly furnishes no obstacles to the realisation of this dream. Vast areas are the very perfection of wheat land. The climate, again, so far as heat and cold are concerned, is admirably suited to the growth of a considerable number of our most valuable wheats. It is the rainfall, or rather the lack of it, that forbids the growth of wheat under ordinary or natural conditions. In all of what may be called the middle West of Queensland excessive rain is followed by pronounced drought with a regularity that has the force of law. Moreover, the season of rains is with rare exceptions the first quarter of the year, and so is not available to crops, like wheat, occupying the land from May till October. I feel certain that some day the abundant surplus of artesian water obtainable in this section of the country will be an important factor in an agriculture that to some extent at least will embrace wheatgrowing. For the present, and for many years to come, that broad belt of rich and productive country extending westward from the Main Range from 100 to 250 miles, embracing the Carnarvon district, the Darling Downs, the Nanango district, and the Peak Downs farther north, will furnish ample scope for the energies of the rising generation of Queensland wheatgrowers.

Experiments.—The test of varieties of wheat which for some years have been carried on under my direction, have been repeated this year with the addition of many sorts not before dealt with. Our experiments at Allora were this year, as during the season immediately preceding, carried out upon the farm of Mr. William Deacon, while at Roma the experimental cultivation was a piece of ground furnished by Mr. P. Smith, whose farm has for a number of years been the seat of similar experimental undertakings. At Allora 499 varieties were sown, and at Roma 344. These experiments were especially interesting as being in a sense the culmination of a series. For a number of years many of the varieties planted last year had been grown and carefully studied with the object of giving the sorts of proved value a test upon the wheat farms of the colony. Many of the wheats under cultivation had shown great promise for growth under Queensland conditions, notably Blount's Fife, Blount's Lambrigg, Buckley's Rust-proof, Budd's Early, Freeling, Manitoba, Vennings, White Fife, and sundry of Farrer's crossbreeds. With these it had come to be simply a question of accumulating seed in quantity sufficient to give them a popular trial. Unfortunately, the seeding of 1895 resulted in complete failure. This meant much more to us than the loss of a crop, involving, as it did, the loss of much precious seed.

However, our duplicate stocks with seeds obtained from Dr. Cobb, of the Department of Agriculture of New South Wales, enabled us to continue the experiment last year with a very large number of sorts, as stated above. The season of 1896 has again proved unfavourable to the wheat crop generally throughout the colony, and our experimental varieties have proved no exception to the general rule. For weeks after planting no rain came, and much of the seed "malted" apparently; at all events it failed to germinate when sufficient rain had been received. The rains failed again at the critical time when the wheat was in bloom. The season's work with these wheats has therefore resulted in a very light yield of inferior grain, and, in the case of many sorts, no yield at all. In a word, the year's operations give us a certain quantity of seed wheat but no facts. So far as the experiments are concerned, we are almost exactly where we were two years ago. The present season the work has been continued upon the Agricultural College farm under conditions that at least are favourable to its successful prosecution. We now have 345 varieties in growth here. At this writing all are above ground and in very vigorous growth.

A scheme of fertiliser tests with sugar-cane at the State Nursery at Mackay was planned by me, and, so far as the planting and application of the fertilisers are concerned, was carried out under my direction. Here, again, the unparalleled drought of the past year has seriously interfered with the progress of the experiment, although the recent rains, I am informed, have greatly improved the appearance of the experimental plantings.

The Agricultural College.—The contract for the erection of seven buildings for the use of the College was let to Mr. R. Roe in July last. Shortly afterwards tenders were accepted for clearing and grubbing 232 acres, and about the same time the work of fencing off the two public highways which cross the farm, and filling out the numerous breaks in the boundary, was begun.

The ceremony of fixing the stump of the principal College building was performed by the Minister, in the presence of a large concourse of people, on the 22nd August, 1896.

The first ploughing done upon the College farm (32 acres) was let by contract in October last. The work was finished in January following, and 16 acres were planted to maize in the same month.

The contract period in College history may be said to have come to an end early in January, when the foreman of the farm entered upon his regular duties. Eleven superior work horses, selected by the foreman, were secured about this time. From thence forward a considerable force of carpenters and labourers have been employed on the various improvements in progress under my immediate control. The principal items of this six months' work are stated in what immediately follows :—

Stables and Tool-room (21 by 59 feet), having stalls for 7 horses and 3 wagons, with two tool-rooms and a feed-room.

Cow Shed (32 by 35 feet), containing stalls for 16 cattle.

Silo (12 by 16 by 12 feet), capacity 55 tons.

Men's Quarters (20½ by 32 feet), having one living room and four bedrooms.

Fences.—Two miles with top rail and three barbed wires, posts 9 feet apart. Three miles of barbed wire fencing made with three wires, posts 30 feet apart; has iron droppers between each two posts. A very strong and substantial barn-yard fence, equipped with necessary gates, has also been erected. All told, about twelve miles of fences of the best character have been built on the College farm since the commencement of operations.

These brief statements of fact give the skeleton outlines of the work done at the College farm in the course of a very busy year. The nature of the year's activities will be more clearly shown in a fuller statement of details.

Buildings.—The buildings in use for general college purposes comprise five in all. They embrace the main College building, three dormitories, and a connected kitchen and dining-hall. These are all plain, one-storied, wooden buildings, planned especially for the requirements of the College and the exigencies of the Queensland climate. All have tall, pile foundations; broad verandas more or less completely surround each, while ample tank room ensures abundant supplies of good water. The College buildings will, with the removal of a few forest trees, nearly all be visible from the railway—a mile distant. From the veranda of the main College building nearly every part of the College farm can be seen.

The Main College Building.—This structure has a ground area of 70 by 112 feet over all. It contains two lecture-rooms each 14 by 25 feet, and one 15 by 20 feet, a library and study each 14 by 25 feet, a principal's room and visitor's room each 13 by 20 feet, and the secretary's office 15 by 20 feet. A 12-foot veranda surrounds the entire building.

Students' Dormitories, A and B.—These are rectangular buildings designed especially to furnish combined living and sleeping rooms for students Each is 37 by 74 feet over all, and each has twelve rooms 10 by 12 feet, two bathrooms and two lavatories, while a veranda 6 feet wide covers three sides of each building.

Teachers' Dormitory.—This building is planned to furnish quarters to a limited number of teachers and pupils. It contains two rooms 10 by 13 feet, and two 12 by 14 feet, with four rooms for pupils, and a sitting-room 12 by 24 feet. Two lavatories and two bathrooms are here provided, and a veranda 6 feet wide extends around three sides of the building.

Dining-hall and Kitchen.—This is a double structure, consisting of two nearly equal parts, dining-hall and kitchen, connected by a serving-room. The dining-hall is 42 by 57 feet, including verandas. The kitchen and servants' quarters include, besides the kitchen proper, three bedrooms and two storerooms. The laundry is a separate building made of iron.

In addition there are two comfortable houses, one in use by the principal and the other by the farm foreman. A third house is planned, but much of the work of construction will be given over to students suitably directed.

Academic Work.—The above statement of facts serves to outline the material progress of the school. That to which all this preparation leads—namely, the work of teaching—has not been lost sight of. The services of the following gentlemen have been secured for teaching in the several lines indicated in their titles :—

J. C. Brunnich (chemist of the Department of Agriculture), Chemist
P. M. Pitt, English, Surveying and Mathematical Master
J. Hermann Schmidt, Natural Science Master and Secretary
H. C. Quodling, Foreman of Farm
H. W. Gorrie, Horticulturist
R. N. F. Quinn, Mechanic
R. W. B. Williams, Chief Steward.

These gentlemen come to the work highly recommended for fitness as teachers, in the special educational work which the Agricultural College is called to perform. In addition to the executive duties which fall to me as Principal of the College, the management of the College farm will, in a special degree, fall within the range of my duties. Mr. H. C. Quodling entered upon his duties as foreman of the farm early in January, and Mr. H. W. Gorrie began work as horticulturist in March. Both have shown ability and energy in the prosecution of their respective duties. The other members of the teaching staff begin work with the commencement of the College year, 1st July proximo.

Study and Work of Students.—At the end of the year covered by this report, twenty-four students have been examined and admitted to the privileges of the College. These young men come from very widely separated sections, ranging from the Herbert River, in the North, to the southern boundary of the colony. In the distribution of duties to students, according to their several abilities, the plan outlined in the prospectus of the College has been followed substantially. The students are at present grouped in two nearly equal divisions—A and B. The A's comprise the more advanced students, and the work assigned to them is considerably in advance of that given to division B. The plan of work proposed may, in its simplest form, be thus stated : a day of work in the field, and a day of study and work, in class and out, constantly alternate, in the case of every pupil. Truly a system such as ours, which gives to the two halves of man's nature equal opportunities, must be theoretically sound if ideal conditions are not reached in its application. Thus each working day of the week, the "rousing bell" will call one of the divisions to work at 5·45. Then the stock are looked after, the horses cleaned, fed, and harnessed, and other necessary work done in preparation for the day's work to follow. The breakfast bell sounds at 7·15, and at 7·45 all students meet in the assembly room. This morning gathering of teachers and students affords the Principal an opportunity for announcements and for counsel and advice to the students, as the need for it arises from day to day. The division having Monday in the field will spend Tuesday in study and in the class-room, and these have, in addition, three hours of "industrial" or instruction work. This, in brief, is the routine proposed for the first year in the existence of the Queensland Agricultural College.

Course of Study.—On page 17 of the prospectus of the College, a course of study, covering three years, is outlined. This scheme is the basis of that adopted for use during the first half of the new College year.

The following arrangement of the course proposed shows the work for one week :—

Division A.—Advanced class—agriculture (lectures) 2 hours ; arithmetic, 2 hours ; botany, 2 hours ; chemistry, 2 hours (taken by a portion only of the division and in lieu of 2 hours in English) ; drawing, 2 hours ; English, 3 hours.

Division B.—Agriculture (lectures), 2 hours ; arithmetic, 3 hours ; botany, 2 hours ; drawing, 2 hours ; English, 2 hours.

The curriculum here laid down seems well calculated to prepare the student for the more advanced scientific work proposed for the second and third years of the course.

The College Farm.—The total area of land set aside for the use of the Agricultural College is 1,692 acres. Of this there are about 500 acres of inferior ridge land, the remainder being level country, for the most part of excellent quality. Along the railway line, following the southern boundary, there is a narrow strip of low "melon hole" country, which will need draining before it can be brought into arable condition. Then, again, on the north-east there are a few acres of swamp, while, following the ridge above referred to, there are here and there smaller areas of low "melon hole" land. The total, however, of all this wet land is, in comparison with the good land, insignificant. It is most unfortunate for the College that nearly the wettest and most forbidding portion of the estate touches the railway line and thus is seen by every observant passer. Doubtless this fact has much to do with the unfavourable reports current concerning the College farm. I have no hesitation in saying that there are fully 1,000 acres of first-class farming land within the present limits of the College farm. Of the remaining 700 acres, 200 acres can, with ditching and proper treatment in other respects, be made nearly equal to the best of the "good land." The 400 odd acres of ridge land are mostly valuable for grazing alone ; but this ridge furnishes a site for College buildings and "grounds" that can hardly be surpassed. I go thus at length into the character of the College farm, in order to correct, as far as possible, the widely current unfavourable, and mostly untruthful, reports concerning it. The College farm is suited to the growth of great crops of the great staples, particularly maize, lucerne, root crops, and various forages such as setarias and sorghums. It is most fortunate that a large amount—200 acres or more—of the best land upon the farm is capable of irrigation by gravitation. The abundant waters of the Lockyer are contiguous to this strip of country for a mile or more. Like most of the good land of the world, the College farm will grow weeds as vigorously and successfully as crops, and as the farm generally is what farmers call "strong" land, it is plain that crops will not be grown without work. Then we have a share of nut-grass, a weed pest which has many of the characteristics of the worst weeds known. In a few places, especially along the Lockyer, it is abundant. Generally, however, it is found in widely separated patches, and often large areas are completely free from it. But if nut-grass is a permanent nuisance to Queensland agriculture it certainly ought to have a place upon the College farm. Here, if anywhere, the best means of coping with it ought to be made plain.

Farmers' Meetings.—A number of farmers' gatherings have already been held at the College. In April the public was invited to witness the operation of filling the College silo on the 16th day of that month. Although no special efforts were made to give publicity to the invitation, fully 200 people, largely farmers and their wives, presented themselves on the day appointed. Our visitors came from districts as widely separate as Warwick, Nanango, and the north coast line of railway. The entire process of cutting the corn crop, hauling it to the silo, and there chaffing and filling it was followed by the company with every show of interest. A month later a smaller gathering witnessed the completion of the work of ensiloing the maize crop. A delegates farmers' conference was held at the College, on the invitation of the Minister, 10th, 11th, and 12th June. This was a representative gathering of farmers and planters coming from nearly every agricultural district of the colony. The deliberations of the conference were carried through two full days of three sessions each, a final session in the third day concluding the proceedings. This congress of farmers' representatives will long be remembered as the most successful and satisfactory farmers' meeting ever held in Queensland. The papers presented were generally of a high character, and the discussions, while full and spirited, were entirely free from political bias and that peculiar spirit of reform which is voiced in a wild cry for Government help. Our work has evidently interested a portion of the public resident in the immediate neighbourhood of the College. Interested visitors from far and near are received almost daily, and it has been the rule to give to all comers every opportunity to understand what is being done at the Agricultural College.

Cultivation and Crops.—Considering the very brief time which has elapsed since work was first undertaken at the College farm, not much in the way of results in cropping can be expected. The season, too, has been greatly against farming on new land. On account of the protracted drought, the newly ploughed sod failed to decompose in time for its reduction to the necessary tilth. This fact added greatly to our difficulties experienced in attempting to bring the new land under crop. Nevertheless 16 acres were planted to corn late in January, and in March 7 acres of potatoes and a considerable area of garden vegetables were added to the cultivated area. The corn gave us a great crop of fodder, and, in part, a fair yield of grain. The potatoes, however, were a complete failure, no rain having fallen from the time of planting to long after the time when the crop should, under normal conditions, have been ripe. The garden vegetables have given a great yield, due largely to good land, persistent watering, and intelligent care. Our maize crop, reduced to the condition of silage and fodder, has proved immensely useful. We are hopeful of being able to carry our stock of forty odd head of cattle through the winter without spending £1 for fodder. The writer was among the pioneers in ensilage-making in the United States, and so may be supposed to know the value of the system there. From what I know of silage-making and the needs of farm stock in Queensland, I am quite of the opinion that this method of preserving fodder is of even greater value to Queensland farmers than it has proved to the cultivators of Europe and North America. The process of ensiloing fodder is one of the few modern improvements in agriculture the value of which has not been overstated.

Future operations upon the College farm must, of course, be governed by circumstances to a certain extent. Withal a large amount of useful work has been done in the direction of a general plan covering, in next year's operations, the growth of 50 acres of maize and 10 acres of potatoes, the preparation of 50 acres of land for lucerne, the planting of an orchard and vineyard, and a wide range of experimental plantings of grains, forage, legumes, and oil-bearing plants. Not the least useful part of the work proposed for the College, considering the needs of students and the colony at large, is the testing of methods new and old by the rigid standard of science.

Live Stock.—At the present writing the College owns specimens of the following breeds of dairy cattle namely:—Ayrshire, Holstein-Freisian, South Coast (N.S.W.), and Jersey. Of Ayrshires there are two bulls and eleven heifers; of Holstein-Freisian, a pair-bull and heifer; of South Coast cattle eleven heifers and one bull; while the number of Jerseys is limited to a single heifer. The Ayrshires were purchased by the manager of the Travelling Dairy, Mr. John Mahon, of various Victorian breeders. The remainder of the herd were selected by myself: the South Coast and Jersey cattle in the Kiama district, south of Sydney, while the Holsteins came from the well-known Victorian herd of Mr. David Mitchell, of Lilydale. The herd as at present constituted is a long step in the direction of the establishment of a first-class dairy herd upon the College farm.

Implements and Machines.—A fairly satisfactory stock of colonial, English, and American machinery and tools has been secured. These include, besides the usual staple appliance of every well-stocked farm, a number of machines that are new in the agricultural practices of this colony. It is believed that these modern appliances of farming will prove instructive to colonial farmers and furnish many useful hints to local manufacturers. Among the tools recently secured are bench tools for twelve benches, with a complete outfit of tools and furnishings for a blacksmith's shop. Appended is a complete list of the farm machines and implements now on hand and in use.

In bringing this Report to a conclusion, a multitude of matters concerning the future of the newly created school come to mind. It seems, on reflection, however, hardly necessary here to speculate upon the outcome of work not yet begun, or to voice hopes that may be beyond the power of the officers and students to realise. The Queensland Agricultural College is now organised for work; from this time forward it will be a maker of facts by which an estimate of its future usefulness can be formed. This is assured as much as anything in the future can be certain—namely, that the organisation and equipment of the school and the public sentiment back of it all will make it agricultural in a most intensely practical way.

Respectfully submitted,

E. M. SHELTON, Principal.

To the Under Secretary for Agriculture.

LIST OF IMPLEMENTS AND TOOLS AT AGRICULTURAL COLLEGE.

1 Marshall's portable steam engine, 6 h.p.
1 Power chaff cutter, 10-inch, fitted with elevator
1 Saw bench ; also 2 circular saws
1 Ithaca corn-sheller (power)
2 Wagons
1 Wagonette
1 Express wagon
1 Tip dray
1 Avery weighbridge.

Ploughs.

1 Four-furrow gang plough
1 Two-furrow gang plough
2 American walking ploughs, 14-inch
2 English-type walking ploughs
1 Turnwrest walking plough
1 Subsoiler.

Harrows.

1 Two-horse disc harrow
1 Three-parts strong pulverising harrow
1 Three-parts "Lever" smoothing harrow
1 Two-parts smoothing harrow
1 Acme harrow
1 Seven-cylinder roller

Cultivators, &c.

1 Two-horse walking cultivator, spading tine
1 Horse "Planet Jr." cultivator
1 Hand "Planet Jr." cultivator and seed drill
1 Breed's weeder

Drills.

1 Corn-drill
1 Check row-planter
1 Corn-marker
1 Lister
1 Buckeye mower
1 Wooden hay "Tumbler" rake
1 "Scientific" harvester for corn
1 Rotary stalk-chopper for corn
1 Earth-scoop
1 Wheelbarrow
1 Forest devil
3 Three-horse sets of whippletrees
2 Two-horse sets of whippletrees
6 Picks
9 Long-handled shovels ; 6 short, mixed design
8 Mattocks
12 Axes, assorted sizes ; 2 running-out axes
4 Adzes
4 Cross-cut saws
3 Spud-bars
9 Spades
4 Draining spades
6 Dutch hoes
17 Hoes
1 Double-headed mortising axe
2 Finishing single mortising axes
2 Sets wedges and maul-rings
8 Digging forks
8 Light garden rakes
6 Wooden hay rakes
2 Hand-saws, spirit level, 2 1-inch socket chisels, 1 2-inch socket chisel, 4 engineers' files, 4 hand-saw files, set square, 2 rules, &c.
6 Scythe-blades, 4 snathes, brace, 2 1¼-inch augers

Plumber's Shop.

Fittings, as follow:—

2 Pairs stocks and dies, ¾-inch to 1½-inch, and 1½-inch to 2-inch—gas
2 Pairs stocks and dies, ¾-inch to 1½-inch, and 1½-inch to 2-inch—engineers'
4 Screwing taps, ¾-inch, 1-inch, 1½-inch, 2-inch —gas
4 Screwing taps, ¾-inch, 1-inch, 1½-inch, 2-inch —engineers'
1 Ratchet brace
3 Pairs snips, assorted sizes
3 Copper bits, assorted sizes
2 Pipe-cutters
2 Pipe-wrenches
2 Pairs pliers
1 Pair cutting pliers
Spirits of salts
Solder
Leadhead nails
Red and white lead
Galvanised corrugated iron, large stock
Ridge-capping
O.G. guttering
Plain galvanised iron
2 Tool baskets

Blacksmith's Shop.

Fitted up as follows:—

Full-sized forge
1 Large anvil
2 Striking hammers
1 Hand hammer
24 Files, assorted sizes, flat, half-round, and round
12 Rasps, assorted sizes, flat, half-round, and round
1 Drilling machine and drills
1 Complete set farrier's tools
1 Tail-vice
3 Pairs tongs
1 Oil-feeder
2 Leather aprons
2 Pairs pliers
Stock of iron—flat, round, and shoeing iron—all sizes
Stock of shear and blister steel.

Carpenter and Joiner's Shop.

Schedule of Tools, &c., for 12 Students.

6 Double benches
12 Sets of tools, each set comprising –
1 Trying plane
1 Jack plane
1 Smooth plane
1 Rebate plane
1 Mallet
1 Claw hammer
1 Bench hammer
6 Firmer chisels
6 Mortice chisels
3 Gouges
1 Paring chisel
1 Oilstone
1 Oilstone slip
1 Oilcan
1 Pair compasses
1 Bevel
1 Twelve-inch square
1 Six-inch square
1 Screwdriver
2 Single marking gauges
1 Mortice gauge

LIST OF IMPLEMENTS AND TOOLS AT AGRICULTURAL COLLEGE—*continued.*

CARPENTER AND JOINER'S SHOP—*continued.*

12 Sets of tools, each set comprising—
- 1 Drawknife
- 1 Two-foot rule
- 1 Small axe
- 1 Cold chisel
- 1 Ratchet brace
- 1 Set bits, assorted, twist and nail
- 1 Hand-saw
- 1 Rip-saw
- 1 Tenon-saw
- 1 Compass-saw
- 1 Bow-saw and frame
- 1 Saw-set
- 1 Spirit-level
- 2 Nail-punches
- 2 Spokeshaves
- 1 Pair pincers
- 2 Bradawls
- 1 Cork rubber
- 1 Tool basket

In addition to the 12 sets provided for each student the shop is provided with—
- 1 Set hollows and rounds
- 1 Set bead planes
- 3 Ploughs and bits
- 2 Moving philisters
- 2 Framing cramps
- 2 Sash cramps
- 2 Flooring cramps
- 3 Glue-pots
- 6 Glue-brushes
- 1 Old woman's tooth plane
- 4 Pair sash planes
- 2 Plumb-bobs
- 6 Chalk lines
- 6 Dozen saw files
- 2 Dozen mill saw files
- 1 Ream assorted sandpaper

Large stock of nails of all descriptions
Large stock of screws of all descriptions.

REPORT OF THE COLONIAL BOTANIST.

SIR,—I have the honour to submit the following Report of the work accomplished for the year ended 30th June, 1897 :—

It is encouraging to find that year after year public interest in the study of botany in the colony increases. Besides naming plants and furnishing other information regarding plants for persons within the colony, I have answered many inquiries from persons beyond, thus showing the appreciation in which our Botanical Department is held.

One Botany Bulletin, No. XIV., has been issued since last Report, and further additions to the flora were published in the first number of the *Agricultural Journal.* The issue of the "Companion to the Queensland Student of Plant Life" (1893) and "Botany Abridged" (1894) having become exhausted, it was found necessary, owing to the constant demands for these works, to print a second edition.

Last spring an exhibition of wild flowers was held in the Museum attached to this office, and as to each exhibit the names and other particulars were attached, many took advantage of this to obtain the information thus afforded, while others were content to see and admire alone. I have to tender my thanks to those persons who so kindly and rapidly responded to my call for flowers of indigenous plants for this object.

I have much pleasure in reporting that a start has been made in the establishment of a grass garden. The Acclimatisation Society has generously placed a plot of land at our disposal for the purpose, and, thanks to the exertions of Mr. W. Soutter, its indefatigable manager, small plots of a number of our notable grasses may already be seen growing in the gardens of the society at Bowen Park. These I intend extending until the whole grass flora of the colony is represented and means afforded of obtaining authentic seed for further experimental cultivation.

During the year the Museum has been enriched with further specimens of timbers, gums, fruits, &c. Five cases containing about 600 kinds of indigenous timbers, polished and unpolished; five cases of economic plant-products; a large collection of fibres, many of which were obtained from the Kamerunga State Nursery; and also a number of pictures were removed to the Exhibition at Bowen Park, where they have commanded a deal of attention from visitors, especially those from beyond the colony.

In January last I visited Nerangba to investigate the cause of the deaths of cattle supposed to have died from eating poisonous plants. A report on this matter was furnished you on my return. I paid a visit to Warwick to act as judge at the show in February, and while there had the advantage of meeting many of my correspondents who had come from about the district to visit the show. Opportunities of this kind should always be taken, for a short conversation is far better than even a lengthy correspondence.

In November last I sent my assistant for a collecting trip in the South-west portion of the colony, the result being a good collection of herbarium specimens, including new species, as well as fresh grasses for the grass garden. He also visited the Darling Downs and collected seeds and living plants of many of the grasses of that district for this latter purpose. The past season has not been what one would have wished for grass collecting.

I have recently returned from a visit to the extreme Northern portion of the colony. During my absence I examined, took notes, and collected specimens of all the plants of special interest which came under my notice on Thursday Island, Hammond Island, Goode Island, Turtle Island, as well as upon the mainland in the vicinity of Somerset. At this latter place I found the flora to be very rich, and I am hopeful of finding among the specimens collected there several new species, but of this nothing definite can be said without making a very careful examination.

Through the kindness of Mr. Frank L. Jardine, who gave me every assistance in collecting, and even sent out to distant localities where he knew certain plants were probably alone known to exist, I saw a good deal of the country around Somerset, and it occurred to me that here would be an excellent locality for a State Nursery or experimental ground for those tropical products which may probably never prove wholly successful in the more Southern parts. For instance, a "rubber plantation" might be formed, and all the various kinds tested, both as to their suitability for our climate and also as an industry for settlers and investors to embark in. Among the indigenous plants also of this district it is very probable that kinds may be met with from which "rubber" could be obtained equal to any at present being gathered in New Guinea or elsewhere, for be it remembered these parts have been but little explored botanically.

I cannot speak too highly of the kindness of the Government Resident, the Hon. John Douglas, who supplied me with the means of visiting the places previously mentioned, and rendered my labours both pleasant and comparatively easy. I should have liked in this place to have mentioned some of the most interesting or new species of plants found; but it would not be well to be too hasty in the determinations. The work, however, will be pushed on with, and the descriptions and notes given from time to time in the publications of the Department. I let no opportunity escape of obtaining seeds of the indigenous plants for which many of my foreign correspondents are so continually writing. From a botanical point of view, I consider my visit to the North has been fairly successful, and I hope, when all my specimens are worked out, that the Minister will also be satisfied that this botanical trip which he sanctioned has not been without benefit to the colony.

A number of noxious weeds and suspected poison plants have been received for determination and report, but the majority of these have been referred to in previous reports, and the others do not call for special mention here. I may here take the opportunity of again referring to the evil character given to the fruit of *Rhodomyrtus macrocarpa*, a shrub of North Queensland. The fruit when in a healthy condition is quite wholesome, either for using in a fresh or cooked state; but is frequently attacked by a fungus, and in this state is recorded to have produced blindness, paralysis, and even death to those who have eaten it. I pointed this out in "Botany Bulletin No. X," p. 37, about two years ago, and hoped that some of our medical men would long ere this have investigated the matter, but as such seems not to have been the case, I again draw attention to it. Fungoid blights have scarcely been as prevalent as usual. I noticed, however, that *Ustilago australis*, Cke., was very bad on the fruit of a species of Panicum near Brisbane, and also on an Eriachne from the Western Plains. *Diachæa leucopoda*, Bull., was destructive to some bush-housed lants, and *Vermicularia herbarum*, West., to Carnations. Some of the blights mentioned in previous reports have again been noticed during the past year.

A number of oils have been distilled from various plants. No doubt many of these would prove of value if better known, and I shall therefore, when sufficient is obtained, send a sample of each to some good European authority upon the subject for report, as possibly by this means a profitable industry may be formed in the colony, considering how rich we are in such-like plants, particularly in the Orders Rutaceæ and Myrtaceæ. The common Pennyroyal (*Mentha satureioides*) which belongs to the Order Labiatæ, several of which are also oil-bearing, may be given as an instance, as one which gives an oil in greater quantity than that of the true "Peppermint" and seems to quite equal the oil of that plant in strength and fragrance.

With the money allowed for the Botanic Library I have procured some few much-needed books.

I feel that I cannot conclude the present report without referring to the great loss Australia has sustained by the death of the late Government Botanist of Victoria, Baron Sir Ferdinand von Mueller, which sad event took place in October last. It would be quite impossible in a brief notice like this to enlarge upon the great benefit his works, which will carry his name down to the further end of posterity, have been to other workers in the field of botany.

F. MANSON BAILEY, Colonial Botanist.

REPORT OF THE FRUIT EXPERT.

Sir,—Since my arrival in this colony my time has been fully occupied, so much so in fact that I have been obliged to refuse several invitations to visit different parts. Up till now my visits have been confined to the Southern portion of the colony, but I hope shortly to visit both the Central and Northern districts. So far my main object has been to make myself conversant with the soils and climatic conditions of the districts that I have visited, but at the same time I have been enabled to give a considerable amount of information to fruitgrowers generally. Until I have visited the more tropical portions of the colony I consider it premature to make any general statements as to the fruitgrowing capabilities of Queensland as a whole, but from what I have already seen there is a good opening for certain branches of the fruitgrowing industry, provided that the work is carried out in a systematic and thoroughly business-like manner. I am glad to say that in every part of the colony that I have visited I have been well received by fruitgrowers, and that my lectures and spraying demonstrations have been as a rule well attended, my audiences being attentive and evidently desirous of obtaining any practical information relating to any of the various branches of fruit culture.

I have delivered lectures and visited orchards in or near the following places—viz., Zillmere, Redland Bay, Wellington Point, Toowoomba, Gatton, Laidley, Rosewood, Roma, Mitchell, Wallumbilla, Allora, Stanthorpe, Beenleigh, Maryborough, Bundaberg, Burpengary, Woombye, Ipswich, and Cleveland; and have given spraying demonstrations at the following places—viz., Zillmere, Toowoomba, Maryborough, Gatton, Laidley, Allora, Cleveland, Redland Bay, Wellington Point, and Roma.

I have also visited orchards in or near the following places:—Several of the suburbs of Brisbane, various islands in Moreton Bay, Pimpama, Mount Cotton, Oxley, Blackall, Buderum Mountain, and The Burrum.

In addition to visiting these districts and attending to fruit matters generally, I have paid a number of visits to the Westbrook and Hermitage Experiment Farms, which are under my supervision, and have visited and reported on a portion of Daandine Run, near Macalister. I have also acted as a judge of fruit at the following shows:—Toowoomba, Allora, Warwick, Stanthorpe, and Maryborough. I have devoted considerable attention to the important question of fruit pests, and am glad to say that Queensland has now taken steps, by passing "*The Diseases in Plants Act of* 1896," that will enable action to be taken which will give fruitgrowers a chance to compete with those pests which are now so prevalent in their orchards, and against which individual or isolated action is more or less useless, good results being only obtained by concerted action, and concerted action is only possible when it is made compulsory.

I have dealt with the question of fruit pests from a purely practical standpoint, leaving matters of detail to my colleague, Mr. Tryon, from whom I have received much valuable assistance and a hearty co-operation in this branch of my work.

I have done little literary work, the only bulletin that I have written being one on "Spraying," reserving all that I have to say about fruit culture for the *Queensland Agricultural Journal*.

During June an Intercolonial Fruit Conference and Fruit Show was held in Brisbane. The Conference discussed a large number of matters of great importance to the fruit industry of Australasia, and in my opinion did very good work, that will result in benefiting fruitgrowers generally. The whole of the papers and discussions are being printed, and will be found to contain a vast fund of useful practical information, the result of the actual experience of the best fruitgrowers throughout Australasia. The fruit show was very good, and representative of the fruitgrowing capabilities of Australia.

Experiment Farms.—During the year two Experiment Farms have been started—one at Westbrook, near Toowoomba; and the other at Hermitage, near Warwick. Work was only commenced at Westbrook on 8th February, and at Hermitage on 10th March, and, notwithstanding the unfavourable and exceedingly dry autumn, good progress has been made. At these farms all kinds of farm crops—vegetables, fruits, vines, economic and fodder plants, will be carefully tested under various methods of culture, and accurate records will be kept of the results of all experiments. Many experiments will be carried out with many kinds of wheats and other grains, and those varieties that are found to be of most value in the district will be grown for seed purposes, every care being taken to improve the quality and yield of the grain, and to

encourage its rust-resistant qualities. Experiments will be made with various manures, and the relative feeding and milk-producing qualities of various fodders will be determined. The following is a brief summary of the work already done:—

Westbrook.—Some 140 acres of forest land have been cleared of timber, the roots of all trees having been run to a depth of 18 inches. This work has been thoroughly well carried out. Two and a-half miles of substantial boundary fences have been erected—the fence of post and wire and best 1½-inch wire-netting. Half-a-mile of light division fencing has also been erected. Some 50 acres of land has been ploughed, a considerable portion of which has been cross-ploughed. Various plots of oats, barley, and wheat have been sown, and a collection of 333 varieties of wheat from Dr. Cobb's stud plots has been carefully planted. A good cottage has been erected for the manager, Mr. H. Tardent, and a substantial useful shed has also been built. Some 20 acres of land has been subsoiled to a depth of 16 to 18 inches, and this will be planted in fruit trees and vines this season. Owing to the dry weather and the stony nature of the soil, the preparation of the land has been a difficult and somewhat expensive matter, but the work has been well done, and I have no doubt that the trees and vines planted in it will show good results.

Hermitage.—Some 70 acres of land have been ploughed and cross-ploughed, and about 50 acres of this have been sown with oats, wheat, and barley. Some 20 acres are being subsoiled to a depth of 18 inches, and will be planted with fruit trees and vines this season. A good cottage, similar to that at Westbrook, has been erected for the manager, Mr. C. Ross, who only entered upon his duties the last week in June. The dry weather has greatly retarded the work of this farm, as the land was exceedingly hard to break up, but when once broken a fine tilth has been obtained.

A. H. BENSON.

REPORT OF THE ENTOMOLOGIST.

Sir,—I have the honour to submit the following Report for the year ending 30th June, 1897, relating to the work of the branch of the Department with which I am officially connected.

ECONOMIC ENTOMOLOGY.

INFORMATION FURNISHED.

The following injurious insects, specified under the names of the plants that they damage, have formed subjects for investigation, having been brought under notice by correspondents or visitors who have sought information regarding the habits or the means most suitable for contending with them:—

Apple.—Leaf-eating Weevil (*Leptops sp.*), Bundaberg; Leaf-eating Beetles (*Rhyparida sp.* and another), Bald Hills; Conogethes Caterpillar (*C. punctiferalis*), Brisbane; Soft Brown Scale (*Lecanium hesperidum*?), Bundaberg and Cooroy; Parlatoria Scale, Brisbane and Bald Hills; Tree Cricket (*Œctanhus sp.*), Brisbane; Fruit Fly (*Tephritis sp.*), Brisbane and elsewhere.

Pear.—Long Soft Scale (*Lecanium longulum*), Rockhampton.

Quince.—San José or Pernicious Scale (*Aspidiotus perniciosus*), Allora.

Plum.—Fruit Fly (*Tephritis sp.*), Brisbane.

Peach.—Fruit Fly (*Tephritis sp.*), Brisbane and elsewhere.

Fig.—Fig-leaf Beetle (*Galerucella australis*), Brisbane and elsewhere; Fruit-entering Bug, Western districts; Red Scale (*Aspidiotus aurantii*), Brisbane.

Orange, Etc.—Leaf-gauging Beetle, Buderim and Rosewood; Bud-eating Beetle (*Pyropida sp.*), Geraldton; Bronze Bug (*Oncoscelis suleiventris*), Zillmere, &c.; Fruit-borer (*Conogethes punctiferalis*), Brisbane, &c.; Fruit-sucking Moths (*Ophiderinæ*), Rockhampton; Orange Mite or Maori (*Phytopus oleivorus*), Redland Bay, Maryborough, Esk; Ditto on Lemon, Brisbane; Pink Wax Scale (*Ceroplastes rubens*), Burpengary, Pine River, &c.; White Scale (*Chionaspis citri*), Marburg, Childers, Esk, and Bundaberg; Soft Scale (*Lecanium hesperidum?*), Cooroy, Roma; Red Scale (*Aspidiotus aurantii*), from several districts; Long Soft Scale (*Lecanium longulum*), Glasshouse Mountains, &c.; Fulvous Mussel Scale (*Mytilaspis fulva*), Cairns and Mount Cotton; Parlatoria Scale (*Parlatoria sp.*), Mount Cotton; Red Spider (*Tetranychus sp.*), Bundaberg, Buderim, and Brisbane; "Scab" (of insect origin), Brisbane and Cairns; Fruit Fly (*Tephritis sp.*), Brisbane.

Persimmon.—Green-banded Leaf Beetle (*Cryptocephalus*), Brisbane.

Mango.—Leaf-eating Beetle (*Liparetus depressus*), Bundaberg; White Scale (*Mytilaspis*), Brisbane.

Custard Apple.—Conogethes Caterpillar (*Conogethes punctiferalis*), Brisbane.

Guava.—Leaf-eating Beetle (*Liparetus depressus*), Bundaberg; Greedy Scale (*Aspidiotus rapax*), Brisbane.

Mulberry.—Soft Scale (*Lecanium hesperidum ?*), Augathella.

Vine.—Flower-injuring Thrips (*Heliothrips sp.*), Roma; Leaf-eating Beetle (*Pyropida sp.*), Toowong; Fruit Fly (*Tephritis sp.*), Bellevue, Bowenville, Biggenden, Dalby, Maryborough, Pimpama, Brisbane, &c.; Root-galls (*Tylenchus sp.*), Biggenden; Long Soft Scale (*Lecanium longulum*), Brisbane.

Pineapple.—Mealy Bug (*Dactylopius*), Zillmere.

Brazilian Cherry.—Leaf-eating Beetle (*Liparetus depressus*), Bundaberg.

Pomegranate.—Conogethes Caterpillar (*Conogethes punctiferalis*), Brisbane.

Flacourtia.—Long Soft Scale (*Lecanium longulum*), Brisbane; Red Scale (*Aspidiotus aurantii*), Brisbane.

Macadamia Nut.—Fruit-borer (*Tortricidæ*), Brisbane.

Litchi.—Fruit-borer (*Tortricidæ*), Mackay and Brisbane; Conogethes Caterpillar, Brisbane.

Passion Fruit.—Fruit Fly (*Tephritis sp.*), Brisbane.

Date.—Leaf-eating Caterpillar (*Pamphila augias*), Brisbane.

Sugar-cane.—Scarabæid Grubs, Marburg, Isis Scrub, &c.; Grasshoppers (*Pachytylus migratorius*), Cairns; Mealy Bug (*Dactylopius*), Bundaberg.

Cow-Pea.—Bean Maggot (*Oscinis fabæ*), Isis Scrub; Insect Attack, Bundaberg; Plant Bug (*Riptortus annulipes*), Isis Scrub.

Beans.—Bean Maggot (*Oscinis fabæ*), Milton.

Potato.—Leaf-eating Beetle (*Amblochitus bicolor**), Logan; Potato Moth-borer (*Lita solanella*), Allora, Wide Bay, Toowoomba.

Sweet Potato.—Sweet Potato Weevil (*Cylas formicarius*), Cairns, Deception Bay, Corinda, Brisbane; Leaf-eating Hawk-moth Caterpillar (*Sphinx convolvuli*), Burpengary; Leaf-eating Cassidids (*Aspidomorpha interrupta*, Fabr., and *Coptocyla sp.*), Bald Hills and Toowong.

Cabbage.—Leaf-eating Pyrale, Calliope River and Roma; Stem-boring Pyrale, Brisbane; Caterpillars, Ipswich and Kilkivan.

Wheat.—Stem-boring Anthribid, Roma; Weevil (*Calandra oryzæ*), Beaudesert.

Lucerne.—Lucerne Flea (*Smynthurus sp.*), South Australia.

Cotton.—Cotton Bug (*Tectacoris Banksii*), Cleveland.

Turmeric.—Stem-boring Caterpillar, Cairns.

Shade Trees.—(1) Pepper-tree—Schænus—Mite Disease, Allora; Soft Scale (*Lecanium ? hesperidum*), Augathella; (2) Camphor Laurel Case Moth (*Thyridopteryx sp.*), Gympie; (3) Erythrina—Olive Soft Scale (*Lecanium oleæ*), Brisbane; Leaf-eating Beetle (*Aulacophora sp.*), Cairns.

Shade Trees (Native).—An instance of White Box (Eucalyptus) being killed by a bark injury insect (*Prosopis ?*), at Stanthorpe, was investigated.

Merchandise.—The occurrence of a small moth in large numbers in a Brisbane soft-goods warehouse occasioned some alarm on the part of those owning the articles stored therein. This, however, proved on examination to be *Plodia interpunctella*, an insect not injurious to textile products, probably introduced with packing to where it occurred.

Locusts.—The occurrence of grasshoppers in large numbers in the Clermont and Cairns districts was brought under notice; the special insect being in each case the same—viz., *Pachytylus migratorius*.

Parasites and Predaceous Insects.—No special study of either parasitic or predaceous insects has been made. Inquiries, however, have been received concerning a natural enemy of the Fruit Fly—a small hymenopterous insect belonging to the family Braconidæ and genus *Opius* that was discovered a few years since by the writer. Living examples, "in number," of the predaceous Ladybird (*Cryptolæmus montrouzieri*), a beetle whose useful work was first made known in a publication emanating from this office, have been furnished to my colleague of the New Zealand Department of Agriculture, Mr. T. W. Kirk, for use in contending with the Mealy Bugs of that colony. As an outcome of the enterprise of the Hawaiian Government, and of the skilful work of its Entomologist, Albert Koebele, this same beetle has already been established in the Sandwich Islands, where its services in checking the increase of several harmful insects belonging to the genera *Dactylopius* and *Pulvinaria* have been so pronounced as to show that the writer was fully justified in entertaining the opinion regarding its important services that he formerly expressed.

Identifications.—Many insects have been submitted for the purpose of identification, and these, as far as possible, have been specifically determined. This is a branch of research that alone necessitates a large expenditure of both time and energy.

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* Notwithstanding this insect was forwarded with the statement that it was a potato defoliator, there are grounds for concluding that the injury attributed to it, in consequence of its occurrence on the plants was actually accomplished by an Epilachna Beetle present also with it.

IMPORTED.

Insects.—The insects referred to in my previous Annual Reports, as being imported into the colony, still continue to arrive. As examples of these, may be mentioned the San José or Pernicious Scale (*Aspidiotus perniciosus*), the Apple Mussel Scale (*Mytilaspis pomorum*), the Orange Mussel Scale (*Mytilaspis fulva*, syn. *M. citricola*), and the Codlin Moth (*Carpocapsa pomonella*).

PHYLLOXERA.

Instances have occurred of both rooted vines and vine cuttings being surreptitiously brought into the colony in contravention of the law having for its object the prevention of the introduction of phylloxera. These articles are usually concealed in bundles of fruit-trees. Moreover, there exist grounds for concluding that these occurrences are not always brought to light, notwithstanding the careful scrutiny exercised by the Customs authorities. In one instance, in which rooted vines from a country in which phylloxera exists had been not only thus introduced but also planted, the vines themselves were rooted up and destroyed, and the soil in which they were growing suitably disinfected. Such illegal acts as are alluded to constitute a distinct menace to the vine-growing industry of the colony and its future development. It is worthy of consideration whether, as occasion may arise, legal proceedings, for the purpose of punishing offending parties, should not be taken that these undesirable occurrences may in future be prevented.

PLANT INSPECTION, DISSEMINATION OF PESTS AND DISEASES.

In connection with this subject, attention might be drawn to what has been already stated regarding it in the Annual Report of the Entomologist for 1895-6, since during the past year, 1896-7, similar undesirable instances, of the dissemination of injurious insects and diseases from establishments in which nursery stock and seeds are being raised, have come under notice. Moreover, it must be admitted, with regret, that the gardens and nurseries connected with the Department of Agriculture are not irreproachable in this respect. Whatever extenuating circumstances may exist in connection with the continued existence of insect pests upon orchard trees of large growth, these can but rarely be alleged, with reasonable attention to accuracy of statement, with regard to nursery stock, for in its case they can be dealt with readily by repeated spraying with one or other of the many insecticidal washes. There is therefore no excuse for the presence of insect pests upon such merchandise. But even if, at the time of its being sent out, nursery stock still harbours this class of enemy, the latter may be effectually killed at small cost by subjecting the plants so conditioned, or suspected to be in this case, to the action of hydrocyanic acid gas, that can be employed in their case by use of quite simple apparatus.

VEGETABLE PATHOLOGY.

Numerous matters relating to Plant Pathology proper—*i.e.*, to the changes attendant on parasitism on the part of vegetable organisms, and to the constitutional plant derangements arising from uncongenial soil or atmospheric conditions—have been referred to this branch of the Department. This will appear from the following enumeration of the topics within this domain that have been dealt with:—

Apple.—Bitter Rot (caused by *Glœosporium fructigenum*), Toowoomba; Bitter Pitt, Stanthorpe.

Pear.—Fruit Canker (caused by *Pusicladium dendriticum*), Toowoomba; Leaf Scab (primarily caused by a Mite-Phytopus), Toowoomba.

Plum.—Fruit Gumming, Brisbane; Fruit Rot, Toowoomba.

Peach.—Gumming Disease, Zillemere and elsewhere; Shot Hole (caused by *Phyllosticta circumcissa*), Brisbane; Black Freckle, Toowoomba.

Oranges and Lemons.—Die Back, Brisbane and elsewhere; Root Fungus, Blackall Ranges; Black Spot or Brand of Fruit, New South Wales; Skin Disease, New South Wales; Skin Diseases (two), Southern Queensland; Bark Fungus (*Corticeum sp.*), Brisbane and Cairns; Leaf and Fruit Scab, Brisbane, &c.

Mango.—Leaf Disease, Caboolture and Redland Bay; Fruit Scab, Zillmere, Indooroopilly, and Brisbane.

Fig.—Fruit Rot, Allora, &c.

Grape Vine.—Black Spot or Anthracnose (caused by *Glœosporium ampelophagum*), Brisbane, Toowoomba, Allora, Calliope River, Biggenden; Leaf Disease (caused by *Cercospora viticola*), Maryborough, Highfields, Allora, &c.; Fruit Rot (attended by the presence of *Tubercularia acinorum*), Cavara, Biggenden, and Brisbane.

Pineapple.—Internal blackening of Fruit, Zillmere district; Pineapple Disease, Nundah.

Tobacco.—Leaf Mould (caused by *Peronospora*), Brisbane.

Potato.—New Bacterial Disease (caused by *Bacillus vasculorum-solani*), Toowoomba, Highfields, and Milton; Leaf Disease (caused by *Macrosporium solani*), Allora; Tuber Scab (caused by *Oospora scabies*), Toowoomba; Tuber Pimple (caused by nematodes, *Tylenchus*), Toowoomba.

Tomato.—Fruit Rot (origin uncertain), Brisbane.

Sugar-cane.—Leaf Freckle (caused by *Cercospora Kopkei?*), Bingera and Childers; Gumming Disease (caused by *Bacillus vasculorum*), Bundaberg; Fungus Spawn-threads on rhizomes, Daintree River.

Maize.—Maize Smut (caused by *Ustilago maydis*), Toowoomba district.

Wheat.—Bunt, or Stinking Smut (caused by *Tilletia foetens*), Darling Downs; Rust, Darling Downs.

Sweet Potato.—Tuber Rot, Brisbane; unproductiveness of plant, Bundaberg.

Banana.—Fruit Rot No. 1 and Fruit Rot No. 2, Blackall Range; Fruit Scab (caused by *Glœosporium musarum*), Bundaberg.

Coffee.—Blackening of Fruit, Cairns district.

Onions.—Leaf Disease (caused by *Peronospora schleideniana*), Allora.

Cabbage.—"Damping off" (caused by *Peronospora parasitica*), Toowoomba and Brisbane.

Melon.—Gradual dying off of plants without fruiting, Zillmere district.

Sunflower.—Leaf Rust (caused by *Puccinia helianthi*), Brisbane.

DISEASES IMPORTED.

Both apples and pears affected by "Scab" or so-called "Black Spot," caused by a fungus (*Fusicladium dendritionum*), continue to be imported from the southern fruit-growing districts, especially those of Victoria and Tasmania. Oranges and lemons, also affected by "Black Spot" or "Brand," frequently arrive from New South Wales. These disease-bearing fruits finding their way into our local markets are afterwards widely distributed throughout the colony. The disease mentioned as occurring upon citraceous fruits received from New South Wales, formed the subject of a special memorandum to you, that, being communicated to the Press, caused growers of oranges and lemons to search their orchards with a view to discover whether or not it had already become established in Queensland. The investigation so far has, however, not resulted in the discovery of this citraceous disease within the limits of the colony.

Coffee-leaf Disease (*Hemileia vastatrix*).—Public attention having lately been directed to the restriction placed upon the introduction of coffee to be used for seed purposes, from countries in which the Ceylon Coffee Disease is known to exist, the position taken up by the Entomologist with regard to such importations, though already forming the subject of a special memorandum, may be here set forth, to the end that it may be manifest that the measures of restriction referred to are amply justified. With such facts (then) regarding the history and occurrence of the Coffee-leaf Disease (*Hemileia vastatrix*) as are at his disposal, it has been stated as his opinion that the introduction of the seed of this plant, from a country in which this malady of coffee is prevalent—*e.g.*, India, Java, Ceylon, Eastern African Colonies, &c.—is attended by considerable risk. A certificate, even, to the effect that the seed in question is from an estate free from the disease, scarcely goes far enough in establishing the fact of its not harbouring the germs of the malady, unless it emanate from a person properly qualified for issuing it, and record also, as an additional fact, the non-occurrence of the disease in the district wherein the estate where the seed has been grown is situated. Coffee-leaf Disease occurring on a plantation has been overlooked, whilst as yet it has not become general, and thus such a plantation has been pronounced free from its presence, though the contrary is the case. Moreover, the spores of the fungus casually related to it become readily detached from the leaves upon which they have originated, whereupon they may be borne a long distance by the wind, and so may exist in places where their presence was not anticipated, whilst the latter may in turn serve as fresh centres for distributing the disease. Moreover, these spores have a very persistent vitality, maintaining their vital characteristics during many months. Therefore a parcel of coffee-seed, or the packing connected with it, even from a nominally clean estate, may serve as the medium of the introduction of *Hemileia vastatrix* to a country in which it was previously non-existent. This was the experience of Fiji, and it is believed also was that of British New Guinea. At all events the seed, if granted admission, should be treated as if liable to convey the disease; it should be subjected to the action of a powerful fungicide, and, the old packing having been meanwhile burnt, it should be put into new packages. Moreover,

it is expedient, in the interests of successful coffee-growing in Queensland, that the right of introducing coffee-seed from a country in which leaf-disease is known to exist should alone be exercised by this Department, and should carry with it the condition that the seed be suitably disinfected on arrival, and grown in close quarantine for not less than twelve calendar months.

LEGISLATION.

Although it is considered that the existence of a strong public sentiment in favour of the prosecution of vigorous personal procedures would be the best safeguard against the introduction and dissemination of plant pests and diseases, and at the same time be the most potent incentive towards effecting their repression, there are yet grounds for concluding that, until this has been evoked, much good in this direction will result from the recent inclusion amongst the statutes of the colony of "*The Diseases in Plants Act of* 1896," whereby co-operation for dealing with the matters alluded to is secured, especially so if the mode of administering this enactment be as prescribed in the Regulations recently recommended for adoption by the Board constituted in accordance with its provisions, and of which the Entomologist has been an official member.

FIELD WORK.

Official visits for the purpose of locally inquiring into the origin and nature of plant ailments have been made to the Allora, Toowoomba, Bundaberg, and Zillmere districts. These visits have also afforded the opportunities for inspecting field and garden crops generally, and for imparting instruction concerning insect pests and related subjects, as well as that bearing on the best measures for coping with them.

During the year also, meetings, held at different centres in the colony, were addressed on the topics having reference to matters of local interest—viz., (1) the Fungus Enemies of Cereals, (2) the Fruit Fly, (3) the Potato Disease, and (4) the Maize Smut. These lectures were listened to by large and attentive audiences, and extended notices of them were circulated by the Press.

INTERCOLONIAL FRUIT-GROWERS' CONFERENCE.

As an official delegate, the Entomologist was privileged to attend the late Brisbane meeting of the above organisation to read a paper at one of its meetings on the set subject of "Insect Friends and Foes," and to take part generally in its deliberations. He also submitted for the consideration of this Conference the question of recommending to the different Australasian Governments the expediency of enacting similar legislation for preventing the introduction of plant enemies and diseases, and of taking steps to facilitate the obtainment, by agriculturists and horticulturists alike, of insecticides and fungicides of standard composition. This action led to the Conference unanimously adopting resolutions in favour of the procedure suggested.

LIBRARY.

The reference library connected with the Entomological Branch of the Department has been enriched by the purchase of twenty important publications relating principally to plant pathology. The many applications from time to time made for information relating to systematic entomology, as well as the absolute necessity for determining correctly the precise relationships of the numerous insects comprised in the official collections, will, however, require the acquisition of several additional works, principally relating to this department of entomology, which is as yet but poorly represented in the works that it already contains. It is desirable also to further add to the list of works of periodical issue that it now receives.

COLLECTIONS.

The collections of economic insects, and of representatives of the different groups included in the Order Insecta, have been largely increased during the year, notwithstanding that little personal attention could be bestowed upon their augmentation. This result has been largely due to the system of purchase having been inaugurated. In fact, the results that have been thus obtained justify much more frequent resort to this most economical means for enriching the official collection than has hitherto obtained, especially when regard also is had to the fact that some important orders of insects are as yet almost unrepresented therein.

This opportunity may be also embraced for acknowledging the indebtedness of the collection to the liberality of many private donors, amongst whom may be especially mentioned Dr. T. L. Bancroft, Dr. J. Turner, Mr. R. Illidge, and Mr. F. P. Dodd.

ARREARS OF WORK.

Although the circumstance may be regarded as affording evidence of the growing importance of the public requirement ministered to, and of the value of the services rendered, by the Entomological Branch of the Department, it must nevertheless be acknowledged, with regret, that a portion of the current work of the year has fallen into arrears, notwithstanding much time beyond the limits of the official working day has been bestowed upon it. This remark especially applies to investigations demanding long, uninterrupted attention. It is anticipated, however, that much of this will be overtaken in the near future as an outcome of the action of the Department in attaching to this office a youthful cadet to undergo special training in partial return for services rendered.

HENRY TRYON, Entomologist.

REPORT OF THE DAIRY INSTRUCTOR

SIR,—I have the honour to submit the following Report on the work done by the Travelling Dairy for the year ending 31st May, 1897, together with a brief summary of the duties performed by me during that period:—

The Dairy, after the 31st May, 1896, at which time my last Report was written, continued in operation until the 31st October, when the scarcity of milk, due to the drought prevailing at that time, compelled a cessation of operations. During the time mentioned, seven places were visited, with, I can conscientiously say, the most satisfactory results, details of which are attached.

It is not, it is submitted, necessary to prolong this Report so far as the Travelling Dairy is concerned, for the conditions under which the Dairy worked for the time in question were so similar to those during previous years, that to fully describe them would compel me to repeat much that I have already written on the subject; suffice it to say that up to the last the keenest interest was taken by the people at each place, and, though often visiting a place the second time, the fact in no way interfered with the attendance or detracted in any way from the appreciation with which the work was received.

Apart from the ordinary working of the Dairy, I caused meetings to be convened at nearly every place visited, and, under the principle of striking the "iron while it is hot," addressed those assembled on dairying matters—the founding of factories, creameries, co-operative dairying, &c. As a result of the above, I am exceedingly gratified in being able to state that, at nearly every place visited during the last term, there is abundant testimony as to the good done, by the number of creameries that have been established since the departure of the Dairy, and the apparent desire on the part of many farmers to improve their former methods.

The importance of the fact that, to bring the industry to a successful issue, an export trade must be established, is almost universally recognised by dairymen, and the means towards establishing this are slowly but surely gaining ground.

The weak spots in the present system are, as I have already dealt with in previous Reports, indifferent cattle, bad system of milking, want of aeration, improper treatment of milk, want of winter feeding, housing, &c.

The success which attended the recent shipment of butter to the London market will doubtless stimulate our dairymen towards giving the matters referred to the amount of attention they deserve. The work of the Travelling Dairy was concluded on 29th October, after which date my time was fully occupied in visiting various districts, and addressing meetings of farmers convened for the purpose of instructing them in the advantages of co-operative dairying, and supplying other information appertaining to the welfare of the industry; and I am pleased to be able to state that in several districts I have been successful in inducing the people to co-operate and adopt the factory system of dairying.

The following places were visited in the Gympie district, and a large number of farmers were present on each occasion, viz.:—Gympie, Pye Creek, Cootharaba road, Gunalda, Kilkivan, Brooya, Miva, Gunalda (second time), Gympie (second time), Lagoon Pocket, and Glastonbury. At each of the above-mentioned places the farmers

responded liberally by taking up a large number of shares, with the result that a company has been floated, and a large co-operative factory is about to be established in Gympie.

I also visited Bundaberg, Thornton, and Rosevale on a similar mission.

At Bundaberg a large number of shares were taken up, and I have since been informed that a co-operative factory is about to be established. At Thornton the people were too divided, each person wanting the factory or creamery built at his own door; consequently nothing was done.

At Rosevale my visit was the means of inducing the farmers to start a co-operative creamery. I think you will agree with me in stating that a great deal of good accrues from meetings where a large number of farmers gather together and discuss many matters in connection with dairying, as was the case at all meetings attended by me.

I also visited the following places and gave instructions in cheese and butter making, milk testing, &c., viz.:—North Ipswich Butter Factory, Tiaro Cheese and Butter Factory, Gobongo Cheese Factory, Neusa Vale, and Ferney View. Several other places were visited, and I have answered numerous correspondents from all parts of the colony upon these and cognate matters. I made necessary arrangements for the shipment of butter per the "Jumna" for London, and visited the various factories, giving instructions to several factory managers relative to the packing, salting, colouring, &c., which were appreciated by all but those who consider that they have reached the apex of perfection, and classified and branded the butter for export (sixty-three tons) as an inspector under the Act.

Owing to my absence on leave in the southern colonies from the 11th February to 3rd May, my assistants, Messrs. Winks and McGrath, were sent into the field to give instructions, the former to Rockhampton and the latter to Bundaberg, and I believe good results have accrued from their mission.

Before leaving for the southern colonies I paid a visit to the Darling Downs and ascertained that areas of good land could be procured at low prices, including small areas of Government lands under the Agricultural Lands Purchase Act. This information strengthened my hand, and enabled me to show to those requiring land that large areas were practically unused in this colony and were available for settlement.

While in Victoria I visited several agricultural and dairying centres, and during my tour, spared no trouble in bringing before the notice of the farmers there the splendid opportunities offered to agriculturists and dairymen in Queensland, and on my recommendation a number of farmers visited this colony with a view to selecting land and residing here. Several have done so, and others intend following their example. I am in receipt of numerous letters from those who visited the colony, expressing their appreciation and surprise at what they had seen, and the large area of splendid land which is to be seen not utilised on the Darling Downs and elsewhere. Nearly all intend returning to this colony as soon as more land is available under the Agricultural Lands Purchase Act.

The question may be asked why these people did not take up land. This is easily answered. In the first place, only a few inferior blocks of the Government repurchased lands were left, and the large landowners would only offer outside portions of their properties, so that, under the circumstances, nothing else could be expected, for no landowner would allow farmers to go into the heart of his run.

I feel satisfied that if the Government were to purchase other large estates and subdivide into agricultural and dairy farms, they would readily be taken up and settled upon by Victorian and South Australian farmers, who are crushed out of those colonies by high rents and inferior land.

In my opinion, these southern farmers would be more successful than those from European countries, because they are well acquainted with the Australian climate and the growth of the various products which are suitable for our soils.

During my tour in the south, I visited many cheese and butter factories, with the view to finding out whether any further advances had been made in the dairying industry, but ascertained that we are not behind in the way of modern appliances or

in the manufacture of butter or cheese; but the handling and treatment of milk at the farms receive a great deal more attention than here, which has been to a great extent brought about by the creamery and factory managers rejecting any but carefully handled milk.

It is much to be regretted that we have had two consecutive dry seasons, which to a very great extent detracted from the production or more rapid advancement of the industry in every way, but I hope the lesson taught is one from which we will profit in the future. The past two seasons are only examples of what may occur in any succeeding year, consequently it behoves us to be ready and provide fodder during a plentiful season.

Professor Shelton during last month taught us that a considerable amount of farm products that are being allowed to go to waste on the farm can be inexpensively converted into ensilage, which will keep without deterioration for an indefinite period, and at the present time thirty-five to forty head of cattle are being fed at the Agricultural College on these waste products.

Too much stress cannot be laid on the matter of winter feeding, which must receive more attention than hitherto, otherwise how can we hope to bring the business to large dimensions?

The rapid development of the industry during the last few years must be apparent to all. The output of dairy produce (including bacon, which, to a great extent, is produced in connection with the Dairy) has placed the farmers in a more prosperous position at the present day. Employment is found for a large number of young people who, had it not been for this industry, would be idle or seeking employment in a less remunerative capacity.

The ravages of tick fever in the Northern parts of the colony have reduced the output of dairy produce to nil, and but for that and the dry season in the Southern parts, we would have exported, instead of about £6,000 worth of butter, six times that amount.

The development of the industry, to a certain extent, has been brought about by private enterprise, to which credit is due, for, had it not been for these ventures, I feel safe in stating that there would be no export trade at the present day, and although I strongly advocate co-operative dairying, I never lose sight of the fact that private individuals who have spent thousands of pounds in elaborate buildings and modern appliances deserve a great deal of consideration, and to these people the farmers should feel ever grateful.

It is to be regretted that so much apathy in the matter of co-operation is to be found among the farmers. To bring about success and contentment amongst dairymen, co-operation must be the predominant power. In my Annual Report last year, I maintained that the quality of the butter manufactured in this colony would hold its own against the best brands turned out in the south, and I am now pleased to be in a position to state that my opinion has been borne out by the recent shipment to London, and I feel satisfied that the quality will improve each year, as the farmers adopt a better system of feeding and treatment of cattle.

Our cheese should be equally successful in the London market, and our factory managers are to be congratulated on the excellent quality of the cheese now placed on our local market.

At the Show of the Royal Agricultural Society held in Sydney this year, some thirty-six factories, including Victoria, South Australia, New South Wales, and Queensland, competed for a £50 prize awarded to the best sample of butter for export, and having been one of the judges, I find, in looking up the points awarded to each competitor, that the Queensland factories were only a few points inferior to the winners of the first prize; the defects being colour, packing, and moisture; the flavour was, however, almost equal to the best sample shown. Nearly all other factories competing had milk specially treated for this competition, whereas the Queenslanders had to be content with the milk supplied in the usual careless manner.

Now that an export trade is assured, it should give confidence to the people of this colony that there is money in milk, and that we are no longer dependent on our local markets to absorb our surplus produce. With the aid of the magnificent cold storage which is to be found in the metropolis, we can hold over sufficient butter to

supply the winter demand, and a glut at certain times will no longer prevail. We have, moreover, no need to fear our markets being glutted with southern supplies, for when we get into a good system of working we can produce milk cheaper than any country in the world.

Great alarm was spread among our farmers by an article in the Press that a large shipment of Victorian butter had been returned—"no market in London." This was not, however, the case, for there was, and always will be, a market, but not at prices that were then obtainable in Victoria; in fact, the shipment should not have been made at all, because butter was wanted to supply the Victorian demand. Owing to the dry season which prevailed in the southern colonies at that time, and the great demand in South and West Australia, supplies fell off very rapidly, and prices reached as high as 1s. 5d. per lb., with the result that the shippers found that they could do better than sell at 9d. or 10d. per lb., which was the ruling price in London at that time, hence the reshipment to Victoria.

In my opinion there is no need to fear a glut in the home market, and, if such were the case, we would not suffer to the same extent as Denmark, where the cost of milk production is so great.

As regards the exportation of cheese, before we undertake this business we must be in a position to produce milk at about 2d. per gallon.

I wish to draw attention to the miserable way in which the cream is being carried by our railways. During my travels I have taken particular notice of the way in which our dairy produce is conveyed to market, and I think that some better means of transit is urgently needed. The cars that are now being used are most unsuitable for the purpose. On one occasion, when travelling with one of our legislators, we were delayed at a railway station for a few minutes, and in this gentleman's presence I opened one of the cars in which cream was being conveyed to Brisbane, and I feel satisfied that I am within the mark in stating that the temperature inside this car was up to 100 degrees Fahr., and that the odour would contaminate any dairy produce in a few minutes. On several other occasions it has come under my notice that cream has been carried in the guard's van with game, such as dead fowls, hares, and live cats, &c. Again, I have noticed at the various railway stations cans of cream are to be found lying on the platform for hours exposed to the sun without the slightest protection whatever. These matters are mentioned because they are of the greatest importance, and detract considerably from the welfare of the industry.

Shipping Butter.—The arrangements were not so satisfactory as could be desired, because factories were unable to load their butter in Brisbane. In one instance twenty-five tons had to be carted by road from Brisbane to Eagle Farm. The delay attending this shipment would have had a serious effect on the butter had it not been of excellent quality. These defects could be avoided were cold storage provided for the reception of butter, in close proximity to the wharf. As regards future tuition in dairying matters, I beg to suggest that the Instructor be authorised to pay periodical visits to all creameries and factories, and, when necessary, give instructions to managers, and convene meetings in the various districts, where farmers could attend and discuss all matters in connection with dairying.

With regard to breeding and feeding cattle, this must be shown by practical demonstrations, as 90 per cent. of the farmers at the present day cannot be shifted from the old groove by any other means. This could be brought about, it is suggested, by the establishment of a farm where a good herd could be kept, and a correct record of each individual breed taken, together with particulars of the cost of feeding, producing, and manufacturing the article, which work, if judiciously carried out, should leave a large margin of profit. At this dairy, experiments should be carried out in pasteurising and sterilising milk and cream, and various other experiments, which could be afterwards imparted to pupils and others interested.

In conclusion, I wish to state that my many thanks are due to the members of the various committees and members of agricultural societies for the valuable assistance rendered me in carrying out my duties.

JOHN MAHON.

Summary of Operations in each District from 8th June, 1896, to 29th October, 1896.

Place.	Dairy Operating between the Dates.	Total Gallons of Milk Operated on.	Gallons of Milk into Cheese.	Pounds of Cheese made.	Gallons of Milk required to make a pound of Cheese.	Gallons of Milk into Butter.	Pounds of Butter made.	Gallons of Milk required to make a pound of Butter.	Number of Pupils.
North Pine	8 June to 18 June	546½	265	279½	0·94	281½	89½	3·14	12
Terror's Creek ...	25 June to 6 July...	757	455½	511	0·89	301½	115¾	2·60	15
Kilcoy	17 July to 29 July	733½	310	325	0·95	423½	164¼	2·57	12
Neurum	5 Aug. to 27 Aug.	538	288	285	1·00	250	90	2·77	12
Delaney's Creek ...	3 Sept. to 17 Sept.	601½	211	219	0·96	390½	147¼	2·65	13
Samford	28 Sept. to 8 Oct....	789½	248	270½	0·91	541½	195	2·78	13
Redbank Plains ...	19 Oct. to 29 Oct....	312½	208	199	1·04	104½	29½	3·54	10
		4,278½	1,985½	2,089	0·95	2,293	831¾	2·75	87

REPORT OF THE OVERSEER OF THE STATE NURSERY, MACKAY.

SIR,—I have the honour to submit my Report for the year ending the 30th June, 1897 :—

SUGAR.—Cane-growing continues to occupy the greater portion of the operations at this Nursery, for, notwithstanding the drought that prevailed during the past two years, the farmers are still extending their cane cultivation, and the demand for plants is consequently increasing. The rapidity with which plant cane is cleared out of the Nursery is astonishing, but it may be to some extent accounted for by the inferiority of the plant cane available in the neighbourhood outside the Nursery. The distribution of cane plants was commenced on the 25th February, but applicants were forthcoming on every preceding day of the month. After a few days it was necessary to postpone distribution until the 16th March, and by the 20th of that month all the available cane had gone, and there were many farmers who were unable to obtain their requirements. None of the canes in the Nursery, excepting those last imported from New Guinea, made much progress until the latter end of January, after which, however, they grew rapidly, and by the middle of March had made fine cane.

Iduari.—This cane, which up to the last season has thriven so well and given such large crops, now appears to be dying off, not only here but also with farmers around who had it in cultivation. This is to be regretted because it promised so well; it has, however, been withdrawn from distribution, none having been sent out this year. On scrub soil it seems to do well, and I have been informed that it has succeeded in sandy loam.

Oraya still keeps up its reputation for growing and for sugar, but it is too thin in the cane to please the farmers, who say it requires too much handling to obtain the same weight off the land as compared with others.

Batoe is as yet a sterling cane, and, unless it exhibits, in the future, faults at present unseen, it may be considered a standard cane.

Chenoma is a good cane, and, were it as high in sugar as the Batoe, would be very valuable. It is, however, in some demand, and Mr. McCreedy has planted a large quantity.

Kewensis still exhibits all the points of a first-class cane. It has been found that this cane is slow in growing if planted in the cold weather. It has been known to lie in the ground for five months and then come up in places where the eyes had not been destroyed by the wire-worm (*Agriotes*), not the British species (*A. leneatus*), but a variety resembling it, and by which much harm has been done in this district during the past season. It is evident from the opinion of correspondents that Kewensis requires a greater heat than many of the other canes; in fact, the farther North it is cultivated the better it will prove to be. It requires fifteen months to mature, and it is in the last two or three months of its life that it makes the cane. Planting in August or September would bring it in at the end of the crushing here.

New Guinea Canes (last importation).—These were planted in January and February, 1896. Little can be said of them in this Report, because their sugar qualities are not yet known, but it can be written that with few exceptions they are first-class growers. Of the exceptions, one showed signs of rust, and a few are thin in the cane, but the number of canes to the stool is sufficient to make up the weight; but this class of cane, as before remarked, requires too much handling to please farmers. The majority of these canes would have been willingly accepted for planting this season, but as they had not been tested, none were distributed.

Lahaina.—This cane, which reached the Nursery from Honolulu, where it is understood that it is in much favour, has not done much good up to the present, but it is in poor ground, and may improve when planted in better soil.

Of the other canes, Striped Bamboo, sometimes called Striped Gingham, and Merah, are standard canes. Louzier, also called White Bamboo, and a cane I have called Yeppoon, can be classified as good.

MANURE EXPERIMENTS.—Upon the sixteen plots sown with artificial manure there is visible a considerable difference in the cane as compared with the unmanured; but until the cane has been harvested and results determined, nothing definite can be reported. Of these canes there will be a large amount available for distribution.

COFFEE.—The cultivation of coffee has at last been practically commenced in this district upon a commercial scale. For many years isolated trees and small patches have been cultivated in a haphazard way, and Mr. Costello has for some years had a small plantation; but until the Queensland Coffee Estate Company commenced operations upon a large scale, nothing had been done to lay down a plantation of this profitable plant upon business principles. The result of the action of the Coffee Estate Company has been that a constant demand has set in for seed from the Nursery, and for information relative to the cultivation. To afford general information upon the latter point, I wrote an article on "Will Coffee-growing Pay," which duly appeared in the *Mackay Standard*.

RUBBER.—Notwithstanding the drought of the last season, the rubber plant, with the assistance of irrigation, did well, and the Para trees are now a good size. The Ceara does not do so well in this locality; one of the two plants that I had died last winter, but the survivor has thrown up a shoot 15 feet long, which would soon make a good-sized tree in a more suitable place. Para rubber is more easily grown and is more productive than the Ceara; is hardy here, but without doubt would make greater progress further North.

JAPANESE PLUMS.—Botantin and two of the numbered trees gave good crops last season.

GRAPES.—A good crop was obtained. The poorer varieties are being taken out, and their places are being filled with better sorts. The Royal Ascot is our best table grape, and the Le Noir for wine. The foxes were very troublesome, and took a great part of the crop.

LITCHI.—A good crop appeared, but it was nearly all destroyed by the fly, but this damage was not visible until several days after the crop had been gathered, no puncture appearing.

SPONDIAS DULCIS.—This has grown into a large tree, but bore no fruit this season.

MAMMEA TREE.—It is with regret that I have to report that this tree succumbed during last winter. This plant, the only one in the Nursery, was introduced from Rio de Janeiro, and grew well during the summer. It is a very desirable plant to have, not only on account of the fruit, but also for the foliage, which resembles the *Magnolia grandiflora*.

PLATONIA INSIGNIS.—Introduced with the Mammea; promises to thrive.

AVERRHŒA CARAMBOLA is growing well. This also came from Rio de Janeiro, although a native of Ceylon. It is unfortunate that we have this variety instead of the *A. Bilimba*, which is the better of the two which comprise this genus.

STAR APPLE.—This has grown into a fine tree, is in full flower, and if circumstances are favourable fruit is expected from it this year.

ADHATODA VASICA is doing well.

KOLA NUTS.—These died last winter. There is, it is understood, a species or variety which is a freer grower than the *Acuminata*, which would probably thrive at Mackay.

MONSTERA DELICIOSA.—This does fairly well, but apparently the soil at the Nursery does not quite suit it, for in the town it does well. Notwithstanding the delicious flavour of the fruit, it is not thought that it will be popular.

SWEET SOP.—Have grown well, and are now in flower.

WALNUT TREE.—This is now making progress, though for some time it showed no signs of growth. It is yet too young to write concerning its future.

MADAGASCAR PLUM.—These trees are now 9 feet high, and nearly as much through. Four of the five have flowered, and two have proved to be males. It is a pleasant fruit, and the tree is well worth cultivating.

BRAZILIAN CHERRY.—Bore fruit last season.

ENGLISH PLUMS AND PEACHES.—These have not yet shown signs of flowering. The seedling peaches bear abundantly, but are inferior to the standard English sorts.

Bael Tree.—These are growing large trees, but have not yet flowered.

Musa Family.—All have been done away with, owing to an attack upon them at the root by the larvae of a beetle.

Figs.—Those sent here as Brown Turkey have turned out a miserable apology for that fine sort; they will be rooted out, as to distribute them would be wrong. The Indian one, Poonab, has not fruited yet, but it is to be hoped it will turn out better than the so-called Brown Turkey.

Cæsalpinia coriaria (Divi Divi).—Have grown well and are now in flower.

Pithecolobium saman (Rain-tree).—Has yearly shoots on, now 9 feet long, but they are evidently not well adapted to resist the wind, as they are growing from the point (east) from which it principally blows.

Aleurites moluccana (Candle Nut).—The trees that were removed, to make room for the artificial manure experiments, were transplanted along the fence near the lagoon, and only one failed. They are in the same line as the rain-tree, but are growing perfectly upright. As these trees grow very quickly, they would make good wind-breaks for coffee plantations.

Acacia Species (Wattles).—Only two of the varieties grew after transplating. *Acacia decurrens* (green wattle), which is the most valuable, is the one that has done best. They were transplanted along the edge of the lagoon about ten months ago, and are growing very rapidly.

Lectures were given by me at the State schools at Mackay, Hill End, and Coningsby, on budding, grafting, &c. The best attention was given at each place, and the instruction was apparently appreciated by both adults and children. Mr. Norris, the head teacher of the Mackay school, requested a number of the elder boys each to write an essay on the subject, all of which I have gone over, corrected, and returned, so that the boys will have them as reminders.

In horticultural matters, many inquiries are made here, and generally I have been able to give the desired information.

Improvements.—The much-wanted weighing machine, sanctioned by the Minister, will be placed in the course of a few days. The attempt to find a supply of well water, as a substitute for the nearly dried-up lagoon, has been commenced, and water has been met with at 11 feet. A curb has been made, put in, and bricked up, and I hope that two or three feet further digging will give a sufficient supply, whereupon connection with the present system of piping will be completed, and all other arrangements made.

D. BUCHANAN, Overseer.

List of Fruits, Roots, Grains, and Plants of Economic Interest growing in the Nursery.

Fruits.

Bahia Oranges
Jaffa Oranges
Indian Oranges—2 varieties, Mozambique and Ladoo
Lemons—Citrus medica, var. limonum
Limes—Citrus medica, var. limetta
Persimmons—Diospyros Kaki, several varieties
Pineapples—Ananassa Sativa, 6 varieties:—Common Queen, Smooth Cayenne, Black Antigua, Brown Sugar Loaf, Reine Pamare, Trinidad
Grape Vines—A large number, some of which will be done away with
Japanese Plums—Prunus Armeniacum, 11 named and several unnamed sorts
Leechee—Nephelium Litchi, 3 varieties:—No Mai Chee, Varhak Yep, Hung Lee
Indian Mangoes—Mangifera indica, 18 varieties:—Kistapal chotta, Khahaureeah, Kachehaee Bengal No. 2, Goa, Bangalore, Fuzree, Feragabonnee, Bahandoorea, Kistapal-burra, Arbuthnot, Gopal Bog, Chuckheea, Alphonsa, Madam, Dalhugny, Langera, Madras
Star Apple—Chrysophyllum Cainito

List of Fruits, Roots, Grains, and Plants of Economic Interest growing in the Nursery—*continued.*

Fruits—continued.

Bael-tree –Ægle marmelos
Figs—Ficus carica, 2 varieties
Passion Fruit—Passiflora edulis, Granadilla—Passiflora quadrangularis, variety Major
Papaw Apple—Carica Papaya, new variety
Puneala or Madagascar Plum—Flacourtia Ramontchi
Monstera deliciosa
Vi-apple—Spondias dulcis
Sweet Sop—Anona squamosa
Brazilian Cherry—Eugenia uniflora
Walnut—Juglans regia.

Plants of Economic and Commercial Interest.

Para and Ceara Rubbers—Hevea guineansis and Manihot glaziovii
Arnatta—Bixa Orellana
Ramie—Bœhmeria nivea
Coffee—Coffea arabica
Coffee—Coffea liberica
Coffee—Coffea maragogipe
Tea—Thea bohea
Cassava—Manihot utilissima: syn. Janipha manihot
Dolichos—Dolichos uniflora
Pigeon Pea—Cajanus indicus
Field Pea—Princess Sophy
Sugar-cane—A large number of varieties, which will likely be reduced
Teosinte—Euchlæna luxurians
Arrowroot—Maranta arundinacea
Sisal Hemp—Agave rigida, var. sisalana
Candle-nut—Aleurites moluccana
Yams—Dioscorea, several sorts
Divi Divi—Cæsalpinia coriaria
Walnut—Juglans regia
Sissoo—Dalbergia sissoo
Rain-tree—Pithecolobium saman
Duranta Plumieri
Orris-root—Iris germanica.

List of Seeds and Plants for Distribution.

Seeds.

Coffee Arabian
Arnatta
Ramie
Tamarinds
Teosinte
Sorghum—A very fine sort
Guinea Grass
Rosella.

Cuttings.

Grape Vine—Several sorts
Duranta
Cassava
Frangipana
Pineapples (6 sorts)—Suckers and plants.

Plants.

Bahia Oranges
Indian Oranges—Mozambique
Indian Mandarin—Ladoo
Seedling Oranges
Seedling Bitter Oranges
Seedling Mandarins
Indian Mangoes (inarched)
Indian Figs—Poonah.

Rhizomes.

West Indian Ginger—In October
Turmeric (Curry-powder Plant)
Arrowroot—White.

Seeds, Plants, &c., Distributed during the Twelve Months ending 30th May, 1897.

Number of Recipients	193
Quantity of Sugar-cane distributed	110 tons 12 cwt.
Number of Cuttings	7,768
Plants and Trees	815
Seeds in packets	50
Seeds in pints	$5\frac{3}{4}$
Seeds in quarts	10
Seeds in bushels	$3\frac{1}{2}$
Seeds in pounds	$92\frac{1}{2}$
Pineapple Plants and Suckers	142
Rhizomes in number	152
Rhizomes in bushels	2
Mango (Indian) Stones	230

Meteorological Report to the end of April, 1897.

Date.	Extreme Maximum Temperature.	Mean Average.	Date.	Extreme Minimum Temperature.	Mean Average.	Rainfall.
1896.			1896.			
1 May	82	75·25	15, 16, 25 May	42	55·10	1·87
30 June	80	71·12	21, 22, 25, 26 June	37	46·10	2·46
9 July	88	70·30	1, 23, 28, 30 July	36	44·16	0·40½
27 August	89	71·9	5 August	34	43·26	0·22
4, 25, 28 September	82	79·8	2 September ...	40	52·14	
31 October...	86	81·5	4 October	52	56·8	0·43
11 November	90	84·27	6 November ...	58	64·0	1·66
9, 18, 22 December	92	89·18	28 December ...	61	68·16	1·33
1897.			1897.			
18, 19, 24 January	95	89·9	11 January ...	63	69·10	7·29
26, 27, 28 February	95	85·5	16 February ...	64	70·9	2·13
2 March	95	86·28	11 March	59	67·17	8·9
15, 29, 30 April	84	81·9	24 April	47	60·10	1·70
Mean average maximum for the year	...	81·4				
Mean average minimum for the year	...	...	...	...	58·10	
Rainfall for the year	...	...	...	...	...	27·58½
Rainfall for the previous twelve months	...	...	...	...	...	76·31½

REPORT OF OVERSEER, KAMERUNGA STATE NURSERY, 1896-7.

SIR,—I have the honour to submit my Annual Report for the year 1896-97.

The weather, as shown in Schedule A, was favourable for most kinds of tropical agriculture. The growth of extreme tropical plants is very much retarded during the months June, July, and August, this being the coldest section of our year, and more favourable conditions than those which prevail are absolutely necessary for most of these tropical plants. It may be possible to fruit the Durian, clove, cacao, mangosteen, and such like plants, but it is very improbable that these could become of economic value with us; we cannot make our nights warmer, or convey the excessive humidity, so necessary to these forms of vegetation, to the atmosphere. There has been considerable inquiry regarding the growth of caoutchouc yielding plants in North Queensland, and I have thought it of sufficient interest to the general public to write a series of articles on that subject, to be published in the *Agricultural Journal*. Coffee culture has also continued to excite the action of a considerable section of farmers and others. I have elsewhere advised you that a handbook should be compiled regarding the treatment (so far as it is at present known) of the coffee-tree as a farmer's staple in North Queensland; so many letters are received asking for information in this regard, that it would seem imperative to do so.

SUGAR-CANE.—The quantity of plant cane distributed from this Nursery during the past year has not been large. The applicants have not been numerous, but this is probably owing to the fact that most of the varieties growing have not been subjected to analysis. The varieties received from British New Guinea by Mr. Tryon formed the subject for a somewhat lengthy report addressed to you on the 11th of March last, and to that I can add nothing except that, since then, three or four varieties have arrowed somewhat freely. As there is no convenience for propagating sugar-cane from seed at this Nursery, some matured panicles were forwarded to you for trial at Brisbane. It may be mentioned that a glasshouse is necessary in which to propagate sugar-cane seed.

The varieties not included in the report above-mentioned were Kew Seedling, Lahina, and others, as follow:—Kew Seedling seems to be an excellent field cane, somewhat given to arch outwards from the stool. The quantity each stool gives is very good indeed, and in every way from the farmer's point of view it promises to become a favourite. Only a few plants have been distributed, as the major portion was planted in the Nursery.

The Honolulu variety, Lahina, promises well. This cane has been known for many years by a few, and there has been considerable inquiry for it. If you remember, Mr. Gibson, of Bingera, introduced these particular canes from Honolulu; only a few plants survived the introduction. These have, however, thriven very well indeed. Some have been distributed, and a considerable number replanted. This cane somewhat resembles the Kew Seedling in appearance, but is hardly so large a stooler. A representative of the Colonial Sugar Refining Company informed me that, in the Southern colony, the variety was liable to disease, but that otherwise it was a good cane.

Moore's Purple.—I did not think much of this variety in my last report, but what has since been told me of its merits for sweetness has decided me to plant a row of it for future analysis. As a cane for the field it has considerable merit; there are plenty of long canes to the stool, but it has a habit of shooting early from the nodes and continually sending up shoots from the roots, in and out of season. The bamboo canes from New South Wales are none of them very heavy croppers, but have a rich and fine appearance in the field. A quantity of these, with the variety known as Lucia, have been distributed. Lucia is not an estimable cane; perhaps it is the worst variety to split that I know of, and is something of a straggler, though a large yielder. There is a large quantity of the variety Batoe available for distribution. This cane seems to satisfy the grower, inasmuch as it is partly a self-trasher, gives abundance of cane, and seems to be hardy. I have not heard of a field of this kind having been crushed, or of what quality the expressed juice is. Perhaps children are fair judges of cane for sweetness; if so, Batoe is certainly a sweet cane: but little appearance of rust; neither borer nor grub has up to the present been noted. From calculations made last year, 40 tons of Batoe can be produced from land such as ours. The cane must, however, be well cultivated to obtain so large a crop.

We have growing seventy-nine varieties of sugar-cane altogether. Some, doubtless, will be found when analysed to be worthless. The Colonial Sugar Refining Company having acquired Hambledon, there will very probably be a chemist attached to the sugar-mill there; and as communication with that estate is now possible from Redlynch by rail and tram, there should be little difficulty in obtaining a correct

analysis of all the canes. I am afraid, however, the last lot of British New Guinea cane will have to remain until next year before a fair analysis could be made of any of them, as they will be too old before crushing commences at the Central Sugar Refining Company's works; and as they are to them new, probably the time required for our work could not be devoted by their chemist.

Citrus Family.—But few of this family seem to thrive even fairly well. All the Jaffa oranges have died, or are nearly dead, from bark-splitting and after-decay of the main stem. Of the other kinds of oranges and lemons which have from time to time been introduced, the Bahia Navel, Mozambique, Seville, and *Citrus auchenglasii* seem to be the most free from disease. Of these, the Bahia Navel gives best promise in its growth, but, when fruit is borne, the fruit fly destroys nearly every individual orange; perhaps, however, the Seville orange may be excluded from this assertion, and it would appear that this enemy cares less for the bitter or sour members of the Citrus family than for the sweeter sorts.

The Sweet Lemon (*Citrus auchenglasii*), which was introduced from South Africa some years ago, has a peculiar habit, the outer branches being decurrent, and it would seem that some of the fruit is thus preserved from the attacks of the fly. As this plant is a seedling, persons acquainted with the true form tell me it lacks the sweetness of the sweet lemon they knew in Africa.

Citrus trifoliata fruited for the first time this year. The fruit is insignificant and worthless as such, intensely acid; but I do not think sufficient attention has been given to this plant for hedgerows; used for that purpose it makes a neat and formidable fence, and seems to be well adapted for garden enclosures. The ordinary rough lemon, perhaps, together with the Lisbon lemon, might be recommended for planting in localities where the land is not required for other crops. I was told that 8s. worth of lemons were taken off one tree in the Smithfield district, which adjoins this. Perhaps this is exceptional, as at the rate paid by the limejuice manufacturer—viz., £2 per ton—that would give one-fifth of a ton (4 cwt.) per tree. In nearly every instance insect or fungoid pests, in numerous forms, attack the trees and fruit of this family. Sometimes it takes the form of a velvety-looking growth, which completely covers the branch, and ends in its destruction. The bark-splitting, mentioned as attacking and destroying the Jaffa oranges, seems to have confined itself to that variety; but mildew, both black and white, in all its ramified abominations, attacks and pollutes, in a greater or less degree, all the family. Hope may be held out to the persistent farmer, who would go in for the careful cultivation of lemons, limes, citrons, and Seville oranges, enclosing his farm with a hedge of *Citrus trifoliata*, and planting a few only of mandarins and cumquats for his own family use; but no one should attempt this system of making a livelihood except those who are determined to succeed, and will devote nearly the whole of their time to the work. If diseases, such as fungoid growth, mildewing, &c., are not attacked with vigour on their first appearance, much afterwork will have to be engaged in, with a still less chance of keeping the citrus orchard clean.

It is perhaps worthy of note that a firm has been established in Cairns, who devote their attention to the preserving of lemon-juice, and, I am told, give £2 per ton for the fruit delivered on any railway in the neighbourhood. There is always a fair demand for Lisbon lemons, and a Cairns merchant was making inquiries for Seville oranges for export a short time ago. The New Guinea variety of this family, brought by myself from that territory, has not succeeded in this Nursery.

Bananas.—The export of banana fruit is still well maintained from the port of Cairns. The variety exported is the Cavendish. The variety growing at this Nursery deserving of special notice is the Mokee from the West Indies, which had not fruited at the time of my last Annual Report, but which has since developed two bunches of fruit. The plant itself is a tall, handsome variety, and produces somewhat large angular fruit, similar to those kinds of Musa which are in some countries called "Plantains." The angles are from four to six on different individual fruit, and the weight about 6 oz. The bunches are medium sized, but would probably increase in size if grown on richer alluvial soil where there is more shelter. It can hardly be recommended for the purposes of export, except as a variety. Some plants are available for distribution.

One of the New Guinea varieties has developed better than was anticipated. I have called this sort "Delena," as it was introduced from the neighbourhood of a village of that name near Yule Island. It is of robust growth, but rather too tall in its habit, bears a fairly sized bunch of fruit, of a pleasant acid flavour, short and abrupt at the apex, the colour of the flesh a rich cream. For its height it seems to withstand high winds fairly well. It might be planted in gardens for both fruit and effect. The opening spadix unfolds colourings of green and purple stripes, which is attractive. Probably, however, as a banana for market it would be despised.

The variety known in Natal as Blackstem has been introduced from that colony, together with a kind under the name of "butter" banana. The Blackstem kind was known to me many years ago. It, as its name denotes, has a black stem, and a rather tall, slender habit; may prove of value from an economic point of view. The "butter" variety I do not know, and it is too soon to form any idea of its merit even as a plant. It may be of value to record that the vessel in which these bananas were transported encountered a field of icebergs in latitude about 47° S., and continued for a week among them.

The plants, I am told, were carefully covered up all the time. It would be simple enough to introduce the following varieties for trial from Ceylon:—

Kolikuthe, which variety is said to have strengthening properties.
Suvandel, which has a sweet perfume and good flavour.
Ambolhouarawalla, which has a long name, and is a long clustered banana, with medicinal properties.

The varieties received from Java, through the courtesy of Mr. D. Patience, have not developed any striking characteristics, and are somewhat like some of the New Guinea kinds. Perhaps I may be allowed to deplore the fact that nearly the whole of the banana industry of the district is in the hands of Chinese farmers and merchants, and they pay the European owners of land £1 per acre rent per annum for the land on which bananas are grown. The ramifications of the mode the Chinese have of disposing of this product in the southern markets should be made a study of, and profited by, by the European. So far as the culture of this, to him, staple commodity goes, he acts in a first-class manner.

Artocarpus incisa (True Breadfruit).—The young plants here were received from the Botanic Reserve, Fiji, in September, 1892, and fruited for the first time this year, 1897. A specimen preserved in spirit was forwarded to you for examination and exhibition purposes. Several of the trees have borne fruit, which is of excellent quality and fair size, so that it will be quite legitimate to endeavour to raise plants for distribution. It may be observed for general information that *all* kind of true breadfruit are not equal in value as a food. The New Guinea variety of *Artocarpus incisa* bears an indifferent fruit, and it has been remarked, I think, before, that the missionaries in that Possession have introduced other forms from some of the South Sea Islands. It would be as well if you could obtain some from Tahiti, as from what I have heard a still better than the Fiji kind grows there. This fruit is perhaps of no value as an economic product for export purposes, but is very valuable to the tropical farmer for household use. In itself it is a very handsome tree, but up to the present has been much neglected in the orchards of North Queensland. The tree is of value in the islands apart from its fruit, the inner bark making a tappa, or native cloth. The milk, which exudes somewhat copiously from the bark and green fruit, is, when dried, used instead of pitch for canoes, and the timber itself, which is light, is used for the "damma," or outrigger of these vessels.

Cacao theobroma.—I am afraid the true conditions for the successful cultivation of Cacao do not obtain in North Queensland. It is quite possible, as has been proved at Hambledon, that the fruit will ripen. The correct conditions for this plant are a regular humid atmosphere, with the thermometer not at any time lower than 70°, and rain to fall every few days. Notwithstanding that the thermometer here sometimes goes down to 43° Fah., our plants are looking fairly well. They were received during my absence in New Guinea late in the year 1892, so that they have been now four and a-half years in this Nursery. Flowers have appeared, and a slight effort was made by one of the trees to fruit but failed, owing, I supposed, to the plant being too young. The trees are mostly in Field 1, Sec. 1, and are well sheltered by the large Sissoo trees. Watering has been resorted to in dry seasons, and a fair amount of growth has been noted, but I think fruit may not be looked for for one or two years. I am unaware of the age of the Hambledon tree, but have seen the fruit. I have written to Mr. Swallow, who will probably be able to give me the age of the tree which has fruited in his garden. In Venezuela, however, it is reported to fruit in its fifth or sixth year, and it will probably be quite that age before it fruits with us. There are many forms of this plant, but I am not aware what variety we are ourselves dealing with.

Spondias dulcis (Otaheite Apple).—Is an abundant bearer; it has borne fruit with us for several years, but as it is so subject to the ravages of the fruit fly, few individual fruits attain the proper stage of ripeness. It makes an excellent jam when the ripe fruit is obtainable, perhaps equal to apricot jam, which it somewhat resembles.

Anona (Custard Apple).—Some varieties brought from Java, and presented to this Nursery by Mr. W. Jack, seem, from present appearances, to be new kinds, but have not as yet matured fruit, so no opinion can be formed of their qualities. The trees are healthy and vigorous, and two of them very much resemble the variety known as "Cœur de Bœuf."

Terminalia catappa (Fiji Almond).—This handsome tree has fruited with us for the first time this year. The plant was introduced from Dalrymple Island, Torres Straits, in 1892, by myself. It seems, from Mr. Bailey's Flora, that it is indigenous to the tropical coast part of Queensland. The fruit of this variety is, however, I think, larger than the one noted. It is useful inasmuch as it will grow in almost pure sand, and affords delightful shade. The nuts resemble the almond, and some consider the kernel equal to filberts. I have noticed them in the South Sea Islands and along the coast of British New Guinea. One variety extends as far south as Townsville.

Mango.—The wild mango, indigenous to New Guinea and brought from that Possession by myself, bore fruit for the first time last year, but I was absent at the fruiting time, and did not taste it. In its own habitat, it grows to a large tree some 60 or 80 feet high, with a base diameter in proportion, perhaps quite 3 feet through, and the stem or trunk remains unbranched for a considerable height. Here, however, the tree seems to have adopted the mode of growth of the common garden variety, and expends the force of its growth into branches a few only from the ground. This may be from the fact that it is here planted in the open, whereas it is a jungle or scrub tree. None of the better kinds of mango have been supplied to this Nursery by the Department. It is a plant frequently inquired for, and I have had to distribute, from time to time, plants which have been obtained in this neighbourhood,

Mangosteen.—The plants of this fruit have not yet attained the height of 3 feet even in the bush-house. In the open, the best of them measures only 2 feet. The seeds of this tree were obtained from Java in October, 1891, and were planted immediately. This is a plant which evidently requires shade and moist heat. In all tropical countries where it has been introduced, it has proved tardy of growth and requires great care. With us this will be augmented, as the thermometer in winter descends to 42° Fah.

Caryophyllus aromaticus.—The clove, introduced from Java, 1895. Two only of these plants have survived. They are still very small, but fairly healthy. As with the Mangosteen, shade and moist heat are required for these plants. Mr. Thomatis informs me that *all* his specimens are dead. It would probably give this spice a better chance if fertile seed were introduced and allowed to germinate here.

Piper nigrum (Pepper).—The seeds of this plant were introduced somewhat later than the clove, and some of the plants bid fair to succeed. It is a creeper, and requires support. As a by-crop it may be useful if it bears fruit. I have been informed that many years ago it was introduced into the Herbert (Ingham) district, but did not bear fruit. There are several indigenous peppers growing in the scrub hereabout, all of which bear abundance of berries, but they are of no commercial value, though they contain decided aromatic properties.

Myristica Moschata (Nutmeg).—All the plants which were planted in the open, notwithstanding they promised well at the start, failed. Some retained in the bushhouse are alive, and will be planted in the scrub adjoining during next year. The wild nutmeg (*Myristica insipida*) is very abundant in our local scrubs, and it would lead to the inference that *Myristica Moschata* can be grown profitably in certain districts of North Queensland. The young plants have been troubled with scale, but this is a matter which can be remedied, and may not prove to be universal.

Kola acuminata (Kola Nut).—I have been somewhat disappointed with this plant, notwithstanding it has grown well and, in the majority of instances, the trees look promising; but no flowers have been noticed. As there are no authorities to consult regarding the kola plant, I am still at a loss to ascertain when flowers and fruit may be expected. There is considerable interest taken in this plant by residents in Queensland, as a so-called kola drink has of late years found its way into the market, said to have considerable stimulating properties. A very agreeable beverage, somewhat resembling cocoa, is made from kola paste.

Vanilla.—This is another plant of extreme tropical countries, which was introduced into the Nursery during March, 1894. Supports for this epiphyte have been formed by planting a grove of Plumeria (the Pagoda tree) and some of the vines are very promising. This, however, is a strictly tropical plant, and for economic purposes can hardly be expected to be of much value with us. It is probable that a more favourable habitat might be found at the extreme end of York Peninsula, as I believe there is no great fall in the temperature there during winter nights.

Cæsalpinia coriaria (Divi Divi).—This plant was introduced to this Nursery from India by seed in 1890, and has grown and developed well. This year there is a very considerable quantity of seed pods, a portion of which it is my intention, with your permission, to forward to London to test the market there, retaining enough to test the Australian market and for seed purposes. It is a small spreading tree, with small pinnate leaves, attractive looking, and, when covered with its curly pods, forms no mean object for ornamental purposes, and as an economic plant would seem to be of no small value. I strongly recommend it to the farmer who has a tract of land unsuitable for more valuable plants, or when he has to contend with nut-grass or other troublesome weeds of that character.

Coffee.—Very considerable interest is manifested by farmers and others in regard to this tropical plant. A very large quantity of seed of the Arabian variety has been distributed since my last Report, mostly to persons who desire to plant from two to ten acres. Some planters desire seed sufficient to plant up to forty acres, but these are few.

It will probably be found necessary to write a pamphlet on this subject, as evinced by present acquired information and experience. Coffee-growing is but little understood in North Queensland. So far as I can ascertain, the circumstances and work connected with coffee culture are quite different with us to those in operation in any other coffee-growing country in the world. One thing which has come under my direct observation, is that very cheap labour is absolutely necessary; white labourers, paid at reasonable rates, would hardly earn their wages at coffee culture. As I have repeatedly affirmed, where aboriginals can be employed in gathering the crop, or where the farmer has a large family of boys and girls, who can be spared from other duties and school for about two months during coffee crop time, then of course it would be different. The reports which have become current regarding the prospects of the coffee industry in North Queensland are, in the main, premature, and cannot be substantiated, as no one has grown coffee for a long period, and thus tabulated experience. To show how the industry has progressed, I may note that during 1894, 110 lb. of coffee seed were distributed to seventy-two applicants, while during the past year 1,303 lb. of seed (some in pulp) were distributed to 116 applicants. This, together with 2,250 coffee plants to six applicants, shows how the industry has increased during the intervening time. This year there will be a considerable quantity of North Queensland coffee in the market, grown mostly from seed derived from this Nursery. Perhaps Mr. Dick, of Cooktown, and Mr. Lewis, of the Russell River, are the first two gentlemen who planted coffee and prepared it for the market in North Queensland. The value of the parchment coffee, as given to me, from samples from this Nursery, is 8d. to 9d. per lb. for well dried sorts. The parchment coffee, or coffee in parchment, loses in the process of milling about 25 per cent. of its weight. This cleaning is necessary before it can be called marketable. North Queensland coffee has a very good flavour. A parcel will be ready for the home market some time during July or August, and I strongly advise that it be sent to London in some vessel where it will be guaranteed a passage away from any contaminating smell, such as hides, wool, or tallow, as the coffee bean is most apt to acquire any untoward odour. Particular stowage in a dry place is absolutely necessary.

Rubber Plants (Ficus indica).—The question of being able to supply a quota of caoutchouc to the world's market has lately occupied the minds of many North Queenslanders. It would seem, however, from the experience of others in different tropical parts of the world, that the cultivation of rubber-bearing plants requires a considerable time, combined with very cheap labour, before results are obtained. I have thought the matter of so much importance that it has formed the subject of a series of articles to appear in your *Queensland Agricultural Journal*. Our experience at this Nursery with *Ficus elastica* has been very promising. Some cuttings, brought from New Guinea about four years ago, have developed into small trees, from which a number of cuttings may now be taken, but I think it were best not to dispose of them except to Government institutions, where they might be multiplied and eventually distributed to the general public. The cuttings strike readily, if kept damp, in the open where there is a little temporary shelter from the sun.

Manihot Glaziovii (Ceara Rubber).—This plant has also thriven with us in a remarkable manner; it will probably become a staple in North Queensland if rubber is cultivated at all. All that has been written about its rapid growth in other countries obtains here. It also seeds at quite an early age, and the seeds grow as they fall from the parent tree, fully indicating they are in a suitable habitat. This tree may be propagated from cuttings as well as from seed. A quantity of either will shortly be available for distribution.

Rigo Rubber.—The Government Secretary of British New Guinea has very kindly sent me some seeds of a caoutchouc-bearing tree growing in the Rigo district of that country. It has not yet been classified botanically, but is evidently a *Ficus*. The seeds have been planted in the bushhouse, and I hope to obtain from them sufficient data upon which to name the tree.

It is quite possible that some of our coast tropical scrub contains caoutchouc-bearing plants. In all parts of the tropical world, discoveries are being made yearly of hitherto unknown plants which furnish marketable caoutchouc.

Hevea braziliensis (Para Rubber).—The seeds of this tree forwarded during the year from your office failed to germinate. They probably had been exposed in transit to some degree of frost, and this would certainly destroy it. I find, however, in looking up authorities, that it is very difficult to introduce this plant by means of seed. It is questionable if *Hevea braziliensis* would thrive with us, its habitat being strictly tropical and where it rains almost continuously; with us the thermometer sinks to 42° Fah., and rain is sometimes almost absent for several months. If an opportunity offers of getting some plants from Ceylon, where it is already acclimatised, it would perhaps be as well to try it.

Fibres.—The cultivation of various fibre plants has been continued. *Agave rigida*, the Sisal hemp plant, has succeeded well, so far as growth is concerned. Suckers from the older plants have appeared from time to time. Some of these have been transplanted, and now a considerable grove of this fibre plant has been formed. Fifty plants were forwarded recently to the British New Guinea Government, and, I have been informed, arrived safely at Port Moresby. Two or three plants of this agave were taken in 1892 to New Guinea, and the Government Secretary of that Possession informs me that one of these has survived, its leaves having attained a length of 28 inches and the plant was healthy. Some hundreds of young plants of *Fourcroya gigantea*, the Mauritius hemp plant, have been forwarded to Thursday Island, in aid of the defences there. The large leaves of this plant have thorny edges which are most formidable, and a grove would be quite impenetrable by troops until after great delay. *Agave rigida* has a formidable spike at the apex of the leaf, and would help to form a good live plant guard to forts or other military outposts. A supply of *Agave rigida* will also be forwarded to Thursday Island when a sufficiency of plants is available. *Bœhmeria nivea* is still growing, but there is little or no demand for the cuttings or seed of this plant. As there appear to be several varieties of this fibre plant growing in India and other tropical countries, it is just possible the variety we have is not the best. So much has been written on the subject of Ramee or Rhea cultivation and extraction, that the subject is quite confusing. I had the honour to forward to you about a month ago some samples of fibres produced at this Nursery from a variety of plants, for the purpose of exhibiting them in the International Exhibition; these will give you some idea of their relative strength and values. I think it would be advisable that some of the islands off our Northern coast should be planted with *Musa textilis*, as well as with cocoa-nuts. Some *Fourcroya gigantea* bulbels were sent to Mackay some time ago with this end in view, and could now be supplemented with a quantity of *Musa textilis* plants. Sites would have to be chosen where the danger of fire does not exist, as that would be fatal, but as provision for this is doubtless made in the case of cocoa-nuts, there should be little difficulty. A plantation should certainly be made where locations of natives are permanently made on the mainland, or on the islands.

Elæis guineensis (West African Oil Palm).—A small quantity of the first fruits of this palm were sent to you last month for exhibition purposes at Brisbane. These palms were introduced to this Nursery from Sierra Leone as growing plants in September, 1890. A few only of these survived, but those that have lived have thriven, and at the present time have a magnificent appearance, one plant bearing fruit last year for the first time. It is a monœcious plant; but most of the trees bore only male flowers last year; this year both male and female flowers are apparent. A number of seeds have been planted in bush-houses, but I am doubtful if they will germinate, owing to the probability of their not being fructified. Much stem has not been yet developed, but the palm is very handsome in all its stages of development. I am perhaps not over sanguine in thinking that the introduction of it by this Department was a wise step, and likely to contribute to the agricultural wealth of North Queensland to a very great extent. The promise is very good indeed. As an ornamental object it could hardly be surpassed. Some of the leaves are over 15 feet in length. It is said the palm reaches 40 feet in height. The value of the oil from this palm imported into Great Britain reached, in 1860, to nearly £2,000,000.

Ginger.—There has been but slight demand for ginger, the preference being for the Chinese variety, which has a larger and softer rhizome than the Jamaica ginger introduced two years ago. There will be a considerable quantity of this latter variety available for distribution about August or September next. As I have before reported, our soil is hardly suitable for obtaining large crops of this spice, and I question whether it is wise to unearth them annually, as fragments left after digging last year's crop seem to grow equally as well as those uprooted and replanted.

Turmeric.—Much attention is not given to this plant by the public, which resembles ginger very nearly. I noted an insect which bores into its stem and descends to the root before the latter is sufficiently old to take out of the ground. This borer does not seem to attack the root itself, but only the stem. Some specimens of the animal in the worm stage have been sent to Mr. Tryon for his report. This is the first year it has been noted. There will, as usual, be a quantity of turmeric roots for distribution in a month's time.

Yams.—The people of Queensland do not seem to care much for this vegetable, and a considerably less area has this season been devoted to their growth. No new varieties have been added, and my former remarks on them will apply. It is probably owing to the length of time it takes for the tuber to mature that causes the public disinclination to this plant. The Chinese almost invariably plant a few of what seems to be the Viti variety in their gardens, but they are *workers* and need strong food.

Teosinte is perhaps the greatest favourite with farmers; it certainly yields large crops of stalk, but does not seem to be relished by our horse.

Kaffir Corn.—This I consider to be the most valuable of the sorghums. As a green food for stock it is well liked. The seed can be utilised in a variety of ways, both as poultry food and when ground as an adjunct to wheaten flour. The Kaffirs make a beer from the grain, and it is much liked by them. It is very fertile, but the seeds do not remain long untroubled by weevils or insects of a like nature.

Guinea Grass.—This large panicum has spread itself fairly well over a large area in this neighbourhood, but will not stand constant feeding; it is doubtless much relished by all kinds of stock.

Red Natal Grass.—This grass is simply a pest to cultivation; its winged seeds fly everywhere, and when alighting on arable land seems sure to grow, and grow into dense masses. The appearance is very charming, particularly when it has just panicled. Stock are fond of it in its young stages, but are shy of it when in panicle; this is probably owing to the fluffy nature of the exterior of the seeds.

Texas Millet.—There has been no demand for this grass, as it requires cultivation; it springs up annually with us, being self-sown in various fields.

Permanent Improvements.—The seedroom and office in course of erection at the time of my last Report has been finished, and the value of it is very much in evidence, particularly at this season of the year when the coffee-drying is in progress. Planting trees by roadsides has been continued, and in course of time these will form attractive avenues. The work of building culverts and bridges over the gully, which runs from south-west to north-east and crosses several roads in its course, has been completed by Nursery labour.

Permanent Improvements required during the Coming Year.—A supply of cement should be sent to be used in making substantial floors beneath new seedroom and office. The Nursery labourers could do the work; it is urgently required, particularly when pulping coffee.

Caretaker's Cottage.—An addition of two rooms and kitchen should be made to the caretaker's cottage at Newlands to enable a married man to take the position of caretaker comfortably. This could be done with but slight expenditure. I have asked Mr. Tills, of Redlynch Sawmills, to give me an estimate of the cost, which will be forwarded to you in due course.

Drainage.—The necessity for a dry walled drain through Field 1, Section 1, Field 2 of Section 2, is much needed, both for utility and appearance. This will be commenced during this year if any labour can be spared from other work.

Horse.—Our horse, used for ploughing, should be replaced by a younger and more active animal. The present draught horse has worked with us over six years, and was old when purchased. A riding horse should also be supplied for the overseer's use, together with saddle and bridle. Through the kindness of Mr. A. T. Clerk, an old animal of his was lent and has been used for Nursery work.

A supply of botanical and other books of reference is much needed. The overseer is often questioned on subjects that do not appear in the few works he has, and these should be supplemented, so that reliable information may be given when required.

Visitors.—Not a few visitors of note have from time to time visited the Nursery, the Minister for Agriculture being the most prominent. It is hoped that his visit will result in many improvements, particularly in the way indicated to him on the ground.

General.—The year has been marked by the flowering and fruiting of several forms of plants for the first time, a result very much appreciated by the overseer. Considerable quantities of coffee seed have been distributed. The subject of coffee-growing has excited considerable interest, and in a lesser degree this may also be said of rubber-producing plants. The subjects are dealt with elsewhere in this Report. The Nursery could be extended if more labour were available, as we have some available land yet untouched. The nucleus is here for a very much larger establishment, and the necessities of the district seem to warrant an extension, particularly in regard to sugar-cane. The many varieties brought by Mr. Tryon from British New Guinea are as yet unknown as sugar-producers. The advent of a tramway from Cairns to the various sugar-mills will, perhaps, enable the overseer to have each variety analysed. The district generally is in a better frame for advancement than, perhaps, at the time of any former Report.

SCHEDULE A.

Weather Report.

Month.	Mean Maximum Temperature.	Mean Minimum Temperature.	Rainfall.	Days.
1896.				
May	79·0	62·5	4·010	8
June	76·6	59·4	0·035	1
July	75·9	57·9	0·130	3
August	76·5	77·8	1·158	8
September	80·3	54·6	1·114	6
October	78·7	63·1	1·070	9
	Approximate.			
November	84·0	69·4	3·550	11
December	88·6	71·5	1·246	13
1897.				
January	86·6	74·0	6·917	19
February	87·0	76·0	6·585	15
March	86·2	71·6	12·250	14
April	80·7	65·3	4·997	13
May	80·0	62·4	2·315	3
June	77·9	66·5	5·061	17

SCHEDULE B
Seeds and Plants Received.

Month.	Name of Plant.	From whom Received.	Quantity.
1896.			
May	...	...	Nil.
June	...	...	Nil.
July	Sapidus Soponaria	Department of Agriculture, Brisbane	Packet of seed.
August ...	Coffee	Mackay State Nursery	24 plants.
September ...	Kaffir Corn	Department of Agriculture, Brisbane	1 lb.
October ...	...	...	Nil.
November ...	Cardamon	Under Secretary for Agriculture	Few.
December ...	Chinchona	Department of Agriculture	Packet.
1897.			
January ...	Java Plants	Department of Agriculture, Brisbane	Quantity of seeds.
February ...	Hevea braziliensis	Under Secretary for Agriculture	Few seeds.
March	Sugar-cane (varieties) ...	M. Campbell, Natal	Quantity.
April	Bananas (2 varieties) ...	J. M. Wilson, Natal	12 plants.
May	50 varieties of Plants ...	Natal Botanic Gardens	2 Wardian cases.
June	24 Packets (various) ...	Natal Botanic Gardens	Packet of seeds.

SCHEDULE C

Seeds and Plants Distributed.

Plant name.	Seeds.	Cuttings.	Rhizomes.	Quantity.	No. of Applicants.
Arrowroot	...	...	66 lb.	66 lb.	12
Banana	...	...	...	81 plants	11
Cassava	...	12	...	12	2
Coffee	1,308 lb.	...	...	1,308 lb.	116
Coffee	...	...	...	2,250 plants	6
Divi Divi	12 lb.	...	...	12 lb.	6
Date Plum	15	...	...	15	2
Erythrina	...	12	...	12	2
Ficus elastica	...	24	...	24	4
Ginger	...	...	74 lb.	74 lb.	15
Kola Nut	...	16	...	16	3
Mauritius Hemp	2,500	...	...	2,500	4
Rosella	2 lb.	...	...	2 lb.	5
Sugar-cane	...	4 tons	...	4 tons	16
Spondia dulcis	12	...	...	12	2
Teosinte	12 lb.	...	...	12 lb.	6
Turmeric	...	...	38 lb.	38 „	8
Yams	...	...	74 lb.	74 „	15
Various	quantity	quantity	quantity	quantity	22

SCHEDULE D.

SEEDS, PLANTS, CUTTINGS, &c., available for DISTRIBUTION.

Name of Plant.	Seeds.	Plants.	Cuttings.	Rhizomes.
Annatto	few			
Arrowroot	...	...	...	quantity
Abutillon	few			
Bananas	...	quantity		
Bahinia	quantity			
Candle Nut	few			
Cassia Grandis	few		quantity	
Coffee	quantity			
Coral Plant	few			
Custard Apple	few			
Divi Divi	quantity			
Frangipanni	...	...	few	
Ginger	...	...	...	quantity
Indiarubber	...	...	few	
Kaffir Corn	few	...		
Kola Nut	...	...	quantity	
Mauritius Hemp	quantity			
Manilla Hemp	...	quantity		
Orange...	...	few		
Papaw	few			
Pomegranate	...	...	quantity	
Ramie	...	...	few	
Rosella	few			
Sissoo	few			
Sappan	few			
Sissal Hemp	...	few		
Sugar-cane	...	quantity		
Turmeric	...	...	...	few
Tamarind	few			
Yams	...	...	...	few

REPORT OF THE CURATOR OF THE BOTANIC GARDENS.

SIR,—The following Report upon the condition and management of the Botanic Gardens during the past year is herewith presented :—

GENERAL.—The best form of report which can be submitted is to point to the practical improvement in the Gardens themselves during the past year. This is patent to everyone who enters them. Not only have the public appreciated their improved condition by visiting them in largely increased numbers, but visitors from southern colonies, where much larger sums are annually spent on public gardens than here, have been loud in the expression of their admiration of Queensland Botanic Gardens. This was notably the case with the delegates to the late Fruit Convention, who were greatly struck by the beauty of our semi-tropical vegetation, but more especially by the range of climate represented by the plants from different parts of the world which flourished here. They consider that the Gardens provide one of the best advertisements Queensland can have to show the wonderful range of her products.

There is more difficulty in managing botanic gardens so as to give general satisfaction than is commonly supposed. One class of persons demand that it shall be scientific—a collection of plants placed so as to show their affinities in the system established by botanists for their classification; and that plants having no pretensions to beauty shall occupy prominent positions on account of some peculiar property or botanical interest connected with them. Nothing can be more dreary to the average man or woman than such an arrangement. It has been tried in these colonies by one of the most eminent and learned botanists in the entire world, with the result that public opinion proved so strongly opposed to his method as to cause his removal from the curatorship, and yet in the view of purely scientific men his method was the right

one. On the other hand, the immense majority of people who visit botanic gardens want to see beautiful plants and flowers harmoniously arranged. They want to see the plants of other lands than their own placed in appropriate positions, and in company with such other plants as serve to show off their beauty to the best advantage. They want as much variety in form and colour as is consistent with this ideal. This want must be catered for. It is the wish of the people, and during recent years even the very greatest scientific gardens have acknowledged that they exist for something else than to present to the extremely limited number of those who can under-tand it, a classified exposition of the vegetable kingdom. An endeavour is made to arrange our Gardens here on a popular basis, and despite the immense difference between the facilities at my disposal and those afforded in the other colonies, the vastly increased interest taken in the Gardens by the general public is a proof that the effort in a large measure has been successful. Viewing the position critically from an horticultural standpoint, the condition of the Gardens has never been more satisfactory than at the moment of writing this Report, nor have their educational and scientific possibilities been neglected.

Weather.—The weather has been most unfavourable for garden work. The mean annual rainfall at Brisbane is 51·50 inches, but during the year covered by this Report the rainfall at the Gardens only amounted to 31·40 inches. From the 1st April to 24th May, 1897, there were fifty-four consecutive days upon which no rain fell. In July, 1896, the temperature in the Gardens, on the grass, fell as low as 20 degrees on two occasions. On eleven nights in the same winter the lowest temperature recorded ranged from 20 degrees to 25 degrees. Ice was formed here on those occasions. The past summer was remarkably cool, and there was not the usual rapid development of tropical vegetation. The mercury only reached 94 degrees in the Gardens on two occasions—viz., 4th February, and 19th March, 1897, and 90 degrees on twelve days only. Owing to their positions with regard to the river, the Gardens are always two or three degrees warmer at night and cooler in the day than other places in Brisbane where the temperature is recorded. Dew is deposited very heavily in the Gardens during the night, and serves in some degree to mitigate the effects of drought. Even within the range of these Gardens there are several climates; and plants which will succeed in one position will perish in another. This is a matter to which, it is to be feared, the average cultivator does not pay sufficient attention. Accurate records are kept here of temperature and rainfall. Below is a list of the monthly totals of rain which fell here:—

1896.	Inches.	1897.	Inches.
July	3·36	January	2·79
August	0·13	February	3·88
September ...	0·48	March	4·22
October	1·11	April	0·00
November ...	7·32	May	0·64
December ...	5·10	June	2·37
Total for year			31·40

Improvements.—Improvements are always being effected here. All improvements carried out, even the smallest, aim towards one definite plan, and are not effected in a haphazard manner. There is only one labourer to every three acres, and anyone who has ever striven to cultivate three acres of garden in Queensland with one man will be in a position to realise that it is no light task, especially as these Gardens are always supposed to be in "show" order, and to be an example of what scientific horticulture should be. At present a great improvement is being effected in the widening of an old walk so as to make an avenue along which vehicles can pass, thereby doing away with cart tracks across the grass.

Expenditure.—The expenditure of the Gardens during the year under review was:—Labour, £1,552, or 69·47 per cent. of entire vote; Curator's salary, machines, tools, materials, repairs, including water service, maintenance of horses and birds, plants, seeds, manures, paints, hardware, &c., £682, making a total expenditure for the year of £2,234.

Bush-houses, Rare Plants, Etc.—During the past year the bush-houses were really beautiful. Several beautiful orchids flowered during the year, and were placed in a small show-house cheaply made of bamboo. It would be a great boon to the public if a proper glass house were erected as an adjunct to the bush-house, in which rare and beautiful plants could be exhibited at all times irrespective of weather. Our collection of orchids has been largely increased during the year, and although these interesting and beautiful plants require a house to themselves in order to be properly grown, we have been very successful with them.

New Bush-house.—A most useful bush-house for propagating purposes has recently been erected with old material to hand; and, though it has only been in existence a few months, enormous quantities of seedlings, including a splendid consignment of useful and medicinal plants received recently from the Royal Gardens, Kew, have recently been raised in it. Very many plants hitherto unknown to our collection have also been introduced during the year. It is hoped in future to keep the public apprised, through the medium of the *Agricultural Journal*, with the names and properties of plants raised here. For the purposes of this Report, an enumeration of these plants would be simply an unnecessary list of names.

Propagating Houses.—These houses were erected over forty years ago, and afterwards much neglected as regards repairs and painting. They have been thoroughly painted and altered so far as the funds would allow. It is proposed to erect another small house with the sashes taken from the old conservatory.

Nursery.—The Botanic Gardens at Sydney have a most useful adjunct in the shape of a nursery garden at Campbelltown. It costs about half of what this whole establishment does. Its value for raising plants is undeniable, but no such expenditure is desired here. If a reservation of good scrub land close to the railway—say, in the Government reserve at Palmwoods, on the North Coast Railway—were allotted in connection with these Gardens, and a useful man placed upon it, it would be possible to raise quantities of plants most desirable for distribution and exchange, besides procuring a splendid collection of the native plants for which that district is famous, and which are so valuable as a medium of exchange with other countries. This would mark a very distinct improvement in our work. In this way, too, by placing this man in charge of the reserve, the beautiful indigenous palms, ferns, and tropical growth generally of that district would (within this reserve) be saved from extermination. The expense would be the merest trifle beyond the labour of one man.

Economic Plants.—Such useful plants as will grow in this climate are constantly being raised here, and a long border is being filled with plants useful in the arts, medicine, and in domestic life, and I have for distribution very many such plants. I should like to distribute such plants much more largely than I am called upon by the Department to do. Large quantities of shade trees are also available. Experiments with vegetable products on a petty scale in a garden, when the object is to discover whether the plant under consideration will pay or not, are worse than useless, and all theories founded on such experiments are, from a planter's point of view, vague and inconclusive. The adaptability of exotic plants to our climate is thoroughly tested here.

Coffee Cultivation.—Large quantities of coffee seeds and seedlings have been distributed from these Gardens to selectors and others through the medium of your Department. This is an industry which, as pointed out by Mr. Bernays fourteen years ago, will undoubtedly pay with intelligent cultivation. Already a good start has been made in the Cairns district, and at the recent Exhibition there have been on view some samples of excellent coffee in various stages though rather lighter than the Ceylon and Java product. Cultivation and manuring will probably remedy this. The number of books and pamphlets written on the cultivation of this plant would form a small library, and they are continually being added to, so that anyone growing coffee on a large scale (and it is really waste of time to grow such products on a small scale) need experience no lack of information.

Palms.—It is my ambition to have a representative of every known species of this family of magnificent and useful plants in these Gardens. They all succeed here, and their number in our collection has recently been largely added to. In a few years the palms recently planted out will give to our Gardens a very noble appearance, and make them quite unique amongst the gardens of Australasia.

Victoria Regia.—For the first time this rare and beautiful plant has been grown in this colony. It flourished out of doors without any protection except a light net to keep off waterfowl. It flowered on seven occasions, bearing one expanded flower at a time. The largest leaf was 5 feet 8 inches in diameter, and several others were only a few inches less. The infant son of His Excellency the Governor was photographed sitting on one of the leaves, as was also the daughter of the Minister for Agriculture, Miss Dorothy Thynne. The leaf on the latter occasion supported a weight of 51 lb., but it would readily have borne a much greater weight.

Bands.—At the commencement of this year (1897) it was understood that the Headquarters, Police, and Marine Defence Bands would arrange to play on one Saturday and one Sunday afternoon throughout the year. This programme was carried out for a short time, but no band has performed here since 2nd May, 1897. When the bands performed here there was always a most appreciative audience, and it is much to be desired that a way will be found for continuing those delightful promenade concerts.

Bandstand.—A good bandstand is a great need here. Much smaller towns throughout Australasia have fine bandstands. Plans were prepared some time ago by the Works Department, but the cost was very considerable.

A plan has been prepared in this office for the conversion of the present useless structure to a useful stand at a cost not exceeding £20.

Water Supply.—The Board of Waterworks having decided that the water supplied to these Gardens was in future to be measured by meter, the Water Supply Department fixed meters on our three sources of supply.

Prior to this being done, an accurate survey was made of all the pipes in the Gardens, stripping them in many places at an expenditure of considerable labour. It was found that the water-supply system was a perfect "jumble," the pipes crossing each other in the most unlikely places. A map of the Botanic Gardens and Government Domain was then prepared in this office on a scale of 50 feet to an inch, and the courses of the pipes laid down with all taps, valves, &c., clearly shown. Had such a map been in existence from the first, much trouble, time, and money would have been saved. During the past few years such regulations have been made as to wholly prevent useless waste of water here.

The Unemployed.—The unemployed question seems to be practically done with so far as this Department is concerned, as only a few men come here now, and these are usually infirm, or recovering from illness, or very old; in fact, many of them would naturally drift to Dunwich, but seem to prefer this method of getting enough to eat, as being more independent and free from the element of pauperism. The average daily attendance of these men since 1st January, 1897, to date has been 3·6, showing that, taking one month with another, there were only 21 unemployed who worked here; and when this remarkably low number is discounted by irregularity of attendance, trouble of supervision, inexperience, and inability, there is very little left to reckon as practical help. There has been no element of pauperism introduced into this work. Special pains have been taken to ensure their kind treatment, and, so far as the general public is concerned, they cannot be distinguished from other members of the staff if they observe the briskness of movement expected of the latter.

Plant-labelling.—It is impossible to give the exact number, but considerably more than 2,000 labels have been written in this office during the past year. The mere mechanical labour of plant-labelling cannot be readily understood by persons who have not had it to do. In other gardens men are employed at this work constantly. Here it has to be done at odd moments, as a little time can be spared from other work. Every plant which is planted out is distinguished by a metal tag having numbers stamped with steel punches. These numbers are registered, and then the plants are readily identified, even when there is not time to label them at once.

Library.—Since the destruction of my private library by flood it has become necessary to purchase a small working library, for use in the public service, out of my own pocket. During my visit to the southern colonies recently it was noted that the libraries supplied to the curators of the Botanic Gardens there were excellent. The volumes in that of Sydney Gardens numbered over 700. Some time since, on applying for reference books, it was pointed out that there is a library at the office of the Department which could be consulted. Books at that distance are of no use. The time could not possibly be spared to go there every time I wished to consult a book or books. Besides, the necessary books should be available at night, and the library of the Department is only available between the hours of 9 and 4, at which times it could not conveniently be used. It appears from the printed records that there was a good horticultural and botanical library in these Gardens at one time. It is so absolutely essential that it is necessary to return every month a fair percentage of my salary in the purchase of such a library. If the modest sum of £50 were apportioned, it would be possible to procure such books as are indispensable.

Horticultural Information.—Never since my arrival eight years ago have there been so many inquiries on horticultural matters as during the past year. The desired information has been supplied in such a way as to be easily intelligible and practically helpful to the persons desiring it.

Visit to Southern Colonies.—In October, 1896, I visited, in accordance with instructions, Sydney, Melbourne, and Adelaide, and spent some time in the chief gardens of these cities. Ballarat and Dookie were also visited. You have already received a report on this subject under date 11th January, 1897. Fourteen cases, containing about 1,000 plants new to our collection, and many varieties of seeds, were brought back. These alone would repay the cost of the journey. Exchanges were also arranged for, and copious notes bearing upon horticulture in the other colonies were taken. The question of expenditure in connection with the southern gardens was gone carefully into, with the conclusion that, if the sum spent on one of these

gardens annually were available for only one year it would be possible to make vast improvements here. The areas of southern gardens under actual cultivation are practically the same as ours, outlying adjacent lands, which lend an appearance of size, being provided for separately. The curators are well supplied with clerical staffs, and have not to waste their time and energies over petty details. Their officers are well-educated men with considerable knowledge of botanical science, specially trained in their business, and their staffs are ample to fulfil the duties expected of them. The way in which every inhabitant of the southern colonies, even from the remotest districts, showed a patriotic pride in the beauty and excellence of what they styled "our gardens" was very noticeable, and at the same time it was not a little surprising to find the tropical luxuriance of the Queensland gardens referred to in terms of admiration and even of envy by people who had been to Brisbane. Ballarat was also visited. It is a city of gardens. I was most kindly received by the mayor, and driven around the town by the town clerk. The very main street is laid out in gardens, and there are beautiful trees everywhere. Miles upon miles of stately avenues, groves of trees wherever space can be found for them, and public and private gardens of rare beauty. It was stated on the best authority that any attempt to curtail expenditure on this special feature of the city, which gives pleasure to the lowest as to the highest, would meet with such furious opposition from the ratepayers that it could not be carried out. This is mentioned to show that, if Brisbane were similarly beautified in such a way as to give the city a distinctive character, the work would become in a short time a most popular one. The work is ready to the hand of whatever person in power chooses to take it up, and it would remain a monument to his name for generations. Most of the so-called street planting which is seen in Queensland consists in the planting of a motley collection of trees unsuitable either to their surroundings or to each other, and often to both. There are, however, some notable exceptions to this rule.

All the public gardens visited have an abundant water supply laid on everywhere. The supply here is now doled out through three meters.

Forestry.—These Gardens could be made the headquarters of a department or division of forestry for the preservation and natural regeneration of our forests and the development of our immense forest resources. The collection of samples of timbers and their display is most interesting and of value for reference, and is a good illustration of the necessity now recognised by nearly every civilised State for a practical forestry department. Samples of colonial timber have been available in London since the year 1851. An enormous trade is likely to spring up in Australian timbers for street-paving purposes, and, unless measures are taken in the matter, Queensland will be out of it. I reported on this subject at the request of the Minister about eight years ago, when the question of forestry was referred to in the Governor's Speech at the opening of Parliament, and any special report which may be desired can be readily supplied.

Proposed Visit to the North.—On several occasions requests have been received from you to report upon the plants suitable for certain places in the colony. I do not know these places; I have never seen them. No one would ever dream of asking a geologist to report upon the geological features of a country he had never seen. The two cases are exactly parallel.

The mere forming and maintaining gardens in Brisbane, however useful and beautiful, should not be the sole mission of the Curator. Opportunities should be afforded him of seeing the whole colony, of bringing together a collection of its plants, useful and beautiful, and of becoming personally acquainted with the conditions of plant life, soils, &c., throughout the colony. His experience of tropical husbandry and plant life generally would, in this way, be of considerable service to your Department and to the country. I am anxious, in October or November, to make a tour of the colony, especially the Northern portions, and will submit a programme in due course.

Residence.—It is most desirable for the Curator to be located at the headquarters of his work. It is found that the only trial ever yet made of managing gardens with a head whose residence is elsewhere does not work out well. There is a location in the Gardens in which a pretty house would greatly add to their beauty, be infinitely more convenient, and greatly aid the Curator in his work. I have the honour to ask that a residence be erected there. This is a most reasonable request. Every person performing similar duties in ever so humble a way has a residence at the scene of his labours. The Curator has no eight-hour day, and his duties have to be performed in their season, come what may. He cannot afford to neglect a study of the progress

being made in his business elsewhere. He has to contrive and plan when the members of his staff are asleep. Everyone who cultivates the land must do this or go under, and this is especially true of gardens like these with their myriad inhabitants of many countries and as many requirements.

Plant Diseases.—Under this head is included insects, fungi, and weeds inimical to the life of useful plants. A great deal has been written and said concerning the pests which affect plant life in Queensland, but the person who thinks of investing his money and energies in our cultural industries need not be frightened away on that account. Experience in these Gardens gives one the greatest faith in the future of horticulture in Queensland, all the pests notwithstanding. It is safe to say that there is no garden on earth without its enemies to plant life, and good gardening consists in keeping plants in such healthy condition that they do not readily fall a prey to their enemies, and in checking or destroying the latter when they appear. These two operations must go hand-in- hand. Pests are sure to come. The cultivator of the soil may confidently reckon on that, but just as a weakly, underfed animal is more subject to the attacks of insect enemies so with a badly cultivated crop. The practical cultivator has seldom time to study insect life from a purely scientific standpoint, this being a separate and important study. The experience of twenty-five years of active hostility to garden pests, aided by all available scientific guidance as to their life history, has convinced me that in very many cases the want of proper cultivation, resulting in plant starvation, renders the plant a fitting host for insect and fungoid diseases. The pest then takes possession, and is blamed for being the cause of a condition of things of which it is really the effect. The chief scale insect here is *Ceraplastes rubra*, the Pink Waxy Scale. It is the most conspicuous of the scale insects affecting vegetation here, and looks much worse than any of the others, though not nearly so hurtful. With a few exceptions it seems to confine its attacks to native trees and shrubs. This scale is to be found in the bush at considerable distances from any gardens. It thrives chiefly on plants with smooth shining leaves. On mangoes in a badly drained position it thrives, but on the same species on high and drained land it obtains no foothold. This, amongst other facts, seems to bear out the contention that lack of cultivation is often the cause predisposing to disease. All plants sent out from here for some considerable time have been washed in a strong solution of kerosene emulsion. All earth is removed from the roots. An apparatus for treatment of plants by hydrocyanic acid gas is now in working order.

A good spraying machine has recently been purchased. It is highly recommended by the Government Entomologist of Victoria as having done good work there. It shall be made good use of here, and has already proved of considerable value.

In the last Annual Report of these Gardens the subject of nut-grass was briefly mentioned. It is a weed found on alluvial land in several tropical and sub-tropical countries. It is found on such lands in situations as far apart as Sydney and Jamaica. From Central and Western America also we hear of it, but there the wild onion proves even a much greater pest. There is no garden in any land without its pests, and every pest is, like nut-grass, capable of being kept in check if taken in the right way. If the alarmist statements which one occasionally reads in the Press were quite accurate, there would be no Botanic Gardens here at all to-day. They would have been blotted out of existence by nut-grass long ago, instead of which they still exist, are doing well, and are becoming better every month—a very solid refutation to pessimistic prophecies. There has been a kind of tradition in these Gardens that the proper way to get rid of nut-grass was to dig and pick it out. The nut-grass enjoyed the operation, and spread more rapidly than ever; but since the plan has been adopted of keeping the green tops cut off with the Planet cultivator a few inches below the ground, it has dwindled to a puny size, powerless for evil; and the nuts, by which it is propagated, to a great extent become inert. A great point is that nothing could be better for the plants than the continual stirring of the earth to a depth of 3 inches. Briefly, nut-grass is viewed here as an enemy to be defeated, and not to be defeated by. It is a troublesome weed like many others, but here it is and it must be fought. Of course its extension has never been advocated, as has been erroneously stated. That is so obvious as to be hardly worth serious mention. Its existence is simply an incident in horticulture, and it can be well kept within manageable dimensions. It was pointed out in the last Report that nut-grass in an indirect way actually assisted in aerating the soil, and it is a little curious that such a high-class journal as the *Government Agricultural Gazette* of New South Wales published a short time afterwards a long article showing the effect of weeds in conserving and actually increasing the fertility of soils. Every plant in the wrong place is of course a weed, and it is proper husbandry to destroy it. There is not a tenth of the weeds here now which were to be found a few years ago, owing to the rigid enforcement of the rule

that no weed is to be allowed to produce seeds. Nut-grass is said to have been much worse since the flood of 1893. It may have been so in other places, it is not so here. As to theory that it is only found on flooded ground, it was to be found on the unbroken land near Warra when the Industrial Group there was visited, and it is only necessary to light a fire on the higher part of the Government Domain, never broken and never flooded, to get a crop of nut-grass in a few days.

Machines, Etc.—During the past year operations were greatly hampered by the want of proper mowing machines. These could not be ordered until the Estimates were voted, and then one had to be procured from England. This deficiency has now been removed. The lawn-mower is of the type used on golf links in Great Britain, and is especially suitable for rough ground. It is provided with the newly-invented springs to prevent vibration, and is fitted with all the latest improvements.

The want of a manageable punt on the river has often been felt here. Captain Brown, of Brisbane, handed over a short time ago a punt for which he had no further use. On examination it was found that some repairs would make the punt as good as when built, and when finished we will be in possession of a punt capable of conveying 30 to 35 tons of stone, gravel, manure, &c. With care it will last about fifteen years. I have procured all the gravel used here from Moggill Creek in the iron punts kindly lent by the Marine Department, and without extra expenditure. In former times this kind of material was purchased, and cost considerable sums.

Messrs. Smith, Faulkner, and Co. have handed over to me about 100 loads of pulverised charcoal, ex "Duke of Devonshire," for the cartage. It makes an excellent application for land.

New rustic seats have been made for the convenience of the public, and rustic fences erected where required. Work of this sort is now done on the place and with bush timber, thereby saving expense.

Bicycle Gates.--The Gardens are now open to bicyclists, and gates are provided by which they can enter with their machines. Up to the present, the chief causes of complaint have been in the cases of a few people who try to learn to ride upon the narrow walks, and a few young men who make short cuts across the lawns. With care, a person who knows how to ride can use the paths without causing inconvenience to anyone. It is believed, however, that some regulations will have to be made to provide for the free use of the walks by pedestrians on Saturdays and Sundays, when the hustling of ladies and children by rushing bicyclists is becoming a serious nuisance. On steep asphalt grades, where a venturesome bicyclist cannot stop once he has started, a serious accident is more than possible. Special regulations are enforced in any places elsewhere to which bicycles are admitted; they are advisable here.

Kiosk.—The Refreshment Kiosk has been well managed during the past year by Mr. Muling, and is deservedly popular.

Correspondence, Etc.—The number of letters written gives a very inadequate idea of the amount of clerical work to be done here. I have only one man, at £96 per annum, to assist me in the putting up seeds, despatching, receiving, and registering seeds, preparing returns, seed lists, and the hundred and one duties pertaining to an office like this. Correspondence has taken place with nearly every botanic garden of any account in the world. Seeds have been sent them and others received in exchange. Only seeds of actual use to them are sent, and many interesting seeds were obtained in return.

The number of letters copied and registered outwards was 405, many being long communications, and besides these a large number of seed lists, &c., were despatched. Eighty letters were received from your Department, all requiring action, besides many noted original letters forwarded for action, but of which a register has not hitherto been kept, as they were at once returned. A large number of garden minutes relating to the work, &c., have also been written. The man referred to above has to act, in great part, as messenger. It would be of great assistance to have a boy who could acquire a knowledge of shorthand and assist in labelling, &c.

Accounts are kept of all expenditure under separate headings, in order to show at any time exactly what has been done, particularly in previous years. Records are kept of each man's work from day to day, correspondence, exchanges, distributions, seeds, &c., received, by whom sown, &c., &c.

Staff.—The members of the staff are the same as at date of last Report, with one exception. It is practically the same staff which I found here eight years ago. At that time the men worked ten hours daily. Shortly afterwards the hours

were reduced to nine daily, and since the unemployed began to work in the Gardens it has been eight hours daily, stopping at 1 o'clock on Saturdays. They make up for this half-holiday by taking turns to watch on each sixth Sunday, so that the hours of duty are forty-eight hours weekly. Experience will show how far this is desirable with a decreasing number of unemployed. Reduction of hours of labour has been only rendered possible by the introduction of improved machines and appliances, and more systematic methods of work. If the conditions had remained stationary, there would be no alternative with the present staff save to continue the system of ten hours' work daily. That being so, it is very curious that some of the people who have most benefited (the workmen themselves) should be apathetic and non-progressive as regards the adoption of new and improved tools and methods, falling into old grooves whenever they think that vigilance is being relaxed. Such persons are out of place in an establishment which aims to be up to date, and lack of sympathetic interest and co-operation in a go-ahead policy, even when it is quite unconscious, is even more difficult to combat than active hostility.

With this reservation, no trouble ever arises here with the workmen. They do their duty faithfully, although one would like to see enthusiasm for the general good of the Gardens more prominently displayed by some. I shall be only too glad to recommend for increased pay any man who exhibits marked improvement in his work and shows that he is making a study of his business.

Damage by Public.—The damage done to the Gardens by the public (or a section of it) is much less than it has been in previous years. A more sympathetic interest seems to be taken by visitors. Of course there will always be small acts of mischief perpetrated, but even these are not anything like so numerous as formerly.

Proposed Improvements.—Quite a large programme of improvements is in contemplation. These include needed asphalting of walks, improvement of lawns, planting of representative trees, formation of a garden of natural orders specially applicable to the needs of Queensland students, formation of a garden of medicinal plants, &c.

Government Domain.—The expenditure upon the Gardens, walks, &c., of Government Domain was £400; of this sum £371 12s. was spent in wages and £28 8s. in sundries. The area to be attended to has largely increased, and generally there is much more work to be done than formerly. A new piece of ground has been taken in, and many small improvements effected. A general supervision is exercised over the gardener in the Domain; he has hitherto given great satisfaction. His Excellency the Governor takes a keen and critical interest in horticulture, and every effort is made to expend the vote to the best advantage.

I have, &c.,
PHILIP MACMAHON,
Curator.

By Authority: Edmund Gregory, Government Printer, William street, Brisbane.