AGRICULTURE.

TAKEN as a whole, Australasia may be said to be in the first phase of agricultural settlement; indeed, several colonies have not yet emerged from the pastoral stage. Nevertheless the value of agricultural produce, estimated at farm prices, is considerable, and amounts to nearly 50 per cent. of the value of the pastoral and dairy produce. The return from agriculture in each colony for the season 1899–1900 was approximately as shown below :—

State.	Total value of Crops.	Average Value of Produce per acre.	Proportion of Total Value.
	£	£ s. d.	per cent.
New South Wales	5,582,000	2 5 9	22·11
Victoria	6,435,000	2 0 9	25·49
Queensland	1,848,000	4 7 11	7·32
South Australia	2,568,000	1 2 10	10·17
Western Australia	500,000	2 13 8	1·98
Tasmania	996,000	4 8 6	3·95
Commonwealth	17,929,000	2 1 5	71·02
New Zealand	7,318,000	4 4 6	28·98
Australasia	25,247,000	2 8 7	100·00

From this estimate it would seem that the value of crops per acre cultivated is much larger in Queensland and Tasmania than in the other colonies, a fact which is due to the proportionately large area under sugar-cane in the former colony, while in Tasmania the area devoted to fruit and hops, and the higher returns of cereals, account for the high average per acre which that province shows; in Western Australia, where the greater part of the produce consumed is imported, prices are higher than in the eastern colonies, and the small area devoted to the plough returns on an average a better price per acre than in the colonies where agriculture has received greater attention. In point of gross value New Zealand

occupies the first position among the members of the group, the produce of that province having a value considerably in excess of one-fourth of that of all Australasia. Victoria also produces over one-fourth of the total, and New South Wales nearly one-fourth. The value of the principal crops, and the percentage of each to the total production, are given in the following statement :—

Name of Crop.	Value.	Proportion to Total.
	£	per cent.
Wheat	6,382,000	25·3
Maize	1,283,000	4·7
Barley	618,000	2·5
Oats	2,165,000	8·6
Hay	6,010,000	23·8
Grass seed	335,000	1·4
Potatoes	1,378,000	5·5
Grapes	935,000	3·7
Hops	67,000	0·3
Tobacco	18,000	0·1
Sugar-cane	619,000	2·5
Orchards and Gardens	2,024,000	8·0
Green forage	518,000	2·1
Minor crops (other grain, root, &c.)	2,895,000	11·5
Total	25,247,000	100·0

The principal crop is wheat which returned 25·3 per cent. of the total value, hay coming next with 23·8 per cent. Minor crops returned the large sum of £2,895,000—11·5 per cent.—to which, New Zealand alone contributed £2,277,000, the high value of the production in that colony being due to the fact that there is an area of considerably over half a million acres devoted to the cultivation of turnips and other root crops, which are grown mostly as food for sheep.

The average value of agricultural produce per head of population in each of the Australasian colonies during the season 1899–1900 is represented by the figures given below. It will be seen that in the colonies of New Zealand, Tasmania, South Australia, and Victoria the development of agricultural resources has attracted the attention of the colonists to a greater extent than in the other provinces. New South Wales, however, has made a considerable advance in agricultural pursuits during the past few years, and from a position of dependence upon outside

sources for a large portion of its wheat supply, has become almost able to produce enough to meet its own requirements.

State.	Average value per head. £ s. d.
New South Wales	4 3 0
Victoria	5 10 9
Queensland	3 17 6
South Australia	6 19 7
Western Australia	2 19 0
Tasmania	5 10 10
Commonwealth	4 16 11
New Zealand	9 15 2
Australasia	5 13 5

Below will be found the value of the agricultural production of the colonies in the years 1871, 1881, and 1891. Comparing these figures with those for 1899 given above, it will be seen that while the total production of Australasia is now nearly £5,000,000 more than in 1881, the average value per head has declined nearly 25 per cent., and that, as compared with 1891, the value per head is lower. As subsequent tables will show, the great lowering of prices, and not want of productiveness, is responsible for this decline in values. The fall in prices, especially the prices of wheat, was very rapid down to 1895; for the next three years there was a very material increase, but in 1899 they fell again to the 1895 level :—

State.	1871.	1881.	1891.
	£	£	£
New South Wales	2,220,000	3,830,000	3,584,500
Victoria	3,300,000	5,894,000	7,009,100
Queensland	650,000	1,283,000	1,414,000
South Australia	1,789,000	3,283,000	3,045,000
Western Australia	258,000	248,000	380,900
Tasmania	724,000	981,000	1,046,500
Commonwealth	8,941,000	15,519,000	16,480,000
New Zealand	1,955,000	4,650,000	5,518,000
Australasia — Total	10,896,000	20,169,000	21,998,000
	£ s. d.	£ s. d.	£ s. d.
Australasia — Per head	5 12 8	7 5 3	5 14 6

Compared with the principal countries of the world, Australasia does not take a high position in regard to the gross value of the produce of its tillage, but in value per inhabitant it compares fairly well; indeed,

some of the colonies, such as New Zealand, Tasmania, and South Australia, show averages which surpass those of many of the leading agricultural countries. This may be partly seen from the following table, which gives approximately for 1891–95 the value of agricultural production in the principal countries of the world, with the average amount per head of population :—

Countries.	Value in millions.	Per head.	Countries.	Value in millions.	Per head.
	£	£		£	£
United Kingdom	126	3·2	Holland	18	4·0
France	284	7·3	Belgium	29	4·6
Germany	262	5·1	Switzerland	9	3·0
Russia.....	370	3·5	United States	487	7·7
Austria	210	5·7	Canada	33	6·9
Italy	141	4·6	Cape Colony	2	1·3
Spain	94	5·5	Argentina	24	6·0
Portugal.....	18	4·0	Uruguay	2	2·7
Sweden	20	4·9			
Norway	3	1·7			
Denmark	19	8·6	Australasia (1899) ...	25	5·7

Area under Cultivation.

The following figures, giving the total extent of land in cultivation in each of the colonies at different periods since the year 1861, will serve to illustrate the progress which agriculture has made. In this table, and in the others which follow, the years 1861, 1871, 1881, 1891, and 1899 embrace the period from the 1st April in each of those years to the 31st March in the following year :—

State.	1861.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales.....	265,389	390,099	578,243	846,383	2,440,968
Victoria	410,406	851,354	1,435,446	2,116,654	3,155,051
Queensland	4,440	59,969	117,664	242,629	420,746
South Australia.....	400,717	837,730	2,156,407	1,927,689	2,238,240
Western Australia	24,705	51,724	53,353	64,209	186,396
Tasmania	163,385	155,046	148,494	168,121	225,126
Commonwealth.....	1,269,042	2,345,922	4,489,607	5,365,685	8,666,527
New Zealand	68,506	337,282	1,070,906	1,424,777	1,732,752
Australasia.....	1,337,548	2,683,204	5,560,513	6,790,462	10,399,279

The following table shows the increase in area, and the proportional yearly increase in cultivation, in each colony during the period of thirty-nine years under review :—

State.	Increase in area from 1861 to 1899.	Rate of Increase in acreage per annum.
	acres.	per cent.
New South Wales	2,175,579	5·9
Victoria	2,744,645	5·4
Queensland	416,306	12·4
South Australia	1,837,523	4·5
Western Australia	161,691	5·3
Tasmania	61,741	0·8
Commonwealth	7,397,485	5·0
New Zealand	1,664,246	8·6
Australasia	9,061,731	5·4

Thus, although the provinces of Victoria, South Australia, New Zealand, and New South Wales have during this period provided the largest increase in the area of land cultivated, Queensland shows a much greater proportional increase, while agriculture in Tasmania has relatively to population remained almost stationary. Taking Australasia as a whole, it will be seen that the area under crop is now almost eight times as large as it was in 1861. If, however, the land artificially grassed be included, the total will come to 21,953,051 acres, or more than fourteen times the area in cultivation in 1861. A comparison of the acreage under crop on the basis of population, which is afforded by the table given below, may perhaps best serve to give an idea of the progress of agriculture; and it will be seen that, on this basis, the greatest advance since 1891 has been made by New South Wales :—

State.	1861.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales	0·7	0·8	0·8	0·7	1·8
Victoria	0·8	1·1	1·7	1·8	2·7
Queensland	0·1	0·5	0·5	0·6	0·9
South Australia	3·2	4·5	7·5	5·9	6·0
Western Australia	1·6	2·0	1·8	1·2	1·1
Tasmania	1·8	1·5	1·2	1·1	1·2
Commonwealth	1·1	1·4	2·0	1·6	2·3
New Zealand	0·7	1·3	2·1	2·2	2·3
Australasia	1·1	1·4	2·0	1·7	2·3

For the whole of Australasia the increase of agriculture as compared with population is shown in the following table :—

Increase of—	1861-71.	1871-81.	1881-91.	1891-99.
	per cent.	per cent.	per cent.	per cent.
Acreage under crop..... ...	100·6	107·2	22·1	53·1
Population	55·6	43·2	38·1	18·4

Although during the period of thirty-nine years the population of Australasia was nearly quadrupled, the area of land devoted to agriculture increased almost eightfold, and the rate of agricultural progress was more than twice that of the population. This improvement took place entirely during the twenty years from 1861 to 1881, and chiefly during the latter portion of that time; from 1881 to 1891 there was a big decline, the population increasing nearly twice as rapidly as the agricultural industry. During the last nine years, however, agriculture has regained the ground it lost during the preceding period.

The progress in the seventies is what naturally might be expected, as the gold fever had altogether subsided about the end of the first period, and a large portion of the population was seeking employment of a more settled nature than was afforded by the gold-fields. The comparative decrease noticeable in the eighties was attributable to various causes, such as the general tendency, elsewhere alluded to, of the population to congregate in the several metropolitan centres; the difficulty of taking up good land within easy access to markets; and also to the fact that there were large accessions to the numbers of those engaged in other callings without a corresponding increase in the agricultural classes. But the earnest attempts of the State to assist the agriculturist in obtaining land on easy terms, and to benefit him in other ways, coupled with the satisfactory advance in the price of wheat during the three years 1896–98, enabled the industry to overtake the population.

It was ascertained at the census of 1891 that the number of persons engaged in agricultural pursuits in the Australasian colonies was 310,642, of whom 286,272 were males, and 24,370 females. There is every reason to suppose that the present number is not less than 475,000.

In the following table will be found the proportion of land under crop to the total area of each colony, and the same with regard to Australasia as a whole. In instituting comparisons between the several colonies, however, it must be borne in mind that other circumstances than the mere area in cultivation require to be taken into consideration. It would not be fair, for instance, to compare Tasmania, which has

6·95 persons per square mile, with Western Australia, which has only 0·18 inhabitant to the square mile. The table has a value chiefly because it shows how each province has progressed in cultivation of the soil during the periods quoted :—

State.	1861.	1871.	1881.	1891	1899.
	per cent.	per cent.	per cent.	per cent.	per cent.
New South Wales	0·15	0·20	0·29	0·44	1·23
Victoria	0·73	1·51	2·55	3·76	5·61
Queensland	0·001	0·01	0·03	0·06	0·98
South Australia.....	0·07	0·15	0·37	0·33	0·39
Western Australia	0·006	0·008	0·009	0·01	0·03
Tasmania	0·97	0·92	0·88	0·99	1·34
Commonwealth.....	0·07	0·12	0·24	0·28	0·46
New Zealand.....	0·10	0·50	1·60	2·13	2·59
Australasia.....	0·07	0·14	0·28	0·34	0·53

The subjoined table shows the proportion of cultivated area devoted to the principal crops in each province. It will be seen that wheat forms the greatest percentage of the total tillage in Australasia as a whole, and in New South Wales, Victoria, South Australia, and Western Australia. Maize and sugar-cane are the principal crops in Queensland, and oats in New Zealand. In Tasmania only 28·6 per cent. of the cultivated area is under wheat, which, however, is still the principal crop of the colony :—

Crop.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	New Zealand.	Australasia.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Wheat	58·4	68·6	12·5	81·3	45·4	28·6	15·6	56·6
Maize	8·8	0·3	26·2	....	0·1	0·1	1·0	3·4
Barley	0·3	2·5	1·8	0·7	2·1	3·4	2·8	1·6
Oats.....	1·2	8·6	0·2	0·9	2·1	20·0	23·0	7·4
Potatoes	1·4	1·8	2·5	0·4	1·5	12·0	2·1	1·7
Hay	22·7	14·3	14·0	13·9	42·3	18·8	14·0	15·0
Vines	0·4	0·9	0·5	0·9	1·7	....	....	0·6
Sugar-cane	0·9	....	26·3	....	....	....	....	1·3
Other crops	5·9	3·0	16·0	1·9	4·8	17·1	41·5	12·4
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

The position in which each of the principal agricultural products stood in relation to the total area under crop in Australasia, at various periods since the year 1861, may be ascertained from the following table. The figures should, however, be taken in conjunction with those giving the actual areas cultivated, for a decline in the proportion of land under any particular crop does not necessarily mean a falling-off in the area devoted to that product; on the contrary, in few instances has there been any actual retrogression. It is satisfactory to observe that there is a greater proportionate increase in the cultivation of the more valuable crops, and that, despite checks from causes due to unfavourable seasons, the area devoted to vines, sugar-cane, and "other crops" formed 14·3 per cent. of the whole in 1899, as compared with 8·6 per cent. in 1861 :—

Product.	1861.	1871.	1881.	1891.	1899.
	per cent.	per cent.	per cent.	per cent.	per cent.
Wheat	53·6	51·4	60·7	55·0	56·6
Oats	10·6	13·5	7·9	8·4	7·4
Maize	4·6	5·3	3·0	4·3	3·4
Barley	2·2	2·3	1·9	1·4	1·6
Potatoes	4·2	3·0	1·8	2·0	1·7
Hay	16·2	11·9	15·1	16·0	15·0
Vines.....	0·5	0·7	0·3	0·7	0·6
Sugar-cane	.....	0·5	0·7	1·1	1·3
Other crops	8·1	11·4	8·6	11·1	12·4
Total.....	100·0	100·0	100·0	100·0	100·0

WHEAT.

Only three of the seven colonies—Victoria, South Australia, and New Zealand—produce sufficient wheat for their own requirements; although during the last two years Tasmania has had a surplus, and in 1898 New South Wales produced enough for home consumption. But after the deficiencies of the rest of Australasia are supplied by the three above-named colonies, there is in most seasons a large balance for export, which finds a ready market in Great Britain, where Australian wheat is well and favourably known. For the season 1899–1900, although

a larger area was sown than at any previous period, protracted drought, coupled with unseasonable rainfall, had the effect of greatly curtailing the production. Taking Australasia as a whole, there was a net export of breadstuffs, during 1899, equivalent to 14,557,709 bushels of grain, valued at £1,843,300.

The subjoined table shows the progress of wheat-growing during the period of the last thirty-nine years:—

State.	1861.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales	123,468	154,030	221,888	356,666	1,426,166
Victoria	196,922	334,609	926,729	1,332,683	2,165,693
Queensland	392	3,024	10,958	19,306	52,527
South Australia	310,636	692,508	1,768,781	1,552,423	1,821,137
Western Australia	13,584	25,697	21,951	26,866	84,516
Tasmania	58,823	63,332	51,757	47,584	64,328
Commonwealth.....	703,825	1,273,200	3,002,064	3,335,528	5,614,367
New Zealand	29,531	108,720	365,715	402,273	269,749
Australasia	733,356	1,381,920	3,367,779	3,737,801	5,884,116

It will be seen that, during the twenty years extending from 1861 to 1881, all the colonies, with the exception of Tasmania, made considerable additions to the area under wheat, the increase for the whole of Australasia being 2,634,423 acres, or an advance of 359 per cent. From 1881 to 1899 the extension of this form of cultivation has not been so general, most of the increase in area having taken place during the last few seasons, in consequence of the rise in the prices of wheat which was taken advantage of by the agriculturists of all the colonies. New Zealand is the only province which shows a decrease. In Australasia, as a whole, the increase in area since 1881 amounts to 2,516,337 acres—and of this total 2,443,242 acres have been added in New South Wales and Victoria. In New South Wales, especially, rapid advance has been made, while in South Australia and New Zealand part of the areas which were abandoned as wheat lands has again been placed under this cereal. At present more than one-half of the land in cultivation is devoted to wheat-growing, and in an ordinary season the produce of 750,000 acres is available for export to Europe.

The production of wheat during the period covered by the preceding table was as follows :—

State.	1861.	1871.	1881.	1891.	1899.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	1,606,034	2,229,642	3,405,966	3,963,668	13,604,166
Victoria	3,607,727	4,500,795	8,714,377	13,629,370	15,237,948
Queensland	5,880	36,288	39,612	392,309	614,414
South Australia	3,410,756	3,967,079	8,087,032	6,436,488	8,453,135
Western Australia	160,155	345,368	153,657	288,810	987,329
Tasmania	1,380,913	847,962	977,365	930,841	1,101,303
Commonwealth.....	10,171,465	11,927,134	21,378,009	25,641,486	39,998,295
New Zealand.....	772,531	2,448,203	8,297,890	10,257,738	8,581,898
Australasia	10,943,996	14,375,337	29,675,899	35,899,224	48,580,193

The greatest increase in production is shown by New South Wales, which in 1899 produced nearly ten million bushels more than in 1891, and from the following statement which gives the proportion of the total crop produced by each colony in 1881, 1891, and 1899, the progress made by New South Wales will be evident, for whereas in 1881 and 1891 it only produced 11 per cent. of the total crop, in 1899 it produced 28 per cent. Victoria and New Zealand show the largest declines, the proportions falling from 38 per cent. and 28·6 per cent. in 1891 to 31·4 per cent. and 17·7 per cent. respectively in 1899 :—

State.	1881.	1891.	1899.
	per cent.	per cent.	per cent.
New South Wales	11·5	11·0	28·0
Victoria	29·4	38·0	31·4
Queensland	0·1	1·1	1·2
South Australia	27·2	17·9	17·4
Western Australia	0·5	0·8	2·0
Tasmania.....	3·3	2·6	2·3
New Zealand	28·0	28·6	17·7
Australasia.....	100·0	100·0	100·0

As a producer of wheat, Australasia is of little account when viewed in comparison with the great wheat-producing countries of the world. According to the estimate published by the United States Department of Agriculture, the production of wheat in Europe, America, Asia, and Africa in 1899 was 2,586,884,000 bushels, which, with the 48,580,000 bushels yielded by Australasia, gives the world's production as 2,635,564,000 bushels; and the seven colonies, therefore, only produced 1·8 per cent. of the total crop. The figures for each country are appended, the production being represented in Imperial bushels:—

Country.	Bushels.	Country.	Bushels.
Europe—		Africa—	
Russia	381,693,000	Algeria	14,538,000
France	354,804,000	Egypt	13,569,000
Hungary	144,954,000	Tunis	4,652,000
Germany	137,015,000	Cape Colony	1,938,000
Italy	133,664,000		
Spain	85,290,000	Total	34,697,000
United Kingdom	67,190,000		
Austria	40,980,000		
Roumania	25,261,000	America—	
Bulgaria	23,261,000	United States	530,447,000
Turkey	14,538,000	Argentine Republic	89,328,000
Belgium	12,018,000	Canada	58,113,000
Servia	8,432,000	Mexico	14,538,000
Portugal	6,203,000	Chili	12,600,000
Sweden and Norway	4,545,000	Uruguay	6,944,000
Holland	4,168,000		
Switzerland	4,070,000	Total	711,970,600
Denmark	3,392,000		
Greece	1,938,000		
		Australasia—	
Total	1,453,416,000	Victoria	15,238,000
		New South Wales	13,604,000
Asia—		New Zealand	8,582,000
India	225,422,000	South Australia	8,453,000
Russia in Asia	90,534,000	Tasmania	1,101,000
Turkey	34,116,000	Western Australia	987,000
Japan	19,384,000	Queensland	615,000
Persia	15,507,000		
Cyprus	1,938,000	Total	48,580,000
Total	386,901,000	Grand Total	2,635,564,000

The yield of wheat per acre during the season 1899–1900 ranged from 4·64 bushels in South Australia to 31·81 bushels in New Zealand, but taken on the whole was not very satisfactory, on account of the drought which generally prevailed throughout the continent. With the exception of Western Australia and New Zealand, the yield was below the average for the last ten years. The yields in New Zealand during the last two seasons were much higher than in any of the

preceding eight years. On the other hand, the decennial averages for most of the other colonies have been reduced through the drought which has continued for the last five years. The average yield per acre for each colony for 1899 and during the ten years 1890–99 are shown below :—

State.	Average Yield per acre.	
	1899.	1890–99.
	bushels.	bushels.
New South Wales	9·54	9·95
Victoria	7·04	8·07
Queensland	11·70	15·53
South Australia	4·64	4·69
Western Australia	11·68	10·95
Tasmania	17·12	19·05
Commonwealth	7·12	7·33
New Zealand	31·81	24·61
Australasia	8·26	8·49

A yield of 8·5 bushels per acre is a very small one when compared with the following results obtained in some of the principal wheat-growing countries of the world. The averages shown are mostly based on the yields during the five years 1894–98 :—

Country.	Average Yield per acre.	Country.	Average Yield per acre.
	bushels.		bushels.
United Kingdom	30·9	United States	13·2
Germany	25·7	India	12·1
France	18·6	Russia	9·3
Hungary	16·8	Argentine Republic	9·3

A bare statement of averages, however, is somewhat misleading. In South Australia, for example, it is found that owing to favourable conditions of culture a yield of 7 bushels is financially as satisfactory a crop as one of 15 bushels in New South Wales or of 20 bushels in New Zealand. In the Australasian colonies the yield could be greatly increased if cultivation of a more scientific character were adopted. As a rule, the seed is simply put into the ground, and little is done to assist the natural growth of the crops.

The total value of the wheat crop for 1899–1900 and the value of the return per acre in each colony are shown below :—

State.	Value of Production.	Value per Acre.
	£	£
New South Wales	1,784,400	1 5 0
Victoria	2,031,800	0 18 9
Queensland	87,300	1 13 3
South Australia	1,124,300	0 12 4
Western Australia	148,100	1 15 1
Tasmania	133,300	2 1 5
Commonwealth	5,309,200	0 18 11
New Zealand	1,072,800	3 19 6
Australasia	6,382,000	1 1 8

The very high value returned in New Zealand is due to the rather small area under cultivation, and to the phenomenal yield of grain ; the values in Tasmania, Western Australia, and Queensland also appear high for similar reasons.

A detailed table of the value of the yield per acre during each of the last ten years is shown below for the three principal wheat-growing colonies—New South Wales, Victoria, and South Australia. The values are estimated on the basis of the market rates ruling in February and March of each year. It will be seen that a considerable decline took place between 1891 and 1895, due for the most part to the fall in prices rather than to any decrease of production. The effect of the rise in prices is seen in the more satisfactory results in New South Wales during the seasons ending March, 1896, 1897, and 1898 ; for Victoria and South Australia the drought is largely responsible for the low values in those years :—

Year ending March.	Average Yield per acre.			Value of Average Yield per acre.		
	New South Wales.	Victoria.	South Australia.	New South Wales.	Victoria.	South Australia.
	bushels.	bushels.	bushels.	£ s. d.	£ s. d.	£ s. d.
1891	10·9	11·1	5·6	2 0 10	1 19 9	0 19 7
1892	11·1	10·3	4·3	2 2 6	2 2 3	0 17 11
1893	15·1	11·0	6·1	2 5 2	1 14 0	0 19 3
1894	11·0	10·4	7·9	1 10 1	1 0 1	0 18 4
1895	10·9	8·3	4·9	1 4 6	0 13 6	0 8 0
1896	8·7	4·0	4·2	1 17 0	0 17 9	0 19 10
1897	10·2	4·5	1·7	2 3 5	1 3 8	0 8 7
1898	10·6	6·4	2·6	2 4 2	1 6 2	0 11 3
1899	7·0	9·1	4·9	0 19 0	0 19 9	0 13 7
1900	9·5	7·0	4·6	1 5 0	0 18 9	0 12 4

The rates just given, as well as elsewhere in this chapter, represent farm prices, and not values at the place of consumption.

The average consumption of wheat per head of population in each of the seven colonies for the last decade was as stated below. The large proportion of adult male population in Western Australia accounts for the high figures for that province :—

	Bushels.
New South Wales	5·9
Victoria	5·7
Queensland	5·6
South Australia	6·3
Western Australia	9·3
Tasmania	7·5
New Zealand	7·5

For the whole of Australasia, the average consumption was 6·3 bushels per head, which is larger than the quantity consumed in any other part of the world for which records are available, with the exception of France and Canada.

The following table shows the net imports or exports of wheat and flour of each of the colonies during the year 1899, 1 ton of flour being taken as equal to 50 bushels of grain. The exporting colonies are Victoria, South Australia, New Zealand, and Tasmania. Since 1896, New South Wales has almost been able to supply the wheat required for the food of its inhabitants, and in 1898 was actually independent of outside supplies, but in 1899 a small import was again necessary. During the last two years Tasmania has not only produced enough wheat for home consumption, but has had a small surplus, available for export :—

State.	Net Imports.	Net Exports.
	bushels.	bushels.
New South Wales	2,126,453	.....
Victoria	.....	10,635,840
Queensland	2,326,584	.....
South Australia	.....	5,609,041
Western Australia	623,688	.....
Tasmania	.....	413,042
Commonwealth	.....	11,581,198
New Zealand	.....	2,976,511
Australasia	.....	14,557,709

The records for the six states which form the Commonwealth show that since 1879 there were only four years during which they were forced to import wheat from places outside their boundaries. These years were 1886, 1889, 1896, and 1897. In the first-named year the wheat crop was a partial failure in Victoria and South Australia, and almost a complete failure in New South Wales and Queensland. In 1889 there was a general failure in New South Wales and Victoria. In 1896 the crop failed in Victoria, and in the following year, that Colony for the first time in twenty-two years was compelled to import wheat, the net import, however, being only 61,160 bushels. The following statement gives the figures for the Commonwealth for the twenty years since 1880 :- -

Year.	Wheat Crop.	Net Export of Breadstuffs.	Year.	Wheat Crop.	Net Export of Breadstuffs.
	bushels.	bushels.		bushels.	bushels.
1880	28,730,159	11,594,381	1890	34,039,289	8,836,170
1881	23,438,161	7,988,161	1891	27,118,259	10,646,298
1882	21,378,009	5,751,130	1892	25,675,265	4,126,538
1883	21,492,565	4,742,290	1893	32,759,693	8,829,941
1884	35,714,456	17,130,843	1894	36,929,947	11,916,782
1885	30,559,060	11,583,644	1895	30,855,812	6,774,377
1886	20,165,988	(—) 603,532	1896	19,557,726	(—) 4,347,168
1887	28,899,220	4,265,924	1897	20,880,479	(—) 3,641,306
1888	35,930,697	10,643,673	1898	28,241,409	1,341,596
1889	19,757,509	(—) 2,107,136	1899	41,417,853	11,581,198

(—) denotes excess of imports.

In ordinary seasons Australasia ranks about sixth amongst the exporting countries; still, its contribution to the world's markets does not form more than one-thirtieth of the demand, and it cannot, therefore, be said to form a factor of any consequence in the trade.

The United Kingdom is the largest importer of wheat, and the British demand largely influences the price throughout the world. The average London prices per quarter of 8 bushels during the last decennial period were as follow :—

Year.	Price per quarter.	Year.	Price per quarter
	s. d.		s. d.
1890	31 11	1895	23 1
1891	37 0	1896	26 2
1892	30 3	1897	30 2
1893	26 4	1898	34 0
1894	22 10	1899	25 8

Oats.

The cultivation of oats, which come next to wheat in importance as a grain crop, is increasing in Australasia, as the following figures show:—

State.	1861.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales	7,224	13,795	16,348	12,958	29,125
Victoria	91,061	175,944	146,995	190,157	271,280
Queensland	69	131	88	715	714
South Australia	1,638	3,586	3,023	12,637	20,229
Western Australia	507	1,474	827	1,301	3,940
Tasmania	29,022	29,631	27,535	28,360	45,110
Commonwealth	129,521	224,561	194,816	246,128	370,398
New Zealand	15,872	139,185	243,387	323,508	398,243
Australasia	145,393	363,746	438,203	569,636	768,641

The colony of New Zealand furnishes considerably more than one-half of the production of oats. In New South Wales the cultivation of the cereal has been comparatively neglected; in Victoria and Tasmania however, it is next to wheat in importance; whilst in Queensland, South Australia, and Western Australia the climate is ill-adapted to the cultivation of oats, and the yield is small and counts for very little in the total production of the grain. The total yield in each colony for the period covered by the preceding table was as follows:—

State.	1861.	1871.	1881.	1891.	1899.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	152,426	280,887	356,566	276,259	627,904
Victoria	2,136,430	3,299,889	3,612,111	4,412,730	6,116,046
Queensland	.....	.....	1,121	16,669	10,712
South Australia	33,160	38,894	32,219	80,876	218,331
Western Australia	8,162	28,330	8,270	18,539	73,556
Tasmania	751,475	593,477	783,129	873,173	1,148,160
Commonwealth	3,081,653	4,241,477	4,793,416	5,678,246	8,194,709
New Zealand	512,665	3,726,810	6,924,848	11,009,020	16,325,832
Australasia	3,594,318	7,968,287	11,718,264	16,687,266	24,520,541

The average yield per acre in each colony in 1899, and during the ten years 1890–99 are shown below :—

State.	Average yield per acre.	
	1899.	1890-99.
	bushels.	bushels.
New South Wales	21·6	19·4
Victoria	22·5	9·6
Queensland	15·0	18·1
South Australia	10·8	8·1
Western Australia	18·7	16·6
Tasmania	25·5	28·3
Commonwealth	22·1	20·0
New Zealand	41·0	32·8
Australasia	31·9	26·6

Of the colonies which grow oats to any extent Tasmania was the only one whose yield last year was below the decennial average. New Zealand had the very high average of 41 bushels per acre, which compares more than favourably with the averages which prevailed during 1894–98 in the following principal oat-growing countries of the world :—

Country.	Average yield per acre.	Country.	Average yield per acre.
	bushels.		bushels.
United Kingdom	40·0	United States	26·3
Germany	35·0	France	26·0
Canada	31·1	Austria	19·8
Hungary	27·0	Russia, in Europe.	14·9

The total value of the oats crop and the return per acre, in each of the Australasian colonies, for the season 1899–1900, will be found below :—

State.	Value.	Value per acre.
	£	£ s. d.
New South Wales	75,800	2 12 1
Victoria	526,000	1 18 9
Queensland	1,300	1 16 5
South Australia	22,700	1 2 5
Western Australia	7,300	1 17 1
Tasmania	95,300	2 2 3
Commonwealth	728,400	1 19 4
New Zealand	1,436,600	3 12 2
Australasia	2,165,000	2 16 4

The net import or export of oats by each of the colonies is given in the following table. New Zealand was the only province which exported this cereal to any considerable extent in 1899, although Tasmania and Victoria also exported fairly large quantities. Owing to the war in South Africa, a large demand for oats as horse-feed was created in that country, and altogether 753,470 bushels, valued at £66,000, were exported from New Zealand, Tasmania, and Victoria. New Zealand also exported 693,281 bushels to the United Kingdom :—

State.	Net Imports.	Net Exports.
	bushels.	bushels.
New South Wales	1,690,912	.....
Victoria	.....	377,925
Queensland	186,333	.....
South Australia	306,200	.....
Western Australia	755,499	.....
Tasmania	.....	910,106
Commonwealth	1,650,913	.....
New Zealand	.....	3,515,909
Australasia	.....	1,864,996

According to a carefully-compiled estimate of the average production of oats throughout the world, issued by the Agricultural Department of the United States, the commercial supply of this grain in 1899 is represented by the following condensed results :—

	Bushels.
Europe	2,102,942,000
North America	897,412,000
Asia	83,988,000
Africa	4,453,000
Australasia	24,521,000
Total	3,113,316,000

Maize.

Maize is, next to sugar-cane, the principal crop grown in Queensland, and is one of the most important products of New South Wales. In the other colonies the climate is not suited to its growth, and the cultivation of the cereal extends to not quite 29,000 acres. The following

figures show that fair progress has been made since 1861 in the area devoted to this crop :—

State.	1861.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales	57,959	119,956	117,478	174,577	214,697
Victoria	1,714	1,709	1,783	8,230	11,037
Queensland	1,914	20,329	46,480	101,598	110,489
Other colonies.....	91	113	36	23	266
Commonwealth	61,678	142,107	165,777	284,428	336,489
New Zealand	770	.....	3,177	5,447	17,429
Australasia ...	62,448	142,107	168,954	289,875	353,918

The production in the same years was as follows :—

State.	1861.	1871.	1881.	1891.	1899.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	1,727,434	4,015,973	4,330,956	5,721,706	5,976,022
Victoria	20,788	30,833	81,007	461,447	624,844
Queensland	42,100	508,000	1,313,655	3,077,915	1,965,598
Other colonies ...	367	2,000	648	483	2,263
Commonwealth	1,790,689	4,556,806	5,726,266	9,261,551	8,568,727
New Zealand	31,570	.....	127,257	238,746	669,896
Australasia ...	1,822,259	4,556,806	5,853,523	9,500,297	9,238,623

The following table shows the average yield of each colony and of Australasia for 1899, and for the ten years ended 1899 :—

State.	Average yield per acre.	
	1899.	1890-99.
	bushels.	bushels.
New South Wales	27·8	29·9
Victoria	56·6	52·1
Queensland	17·8	24·1
Western Australia	17·0	18·2
Commonwealth	25·5	28·6
New Zealand	38·4	42·0
Australasia	26·1	28·9

The averages for Victoria and New Zealand are of little value, as the area under maize in those colonies is small and very favourably situated; while Western Australia, during the whole ten years, had but 741 acres under cultivation, producing 13,476 bushels.

The total value of the crop for the season 1899–1900, and the average return per acre, will be found below :—

State.	Total value of crop.	Average value per acre.
	£	£ s. d.
New South Wales	784,500	3 13 1
Victoria	87,200	7 18 0
Queensland	318,400	2 17 6
Other colonies	400	1 10 1
Commonwealth	1,190,500	3 10 9
New Zealand	92,500	5 6 2
Australasia	1,283,000	3 12 6

The high average value per acre of maize produced in Victoria and New Zealand is due to the fact that the area under this crop is small, and the local average prices are relatively higher than in New South Wales and Queensland, where large areas are devoted to the cultivation of this cereal.

The net import or export of maize by each colony during 1899 was as follows :—

State.	Net Imports.	Net Exports.
	bushels.	bushels.
New South Wales	357,401	.....
Victoria	.....	124,166
Queensland	501,095	.....
South Australia	4,706	.....
Western Australia	10,722	.....
Tasmania	194	.....
Commonwealth	749,952	.....
New Zealand	.....	187,932
Australasia	562,020	.....

It is rather curious that the principal maize-growing colonies, New South Wales and Queensland, were the only ones to import maize to any extent. In this part of the world corn does not enter into consumption as an article of food, as it does in other countries, and particularly in America, which produces and consumes more than 80 per cent. of the whole maize crop of the world, as the following figures for 1899—compiled on the authority of the Department of Agriculture in the United States—will show :—

	bushels.
North America	1,985,276,000
South America	67,778,000
Europe	457,111,000
Africa	33,335,000
Australasia	9,239,000
Total	2,552,739,000

Barley.

Of the cereal productions of Australasia, barley is grown on the smallest acreage. The area under this crop at different periods was as follows :—

State.	1861.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales	2,924	3,461	6,427	4,459	7,154
Victoria	3,419	16,772	48,652	45,021	79,573
Queensland	13	971	256	739	7,474
South Australia	10,637	17,225	11,953	11,461	15,767
Western Australia	2,412	5,083	3,679	3,738	3,885
Tasmania	7,279	4,275	4,597	2,650	7,606
Commonwealth	26,684	47,787	75,564	68,068	121,459
New Zealand	3,457	13,305	29,808	24,268	48,003
Australasia	30,141	61,092	105,372	92,336	169,462

For the same years the production was as stated below :—

State.	1861.	1871.	1881.	1891.	1899.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	41,054	55,284	135,218	93,446	132,476
Victoria	68,118	335,506	927,566	830,741	1,466,088
Queensland	158	11,836	3,207	21,302	118,443
South Australia	168,137	164,161	137,165	107,183	188,917
Western Australia	2,412	5,083	36,790	48,594	56,587
Tasmania	169,381	76,812	102,475	71,686	142,721
Commonwealth	449,260	648,682	1,342,421	1,172,952	2,105,232
New Zealand	96,658	287,646	664,093	688,683	1,585,145
Australasia	545,918	936,328	2,006,514	1,861,635	3,690,377

The average yield of barley per acre in each colony for 1899, and for the ten years ended 1899, is given in the following table :—

State.	Average Yield per Acre.	
	1899.	1890-99.
	bushels.	bushels.
New South Wales	18·5	17·3
Victoria	18·4	17·2
Queensland	15·8	17·7
South Australia	12·0	11·6
Western Australia	14·6	12·8
Tasmania	18·8	22·8
Commonwealth	17·3	16·7
New Zealand	33·0	28·7
Australasia	21·8	20·0

As in the case of the other three cereals which have just been dealt with, New Zealand had a far larger yield of barley per acre than any other colony, and compares favourably with the following countries, which averaged during 1894–98—United Kingdom, 34·0 bushels per acre ; Germany, 30·0 ; United States, 22·5 ; and France, 21·0 bushels per acre. Barley is not cultivated in these colonies to the extent it deserves, and to the

total production of 816,391,000 bushels by the world in 1899 Australasia contributed only 3,690,000 bushels. In fruitful seasons Australasia produces sufficient barley, exclusive of that required for malt, for home requirements, and a small surplus for export; but if the combined trade in barley and malt be considered, all the colonies, with the exception of Victoria, Tasmania, and New Zealand, are dependent upon external sources. The high import duties in Victoria on both these articles practically prohibit importations. The trade in barley and malt of each colony in 1899 was as follows:—

State.	Barley.		Malt.	
	Net Imports.	Net Exports.	Net Imports.	Net Exports.
	bushels.	bushels.	bushels.	bushels.
New South Wales	115,966	.....	422,272	.....
Victoria	.....	5,480	.....	16,070
Queensland	57,933	.....	127,411	.....
South Australia	.....	3,700	18,424	.....
Western Australia	20,587	.....	140,989	.....
Tasmania	.....	1,864	500	.....
Commonwealth	183,442	.....	693,526	.....
New Zealand	.....	125,437	.....	172,511
Australasia	58,005	.....	521,015	.....

The total value of the barley crop and the average return of this cereal per acre during the season 1899–1900 will be found below:—

State.	Total value of barley crop.	Average value per acre.
	£	£ s. d.
New South Wales	16,000	2 4 9
Victoria	276,000	3 9 4
Queensland	20,300	2 14 4
South Australia	33,000	2 1 10
Western Australia	9,900	2 11 0
Tasmania	25,000	3 5 9
Commonwealth	380,200	3 2 7
New Zealand	237,800	4 19 1
Australasia	618,000	3 12 11

Potatoes.

The cultivation of the potato is not confined to any particular colony. Victoria and New South Wales have the largest areas under this crop, but both are exceeded by New Zealand in production. The following table shows the acreage under potatoes in each colony:—

State.	1861.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales	10,040	14,770	15,943	22,560	34,968
Victoria	27,174	39,064	39,129	57,334	55,469
Queensland	512	3,121	5,086	9,173	10,766
South Australia	2,612	3,156	6,136	6,892	8,406
Western Australia	277	494	278	532	2,837
Tasmania	9,349	8,154	9,670	16,393	26,951
Commonwealth...	49,964	68,759	76,242	112,884	139,397
New Zealand.....	7,292	11,933	22,540	27,266	36,984
Australasia	57,256	80,692	98,782	140,150	176,381

The production for the same periods was as follows:—

State.	1861.	1871.	1881.	1891.	1899.
	tons.	tons.	tons.	tons.	tons.
New South Wales	30,942	44,758	44,323	62,283	81,337
Victoria	59,364	125,841	134,290	109,786	173,381
Queensland	1,080	6,585	11,984	25,018	22,675
South Australia	7,726	10,989	18,154	27,824	19,716
Western Australia	817	1,457	556	1,596	8,372
Tasmania	47,428	22,608	33,565	63,100	101,670
Commonwealth...	147,357	212,238	242,872	289,607	407,151
New Zealand.....	37,554	42,130	121,890	162,046	222,124
Australasia	184,911	254,368	364,762	451,653	629,275

The average production of potatoes per acre is next given, for 1899, and for the ten years ended 1899. New Zealand, it will be seen, shows a considerably larger return than any of the other provinces :—

State.	Average Yield per Acre.	
	1899.	1890-99.
	tons.	tons.
New South Wales	2·3	2·6
Victoria	3·1	3·3
Queensland	2·1	3·0
South Australia	2·3	2·8
Western Australia	3·0	3·3
Tasmania	3·8	3·7
Commonwealth	2·9	3·1
New Zealand	6·0	5·9
Australasia	3·6	3·7

Only three of the colonies are in a position to export potatoes in any quantity—Tasmania, Victoria, and New Zealand. The surplus in Victoria, though at one time considerable, has now very much decreased. The following were the imports or exports of potatoes by each colony in 1899 :—

State.	Net Imports.	Net Exports.
	tons.	tons.
New South Wales	58,384	.....
Victoria	.....	10,962
Queensland	15,054	.....
South Australia	2,665	.....
Western Australia	8,886	.....
Tasmania	.....	45,628
Commonwealth	28,399	.....
New Zealand	.....	25,393
Australasia	3,006	.....

The total value of the potato crop and the average return per acre for 1899–1900 will be found below :—

State.	Value of crop.	Average value per acre.
	£	£ s. d.
New South Wales	193,200	5 10 6
Victoria	379,400	6 16 10
Queensland	56,800	5 5 6
South Australia	43,500	5 3 6
Western Australia	25,100	8 16 11
Tasmania	213,500	7 18 5
Commonwealth	911,500	6 10 9
New Zealand	466,500	12 12 3
Australasia	1,378,000	7 16 3

Hay.

Considerable quantities of wheat, oats, barley, and lucerne are grown for the purpose of being converted into hay, but the area cut varies, of course, according to the season. The area cut for hay has largely increased since 1881, as will be seen from the table appended :—

State.	1861.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales	45,175	51,805	146,610	163,863	554,048
Victoria	74,681	103,206	212,150	369,498	450,189
Queensland	280	3,828	16,926	30,655	58,939
South Australia	62,874	97,812	333,467	304,171	311,440
Western Australia	6,676	*14,342	24,445	28,534	78,880
Tasmania	31,803	31,578	34,790	45,445	42,492
Commonwealth	221,489	302,571	768,388	942,166	1,495,988
New Zealand	†27,160	30,717	68,423	46,652	243,344
Australasia	248,649	333,288	836,811	988,818	1,739,332

* In 1869. † In 1867.

In New Zealand, for all the years except the last, the areas shown only include the extent of sown grasses cut for hay. In 1899 this area was 68,234 acres. It is not possible to quote for the earlier years the area under wheat, oats, &c., cut for this purpose. Similarly, the production shown below for those years only includes the quantity of grass cut :—

State.	1861.	1871.	1881.	1891.	1899.
	tons.	tons.	tons.	tons.	tons.
New South Wales	57,363	77,460	198,532	209,417	546,850
Victoria	92,497	144,637	238,793	505,246	596,193
Queensland	459	6,278	19,640	58,842	103,409
South Australia	78,886	98,266	240,827	193,317	229,800
Western Australia	6,609	14,288	24,445	28,534	70,078
Tasmania	59,851	30,891	44,957	66,996	51,123
Commonwealth	295,665	371,820	767,194	1,062,352	1,597,453
New Zealand	36,666	35,674	89,081	67,361	450,800
Australasia	332,331	407,494	856,275	1,129,713	2,048,253

The average yield of hay per acre will be found in the next table, the periods covered being the year 1899 and the ten years which closed with 1899. The production of hay in New Zealand is not known accurately, but has been estimated at 1·9 tons per acre :—

State.	Average yield per acre.	
	1899.	1890–99.
	tons.	tons.
New South Wales	1·0	1·0
Victoria	1·3	1·2
Queensland	1·8	1·9
South Australia	0·7	0·7
Western Australia	0·9	0·9
Tasmania	1·2	1·3
Commonwealth	1·1	1·1
New Zealand	1·9	1·9
Australasia	1·2	1·2

The greater portion of the hay is produced from wheat, although in New South Wales, Victoria, Queensland, and New Zealand there are large areas under oaten and lucerne hay, which are in great demand and readily sell at remunerative prices; in fact, so profitable is the return from oaten hay, that in New South Wales and Queensland the cultivation of oats for threshing is practically neglected for the sake of hay. For the most part, hay is grown in each province in quantities sufficient for its own requirements, New South Wales, Queensland, and Western Australia ordinarily being the only colonies which import to any extent.

The net import or export of hay and chaff by each colony during the year 1899 was as follows:—

State.	Net Imports.	Net Exports.
	tons.	tons.
New South Wales	131,609	.....
Victoria	.....	105,177
Queensland	12,317	.....
South Australia	.....	10,631
Western Australia	871	.....
Tasmania	.....	11,206
Commonwealth	17,783	.....
New Zealand	.....	571
Australasia	17,212	.....

The value of the return from hay in 1899–1900 was only second to that from wheat; the value in each colony and the return per acre will be found below:—

State.	Total Value of Hay Crop.	Average Value per Acre.
	£	£ s. d.
New South Wales	1,757,400	3 3 5
Victoria	1,959,000	4 7 0
Queensland	326,500	5 10 10
South Australia	551,500	1 15 5
Western Australia	210,200	2 13 4
Tasmania	148,400	3 9 10
Commonwealth	4,953,000	3 6 3
New Zealand	1,057,000	4 6 11
Australasia	6,010,000	3 9 1

Green Forage and Sown Grasses.

The cultivation of maize, sorghum, barley, oats, and other cereals for the purpose of green food, and the laying-down of lands under lucerne and grass, engage attention in the districts where dairy-farming is carried on. The agricultural returns of some of the colonies do not admit of a distribution being made between these forms of cultivation prior to 1887. The following table shows the area under such green food in 1887, 1891, and 1899, and it will be seen that there have been large developments in most of the colonies, especially in New South Wales.

The return from the cultivation of green forage in all the colonies during the season 1899-1900 is estimated at £518,000, or nearly £3 an acre.

State.	Green Food.			Sown Grasses.		
	1887.	1891.	1899.	1887.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.	acres.
New South Wales..	20,403	32,138	75,518	192,678	333,238	378,852
Victoria...	6,036	9,202	18,574	154,612	174,982	154,232
Queensland	9,582	10,727	35,514	13,619	20,921	19,228
South Australia ...	10,079	6,416	12,460	23,217	17,519	21,593
Western Australia	... ..	238	1,000	.....	.....	2,590
Tasmania	1,246	1,101	3,091	184,653	208,596	290,618
Commonwealth	47,346	59,822	146,157	568,779	755,256	867,113
New Zealand	98,029	118,484	26,645	5,869,247	7,357,229	10,853,302
Australasia ...	145,375	178,306	172,802	6,438,026	8,112,485	11,720,415

Apparently there has been a decrease since 1891 in the acreage under green food in New Zealand, but it is believed that the greater portion of the area shown in the two earlier years was really sown for hay. In Victoria, Queensland, Tasmania, and New Zealand various areas of sown grasses are cut for seed, chiefly rye grass and cocksfoot, the total quantity of grass seed produced in 1899 being 13,391 tons, valued at £335,000. The production in Victoria was 250 tons; in Queensland, 3 tons; in Tasmania, 240 tons; and in New Zealand, 12,898 tons. The acreage on which this grass seed was produced is included in the total given above for sown grasses, and amounted to 2,283 acres in Victoria, 24 acres in Queensland, 1,841 acres in Tasmania, and 94,261 acres in New Zealand.

The Vine.

The history of the vine in Australia dates from the year 1828, when cuttings from the celebrated vineyards of France, Spain, and the Rhine Valley were planted in the Hunter River District of New South Wales, forming the nursery for the principal vineyards of that colony. Years afterwards the vine was planted in the Murray River District and other parts of New South Wales, and was afterwards introduced into Victoria and South Australia, and is now cultivated in all the provinces of the Australian continent. In South Australia a large number of Germans are employed in the industry of wine-making.

The climate and soil of Australia are peculiarly adapted to the successful cultivation of the vine, and with an increasing local demand, and the opening up of a market in England, where Australian wines have obtained due appreciation, the future expansion of wine-growing appears fairly assured. The depreciation which some of the foreign wines have suffered, both in quantity and quality, owing to the devastation of the vineyards by phylloxera, is an additional reason why the vine-growers of this continent should look forward to largely-increased operations for their industry.

The progress of vine cultivation since the year 1861 is illustrated by the table subjoined. The areas given include the vines producing table-fruit, as well as those cultivated for wine-making, also the young vines not yet in bearing :—

State.	1861.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales	1,130	4,152	4,027	8,281	8,278
Victoria	1,464	5,523	4,923	24,483	27,550
Queensland	40	568	1,212	1,988	2,003
South Australia.....	3,918	5,455	4,202	12,314	19,438
Western Australia	457	692	527	1,004	3,251
Australia	7,009	16,390	14,891	48,070	60,520

At present the area devoted to vines is much larger in Victoria and South Australia than in the other colonies. Of recent years great attention has been paid to the industry in Victoria, and that province in a favourable season produces half the wine made in Australia. Vine-growing has never been carried on to any extent in Tasmania or New Zealand, although there are numerous places in the latter colony suited for growing vines for the manufacture of both wine and raisins. The area under vines in New Zealand in 1899 was returned at 445 acres.

The following tables show the progress made in wine-growing during the last thirty-nine years :—

State.	1861.	1871.	1881.	1891.	1899.
	gallons.	gallons.	gallons.	gallons.	gallons.
New South Wales.....	85,328	413,321	513,688	913,107	739,668
Victoria	47,568	713,589	539,191	1,554,130	933,282
Queensland.....	.....	.....	72,121	168,526	131,045
South Australia.....	312,021	852,315	313,060	861,835	954,367
Western Australia	.....	.....	99,600	166,664	100,000
Australia	444,917	1,979,225	1,537,660	3,604,262	2,858,362

The production of table-grapes during the same period is shown below :—

State.	1861.	1871.	1881.	1891.	1899.
	tons.	tons.	tons.	tons.	tons.
New South Wales.....	224	508	1,103	3,694	3,652
Victoria	849	1,545	740	2,791	4,592
Queensland.....	.....	.....	255	1,169	500
South Australia.....	1,161	1,692	1,498	4,590	5,402
Western Australia	.....	.....	.....	.....	400
Australia...	2,234	3,745	3,596	12,244	14,546

Among other produce of the vineyards may be mentioned 9,624 gallons of brandy in New South Wales, and 615 gallons in Queensland; while Victoria and South Australia produced respectively 21,162 cwt. and 8,445 cwt. of raisins and currants.

It is impossible to tabulate the average wine-yield of all the colonies, as in many instances the acreage under cultivation for wine-making purposes cannot be separated from young unproductive vineyards or areas cultivated for table varieties of the grape only. Making due allowance for this fact, it would appear that the average production for the season 1899–1900, which was a very unfavourable one, was about 160 gallons in New South Wales, 120 gallons in Queensland, 72 gallons in Western Australia, and 58 gallons in Victoria. Taking an average year, the production for Australia may be set down at 190 gallons.

Compared with the wine production of other countries, that of Australia is certainly trifling, but a growing local demand, and the opening

up of a market in England, where Australian wines have obtained some appreciation, make the prospects of the industry sufficiently promising to encourage a hope that the coming years will witness important developments. In 1898, the latest year for which information is available, the world's production was estimated at 2,716,000,000 gallons, to which Australia only contributed 4,000,000 gallons; while in 1899 the production of Australia decreased to under 3,000,000 gallons.

The following table illustrates the progress made in the export of Australian wine to countries outside of Australasia since 1881. It will be noticed that in 1899, the trade with foreign countries had grown to fifteen times the value in 1881, while the number of gallons exported had also increased very largely. The 1899 figures are, exclusive of Queensland, 74 gallons, valued at £35; and Western Australia, 715 gallons, valued at £254:—

State.	1881.		1891.		1899.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	gallons.	£	gallons.	£	gallons.	£
New South Wales..	13,271	3,520	12,368	2,904	8,297	1,827
Victoria	5,588	2,341	142,294	26,152	316,967	38,995
South Australia	1,751	580	227,681	39,054	417,218	51,514
Australia ...	20,610	6,441	382,343	68,110	742,482	92,336

Including the intercolonial as well as the foreign trade, the exports of each colony during the same years are shown below. The figures for 1899 are exclusive of Queensland, 88 gallons, valued at £39; Western Australia, 715 gallons, valued at £254; and Tasmania, 24 gallons, valued at £27.

State.	1881.		1891.		1899.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	gallons.	£	gallons.	£	gallons.	£
New South Wales..	22,377	7,233	54,143	11,644	32,749	7,597
Victoria	12,544	5,388	160,982	32,516	327,832	43,299
South Australia.....	54,001	12,637	285,107	58,282	496,510	77,773
Australia ...	88,922	25,258	500,232	102,442	857,091	128,669

The total value of the grape crop and the average return per acre in the Australian colonies, for the year 1899, will be found below :—

State.	Total value of crop.	Average value per acre—	
		Of Total Area under Vines.	Of Productive Vines.
	£	£ s. d.	£ s. d.
New South Wales	108,500	13 2 2	15 1 8
Victoria	452,300	16 8 4	18 0 0
Queensland	26,200	13 1 7	15 0 0
South Australia	292,900	15 1 4	17 5 0
Western Australia.....	48,800	15 0 0	.....
New Zealand	6,300	15 0 0	.....
Australasia	935,000	15 9 0	17 4 9

The Government of Victoria has attempted to help the wine industry in that colony by establishing wineries. Under safeguarding regulations it undertook to advance up to £3,000 to each company on its formation, and up to the present £8,600 have been advanced to companies at Rutherglen, Stawell, Mooroopna, and Yarrawonga.

Sugar-cane.

The growth of the cane and the manufacture of sugar are important industries in Queensland and New South Wales; but whilst the climate of the former colony renders the employment of white labour in the field almost impossible, the plantations of the latter are worked, as a rule, without the assistance of coloured labour. The Queensland planters usually combine the functions of cane-growers and sugar-manufacturers; but in New South Wales, where the numerous holdings are, as a rule, small in area, the cane is purchased from the planters, principally by the Colonial Sugar Refining Company, whose various crushing-mills and refinery are fitted with machinery of the most modern character. The importation of coloured labour into Queensland has been renewed under stringent regulations for the protection of the Kanakas. The attempt made in 1891 by the planters to solve the difficult problem as to whether successful sugar-growing is compatible with the employment of white labour, by the introduction of Italian farm-labourers under contract to work in the sugar-plantations for a number of years, was a failure. Japanese immigrants have also been introduced.

The area under cane for the years specified was as follows :—

State.	1864.	1871.	1881.	1891.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales.....	22	4,394	12,167	22,262	22,517
Queensland.....	94	9,581	28,026	50,948	110,657
Total	116	13,975	40,193	73,210	133,174

The progress of the industry has been very rapid, especially in Queensland, the area of suitable land in that colony being very large. The area given above includes all the cane planted, whether cut during the year or not. The following table shows the acreage actually cut during the last five years :—

State.	1895.	1896.	1897.	1898.	1899.
	acres.	acres.	acres.	acres.	acres.
New South Wales..... ...	14,398	18,194	12,936	14,578	9,435
Queensland.....	55,771	66,640	65,432	82,391	79,435
Total	70,169	84,834	78,368	96,969	88,870

The total production of cane in Queensland in 1899 was 1,176,466 tons, equal to 14·8 tons per acre, as compared with 170,509 tons, or 18·1 tons per acre, in New South Wales. The yield of sugar per ton of cane varies, of course, with the density of the juice, but in an ordinary season it may be set down at about 9·5 per cent. in Queensland, and 9·8 per cent. in New South Wales.

The production of sugar from cane crushed during the last five years was as given below. The figures are compiled from the returns made by the mill-owners, and in the case of Queensland it is possible that they show something less than the actual production :—

State.	1895.	1896.	1897.	1898.	1899.
	tons.	tons.	tons.	tons.	tons.
New South Wales.....	22,213	28,557	27,653	29,110	15,352
Queensland.....	86,255	100,774	97,916	163,734	123,289
Total	108,468	129,331	125,569	192,844	138,641

The following table shows the apparent consumption of sugar in each colony during 1899. Queensland was the only province which was able to meet its own requirements, and spare a quantity of sugar for export. The net export from that colony amounted to 109,313 tons, valued at £1,162,359, almost the whole of which was consigned to the other Australasian colonies.

State.	Quantity Manufactured.	Net Import.	Total Consumption of Sugar.
	tons.	tons.	tons.
New South Wales	15,352	41,226	56,578
Victoria	348	45,926	46,274
Queensland	123,289	109,313*	13,976
South Australia	.....	7,079	7,079
Western Australia	.....	8,356	8,356
Tasmania	.....	7,703	7,703
Commonwealth	138,989	977	139,966
New Zealand	.....	30,344	30,344
Australasia	138,989	31,321	170,310

* Net Export.

The quantity shown above does not necessarily represent the total consumption of sugar during the year, because there may have been a surplus available from previous years, which would have the effect of lessening the import during 1899.

The country of origin of 141,930 tons of the sugar which was imported into Australasia during 1899 can be ascertained, and was as shown below. The balance consisted partly of small quantities imported from other countries, but mostly of re-exports, the original port of shipment of which could not be traced from one colony to another. The quantity shown as imported from Europe was probably beet sugar :—

Country of Origin.	Quantity Imported.
	tons.
Queensland	102,413
Mauritius	6,607
Fiji	25,468
Java	4,615
Hongkong	2,158
Europe	669
Total	141,930

The total value of the sugar crop and the average return per acre, in the sugar-growing colonies of Australia, will be found below for the year 1899 :—

State.	Value of Cane grown.	Average Value per Acre.
	£	£ s. d.
New South Wales	89,500	3 19 6
Queensland	529,500	4 15 8

In connection with the prospects of this important industry, the present duties levied on raw sugar are worth recording. They are as follow :—New South Wales, £3 per ton ; Victoria, £6 per ton ; Queensland, £5 per ton ; South Australia, £3 per ton ; Northern Territory, £5 per ton ; Western Australia, free ; Tasmania, £6 per ton ; New Zealand, £4 13s. 4d. per ton.

Sugar-beet.

The question of cultivating the beet-root for the production of sugar, which is now receiving a good deal of attention in Victoria, is not altogether a new one in the history of that colony, for thirty years ago experiments in this direction were made both on the Government farms and by private growers, and the results obtained were deemed to be so satisfactory that it was confidently predicted by the Melbourne press at the time that in a few years the industry would be established on a permanent basis. But the great hopes which were then entertained were not fulfilled, and in 1874 the Secretary for Agriculture reported that the sugar extracted from roots grown experimentally amounted to 7·09 per cent.—a yield which he considered too low to permit of the establishment of a profitable industry. The history of the cultivation of the beet for sugar in other countries, however, has been one of steady progress since the discovery of the saccharine properties of the root in 1747. In Germany, for example, the percentage of sugar extracted from the beets grown in that country averaged but 5·50 per per cent. in 1836, while at the present time the yield is nearly 14 per cent., the increase having been most regular. To the great improvements in the machinery employed in the mills where the beets are treated this notable advance has been most largely due, but to a large extent it is also attributable to the application of science to the cultivation of the root. Under such circumstances as these, the opinion promulgated in the report of the Secretary for Agriculture could not be taken as unfavourable to the prosecution of experiments in Victoria, and a continuation of the efforts of the Department of Agriculture led to the excellent result of an average yield of 18·10 per cent. of sugar obtained from sixty-four samples of beets grown on the Government experimental farms during the year 1893–4, while roots

privately grown have been declared by the Agricultural Chemist to contain 22½ per cent. of sugar.

Such high yields as these have forced the conclusion that these colonies are fitted by nature to become the home of the sugar-beet. Indeed, in New South Wales, analyses made by the Chemist to the Colonial Sugar Refining Company of roots grown in the New England district, where experiments were conducted, disclosed yields ranging from 15·66 to 24·75 per cent. of sugar. There is little fear, therefore, that with proper care and attention, the cultivation of the beet will not produce good results; also, unlike the sugar-cane, the beet is a true agricultural product, and not only does not exclude other crops from the land but on the contrary invites them, and, as general experience has proved, leads to their greater production by vastly increasing the fertility of the soil. The one thing necessary to ensure success is the establishment of large mills for the production of beet sugar, according to the most modern principles. To attempt to start the industry on a small scale is to invite failure, for the cost of production would be too high. The Victorian Minister of Agriculture, in a report on the prospects of establishing the beet-sugar industry, issued at the end of 1894, made this clear, and estimated that with a factory that could turn out 300 tons per day the financial results would be satisfactory, while with one of greater capacity the cost would be correspondingly reduced. The question is not only one of importance to Victoria, which now imports all its sugar, and imports it largely from countries outside Australasia, but to the other colonies as well. At the present time, when the growing of sugar-cane in New South Wales and Queensland is an important industry, the production is by no means equal to the wants of the people of Australasia, and there is therefore sufficient scope for the immediate cultivation of the beet-root for the extraction of sugar. In addition to this, the pulp of beet-root is a very valuable fodder for cattle, so that its cultivation might be pursued in conjunction with dairy-farming.

On 6th March, 1896, the Victorian Parliament passed an Act empowering the Government to assist in the establishment of the sugar-beet industry by granting loans to duly registered public companies which might be formed for the purpose of erecting mills and equipping them with the necessary machinery and plant for the extraction of sugar from the roots. The company applying for aid must satisfy the Treasurer of the colony of certain conditions, and if he were satisfied that these conditions were likely to be fulfilled, and that the company had a paid-up capital of not less than £20,000, he was authorised to advance to the company a sum not exceeding twice the amount raised by its shareholders.

As a result of these concessions a company was formed in Victoria. This company erected a factory at Maffra, at a total cost of £17,200, and the first campaign ended in June, 1898. The cultivation was further persevered with until May, 1900, when the factory was closed down.

The failure of the industry was ascribed to various causes, the principal one being that the supply of beet was not sufficient, since 9,000 tons was the greatest quantity treated in a campaign by the factory, which was capable of treating 40,000 tons. Want of expert knowledge by the farmers in growing beet-root was another cause of failure; the first crop only produced 9 tons to the acre, and the others were even worse. Dry seasons were also blamed, so that, on the whole, the cultivation of beet in Victoria was not a success. The percentage of sugar produced during the three seasons was as follows :—

1897–98	14·0 per cent.
1898–99	11·8 ,,
1899–1900	14·6 ,,

while the sugar produced had a standard of purity of 80 per cent., 76 per cent., and 85 per cent. respectively.

In August, 1898, the Government of Victoria was called upon to assist the company by an advance of £13,000, in addition to the sum of £50,000 to be advanced under the provisions of the Act of 1896, and at present it is seriously considering the question of putting the beet-sugar industry upon a satisfactory basis.

In New South Wales, although, as already stated, portions of the soil, particularly in the New England district, have been demonstrated to be admirably adapted to the cultivation of beet of excellent saccharine properties, no systematic effort has yet been made towards the establishment of the sugar-beet industry on a commercial basis.

Tobacco.

The cultivation of the tobacco-plant has received attention in the three eastern colonies. The following table shows the area and production of tobacco at various periods :—

Year.	New South Wales.		Victoria.		Queensland.		Australasia.	
	Area.	Production.	Area.	Production.	Area.	Production.	Area.	Production.
	acres.	cwt.	acres.	cwt.	acres.	cwt.	acres.	cwt.
1861	224	2,647	220	2,552	..	.....	444	5,199
1871	567	4,475	299	2,307	44	.....	910	6,782
1881	1,625	18,311	1,461	12,876	68	521	3,154	31,708
1888	4,833	55,478	1,685	13,355	123	1,418	6,641	70,251
1891	886	9,314	545	2,579	790	7,704	2,221	19,597
1892	848	8,344	477	658	318	3,808	1,643	12,810
1893	854	10,858	1,057	8,952	475	4,577	2,386	24,387
1894	716	8,132	1,412	7,155	915	9,571	3,043	24,858
1895	1,231	10,548	2,029	15,223	1,061	7,511	4,321	33,282
1896	2,744	27,468	1,264	7,890	994	8,629	5,002	43,987
1897	2,181	19,718	522	3,419	755	5,703	3,458	28,840
1898	1,405	12,706	78	190	617	3,276	2,100	16,172
1899	546	6,641	155	1,365	745	6,551	1,446	14,557

Owing to over-production and the want of a foreign market, the area devoted to tobacco-culture greatly declined from 1888 to 1892, after which it showed signs of development until 1896, but since then has consistently declined. The Australasian tobacco-leaf has not yet been prepared in such a way as to find acceptance abroad, and until such is accomplished it will be useless to expect the cultivation of the plant to become a settled industry. The soil and climate of Australia appear to be suitable for the growth of the plant, but sufficient care and skill have not been expended upon the preparation of the leaf. The quantity of 70,251 cwt. of leaf produced in 1888 was so greatly in excess of local requirements that very low prices only could be obtained, and a large portion of the crop was left upon the growers' hands. The result was that many farmers abandoned the cultivation of tobacco, so that the area under this crop during 1889 was only 3,239 acres in New South Wales, and 955 acres in Victoria, producing respectively 27,724 cwt. and 4,123 cwt. of leaf—less than half the crop of the previous year. In 1891 the area showed a further decline in the case of New South Wales and Victoria. In the mother colony this decline continued until 1894; but in Victoria and Queensland the smallest area devoted to the crop was during the season 1892. The year 1895 saw a great increase in the cultivation of tobacco in all three colonies, and in New South Wales in 1896 there was again a large extension of the area under the plant, although in Victoria and Queensland the advance made in 1895 was not maintained. Since that year the area under cultivation and the production have both steadily declined in each colony until, in 1899, the total production was only 14,557 cwt, the lowest since 1892. In 1898 the crop in Victoria was almost a complete failure.

The average production per acre of tobacco in 1899, and during the ten years ended 1899, were as shown below:—

State.	Average Production per Acre.	
	1899.	1890–99.
	cwt.	cwt.
New South Wales	12·2	10·2
Victoria	8·8	5·9
Queensland	8·8	5·3
Australasia	10·1	8·4

The Agricultural Department of Queensland is endeavouring to assist the tobacco-growers by the importation of American seed of first quality, suited to the Queensland climate, and, following the example set by Victoria and New South Wales, the services of an American expert have been secured. New Zealand, also, has commenced the cultivation

of tobacco, but so far it is only in the nature of an experiment; and a small area has been planted in the Northern Territory of South Australia. In 1897 the Victorian Government decided to grant a bonus of 3d. per lb. on all tobacco-leaf of approved quality grown in the colony, and cured and shipped under the supervision of the tobacco expert. The bonus is only payable to the actual grower of the leaf, and 3 tons have been assigned as the maximum quantity for which payment will be made to any one grower or association.

The following table shows the imports of tobacco, cigars, and cigarettes for home consumption during 1899 :—

State.	Quantity.
	lb.
New South Wales	2,411,135
Victoria	2,277,422
Queensland	887,552
South Australia	678,738
Western Australia	755,299
Tasmania	360,945
Commonwealth	7,371,091
New Zealand	1,731,551
Australasia	9,102,642

The total value of the tobacco crop and the average gross return per acre in the Australian colonies, during the year 1899, are given below :—

State.	Total Value of Crop.	Average Value per Acre.
	£	£ s. d.
New South Wales	8,200	15 0 4
Victoria	1,700	10 19 4
Queensland	8,100	10 17 6
Australasia	18,000	12 9 0

Gardens and Orchards.

The cultivation of fruit in Australasia does not attract anything like the attention it deserves, although the soil and climate of large areas in all the provinces are well adapted to fruit-growing. Still, some progress has been made, especially in recent years. In 1899 the proportion of the total cultivation allotted to fruit was 1·8 per cent., and in 1891

2·1 per cent., while in 1881 the proportion was 1·5 per cent. The area per 1,000 persons, in 1899, was 42·0 acres; in 1891, 36 acres; and in 1881, 29·4 acres. Grapes, oranges, apples, pears, and peaches are the principal fruits grown; but with an unlimited area suitable for fruit-cultivation, and with climatic conditions so varied, ranging from comparative cold in New Zealand and on the high lands of New South Wales and Victoria to tropical heat in Queensland, a large variety of fruits could be cultivated. The industry, however, languishes partly on account of the lack of skill and care on the part of the grower, good fruits commanding high prices, while those placed within the reach of the multitude are generally of lower quality; and partly owing to the lack of means of rapid transit to market at reasonable rates. The inferior quality of much of the fruit produced was due to the ravages of fruit pests. The pests were almost wholly imported from Europe and America on fruit and cuttings, and as the orchards of Australia were threatened, and the fruit industry likely to be seriously interfered with, Acts have been passed in all the colonies prohibiting the importation of diseased fruit. The result of this legislation has been wholly beneficial, and if supplemented by legislation aimed at eradicating diseases existing in the orchards themselves, the future of the fruit industry would be assured. The area under orchards and gardens in 1881, 1891, and 1899 was as follows:—

State.	1881.		1891.		1899.	
	Acres.	Percentage to total area under Crops.	Acres.	Percentage to total area under Crops.	Acres.	Percentage to total area under Crops.
New South Wales	24,565	4·3	40,116	4·7	53,997	2·2
Victoria	20,630	1·4	37,435	1·8	50,312	1·6
Queensland	3,262	2·8	9,758	4·0	12,881	3·1
South Australia	9,864	0·4	14,422	0·7	24,001	1·1
Western Australia	.....	...	.....	...	6,742	3·6
Tasmania	6,717	4·5	10,696	6·4	13,172	5·9
Commonwealth.....	65,038	1·5	112,427	2·1	161,105	1·9
New Zealand	16,360	1·5	29,235	2·0	27,354	1·6
Australasia	81,398	1·5	141,662	2·1	188,459	1·8

With the extension of artificial irrigation and the increased facilities for export afforded by the adoption of cool chambers for the preservation of fruit during long voyages, the orchardists of Australasia are now enabled to compete with foreign States in the fruit supply for the English market, which averages about £8,000,000 in value annually.

The Tasmanian fruit trade with England has passed the experimental stage, and every season large steamers visit Hobart to receive fruit for the home market.

The following table shows the import and export trade of each colony in green fruit and pulp for 1899, from which it will be seen that Tasmania is, as yet, the only colony whose export largely exceeds its import, although in both Queensland and South Australia the exports of domestic produce are now well above the imports :—

State.	Imports.	Exports of Domestic Produce.
	£	£
New South Wales	243,758	97,406
Victoria	78,931	43,772
Queensland	86,621	93,219
South Australia	24,041	32,856
Western Australia	16,721	124
Tasmania	19,143	190,956
Commonwealth	469,215	458,333
New Zealand	99,683	1,536
Australasia	568,898	459,869

The total value of the produce of gardens and orchards and the average return per acre in 1899 were as given below :—

State.	Total Value of Crop.	Average Value per Acre.
	£	£ s. d.
New South Wales	434,100	8 0 9
Victoria	522,000	10 7 6
Queensland	186,900	14 10 2
South Australia	444,500	18 10 5
Western Australia	43,500	6 9 0
Tasmania	152,400	11 11 2
Commonwealth	1,783,400	11 1 5
New Zealand	240,600	8 15 11
Australasia	2,024,000	10 14 10

The average returns per acre have but little value for purposes of comparison, as much depends on the proportion of the areas under certain kinds of fruit and under vegetable gardens, which tends to increase or decrease, as the case may be, the general average of a colony.

In New South Wales the smallness of the average is explained by the fact that in a great number of instances, owing to a lack of facilities for disposing of the fruit crops, the produce of the orchards did not reach the markets, and in some cases was not even gathered. In Tasmania stone fruits are principally grown, and the gross returns from these are much smaller than the returns obtained from the cultivation of sub-tropical fruits such as the orange and citron, which tend to increase the average returns in the continental and northern provinces. In South Australia the large area cultivated as market gardens, which return a greater value per acre than orchards, accounts for the high value of production shown.

Minor Crops.

Besides the crops already specifically noticed, there are small areas on which are grown a variety of products, chiefly rye, bere, onions, beans, peas, turnips, rape, mangold wurzel, and hops; but they are not sufficiently important to warrant special mention, except turnips and rape in New Zealand, where no less an area than 551,250 acres was planted with these crops. The area under minor crops in each province in 1899 was as follows :—

State.	Acres.
New South Wales	13,954
Victoria	22,936
Queensland	18,013
South Australia	5,362
Western Australia	1,212
Tasmania	20,402
Commonwealth	81,879
New Zealand	570,295
Australasia	652,174

In 1899 there were 495 acres under coffee in Queensland, which produced on an average 212 lb. per acre. There were also 431 acres under arrowroot, with an average production of 10·9 tons per acre. Small quantities of cotton, also, are grown in Queensland; and it has been found that heavy crops of cotton can be raised at the Pera Artesian Settlement in New South Wales. In 1897 the South Australian Government granted a lease of Bathurst Island, comprising an area of 500,000 acres, to a syndicate, which proposes to plant india-rubber trees on a large scale.

Dissemination of Agricultural Knowledge

Although considerable progress has of late years been made in some directions, yet it must be admitted generally that agriculture in the Australasian colonies has only now passed the tentative stage. The typical Australian agriculturist, relying largely on a bountiful Nature, does not exercise upon his crops anything approaching the same patience, care, and labour that are bestowed by the European cultivator, nor as a rule does he avail himself of the benefits of scientific farming and improved implements to the extent that prevails in America and Europe. It may be expected that improvements will take place in this respect, and that the efforts made by the Governments of the various colonies for the promotion of scientific farming will bear good fruit. In most of the provinces, agricultural colleges and model farms have been established, and travelling lecturers are sent to agricultural centres. At present New South Wales possesses the Hawkesbury Agricultural College and experimental farm, and the experimental farms at Wagga, Wollongbar, Bathurst, Coolabah, and the Pera Bore. Victoria has the two agricultural colleges of Dookie and Longerenong, with experimental farms attached to them, and another farm at Framlingham, together with a viticultural college at Rutherglen. South Australia has an agricultural college and experimental farm at Roseworthy. The Queensland Government established an agricultural college and farm at Gatton in 1896. By a change in the distribution of the money voted for State scholarships, four bursaries have been allotted, entitling the holders to free board and instruction for a period of three years as resident students of the college. New Zealand possesses an agricultural college and an experimental farm at Lincoln, in Canterbury.

In New South Wales experimental cultivation by means of irrigation with artesian and catchment water has been successfully conducted at some of the tanks and bores owned by the State, notably at the Pera Bore. In South Australia a central agricultural bureau in Adelaide, with about eighty branch bureaus in the country, assists the farmers by disseminating valuable information, publishing papers, introducing new economic plants, and improving the breed of dairy cattle. A State school has been established in Adelaide for the purpose of affording instruction to "secondary agricultural pupils." The fees paid by the scholars, who must be over 13 years of age and have passed the compulsory examination, are at the same rate as those paid in the ordinary State schools. In Tasmania, the Council of Agriculture gives valuable advice to farmers concerning improved methods of agriculture, extermination of insect pests, etc.; while Western Australia possesses seventeen agricultural halls subsidised by the Government, where the latest literature of interest to farmers may be examined, and where lectures are delivered on agricultural subjects.

State Advances to Farmers.

The oldest system by which advances of money are made to farmers is probably that which was established, as early as 1770, by the German "Landschaften Bank"; and the principle, assuming different forms according to the circumstances of the countries into which it was introduced, was gradually extended to the other great countries of Europe, with the exception of the United Kingdom, where an unwieldy system of land transfer, and the growing accumulation of large estates, form obstacles in the way of its successful application. Since 1849, mainly by the efforts of Raiffeisen, the German Land Credit Banks have taken the form of purely co-operative institutions, and in this respect they have been followed by Sweden, the Baltic provinces of Russia, and Poland, as well as, to some extent, by Austria-Hungary; but in most of the European countries the institutions may be classed as partly State and partly co-operative. In France alone is the system exclusively administered by the State; and it is the French *Credit Foncier* which has been adopted in Australasia wherever the idea of rendering financial aid to agriculturists has been carried into effect, namely, in the colonies of New South Wales, Victoria, South Australia, Western Australia, and New Zealand; while in Queensland and Tasmania the system has received consideration.

It was not till very recently that New South Wales adopted the principle of advances to settlers. Act No. 1, of 1899, was passed to assist settlers who were in necessitous circumstances, or who were financially embarrassed owing to the droughts. Under this Act a Board was appointed to consider applications for relief, and determine whether such relief should be granted. No advance to any settler is to exceed £200, which is to be repaid in ten years at 4 per cent. per annum. Up to 3rd October, 1900, 4,393 applications had been received for advances, the amount applied for being £377,000. Of these applications, 4,251 have been dealt with by the Board, and 1,564 have been refused. The number of applications approved is 2,687, representing advances to the amount of £193,037. Repayments of principal amount to £9,773, in addition to which £2,948 has been received in interest. The Government has in contemplation the introduction of a scheme somewhat on the lines followed in Victoria, in which the system will be carried on in connection with the Savings Bank.

In Victoria, a section of the Savings Banks Act of 1890 empowered the Commissioners to entertain applications for loans, and to lend sums of money on security by way of mortgage of any lands and hereditaments held in fee-simple free of all prior charges, quit-rents excepted, at such rate of interest as might, from time to time, be fixed by them. The conditions were not very liberal, but they endured for a number of years. Five per cent. was the rate of interest charged, and 2 per cent.

was payable annually in redemption of the principal. Opportunity was taken in the Act for the amalgamation of the Savings Banks, assented to on the 24th December, 1896, to definitely grant advances to farmers under the land-credit system. Under the new Act the Commissioners of Savings Banks are empowered to assist farmers, graziers, market-gardeners, or persons employed in agricultural, horticultural, viticultural, or pastoral pursuits, by making advances, either by instalments or otherwise, upon the security of any agricultural, horticultural, viticultural, or pastoral land held by them, either in fee simple, or under a lease from the Crown in which the rent reserved is taken in part payment of the purchase money of the land demised by such lease. The Commissioners have the option of making such advances either in cash or in mortgage bonds; and it is provided that all advances, together with interest at the rate of 4½ per cent. per annum, are to be repaid in sixty-three half-yearly instalments, or such smaller number as may be agreed upon by the Commissioners and the borrower. From the commencement of the Act to the 30th June, 1899, the Commissioners approved 2,035 applications for loans, aggregating a sum of £914,265. The actual advances made during the financial year 1898–99 amounted to £262,290, of which £231,663 was advanced to pay liabilities, £12,806 to pay Crown rents, and £17,821 to improve resources of land, and to carry on. To enable them to make the necessary advances the Commissioners had sold Treasury bonds to the nominal value of £768,550.

The South Australian Parliament, on the 20th December of that year, passed the State Advance Act of 1895, providing for the establishment of a State Bank for the purpose of making advances to farmers and producers, to local authorities, and in aid of industries, on proper security, consisting either of lands held in fee simple or under Crown lease; the funds for this purpose to be raised by the issue of mortgage bonds guaranteed by the State. The rate of interest was to be a matter of arrangement between the bank and the borrower, the maximum being 5 per cent. per annum. To the 31st March, 1900, the South Australian State Bank, thus established, had advanced £529,881, and received repayments to the amount of £75,329. On that date there were arrears of interest to the amount of £245 outstanding; and £5,608 interest had accrued and become due on the 1st April. In order to enable these advances to be made, mortgage bonds had been sold to the amount of £531,200, of which £77,000 had been repurchased, leaving the amount current at £454,200. The advances made during the financial year 1899–1900 amounted to £65,729.

In Western Australia the Agricultural Bank Act of 1894 authorised the establishment of a bank for the purpose of assisting persons in the occupation, cultivation, and improvement of agricultural lands. Under the provisions of the Act the manager of the bank is empowered to make advances to farmers and other cultivators of the soil on the security of their holdings in fee simple, or under special occupation

lease, or under conditional purchase from the Crown, or under the Homestead Farms Act of 1893. The advances are granted either for the purpose of making improvements on unimproved holdings, or of making additional improvements on holdings already improved, and, under the original Act, could not exceed in amount one-half of the fair estimated value of the improvements proposed to be made. The maximum rate of interest chargeable was fixed at 6 per cent. per annum payable half-yearly, and it was provided that the largest sum to be advanced to any one person shall be £400. Repayment is made in half-yearly instalments of one-fiftieth of the principal sum, to commence on the 1st January or the 1st July next following the expiration of five years from the date of the advance, until the whole amount is repaid with interest. Arrangements can, however, be made for the repayment of advances at shorter intervals, and in larger instalments. For the purposes of the Act, improvements were defined as clearing, cultivating, and ringbarking; but by an Amending Act passed in 1896 the term was extended so as to include fencing, drainage works, wells of fresh water, reservoirs, buildings, or any other works enhancing the value of the holding. The same Act raised the largest sum which can be advanced to £800, reduced the maximum rate of interest to 5 per cent., made provision for the acceptance of pastoral leases as security, and allowed advances to be made up to three-fourths of the estimated value of the proposed improvements. The capital allotted to the Agricultural Bank is £100,000; and to the 30th June, 1900, loans to the amount of £110,395 from 1,039 applicants had been approved. During the financial year 1899–1900, advances to the amount of £12,580 were approved.

In New Zealand the Government Advances to Settlers Act of 1894 provided for the establishment of an Advances to Settlers Office, empowered to lend money on first mortgages of land occupied for farming, dairying, or market-gardening purposes, urban and suburban lands used for residential or manufacturing purposes being expressly excluded from the scope of the Act. At that time one class of loans only was contemplated, viz., loans on mortgage security, which were repayable by seventy-three half-yearly instalments, subject, however, to redemption at any time; but by an Amending Act passed in 1896 authority was given for the granting of fixed loans for any term not exceeding ten years. These loans can only be granted on freehold lands, and are repayable without sinking fund at the end of the period for which they are made. The amount advanced on fixed loan is not to exceed one-half the estimated value of the security; while under the instalment system the Board of Control has power to grant loans up to 60 per cent. of the realisable value of freehold securities, and up to 50 per cent. of the lessee's interest in leasehold securities. In both cases interest is fixed at the rate of 5 per cent. per annum, and the amount advanced cannot be less than £25 nor more than £3,000—the maximum under the 1894 Act having been £2,500. Instalment loans are repayable in 36½

years, in half-yearly payments, at the rate of 5 per cent. for interest and 1 per cent. in redemption of the principal sum. The first meeting of the General Board for the purpose of considering applications for loans was held on 23rd February, 1895; and up to 31st March, 1900, the Board had authorised 8,452 advances, amounting to £2,633,440. The total amount applied for in the 8,452 applications granted in full, or in part, was £3,012,870. 1,004 applicants declined the partial grants offered to them, amounting to £454,000; so that the net advances authorised at 31st March, 1900, numbered 7,448, and amounted to £2,179,440. The security for the advances authorised was valued at £4,359,983. The number of applications received up to 31st March, 1900, was 10,995, and the amount applied for, £3,711,033.

Artesian Wells.

The necessity of providing water for stock in the dry portions of the interior of the Australian continent induced the Governments of the colonies to devote certain funds to the purpose of sinking for water, and bringing to the surface such supplies as might be obtained from the underground sources which geologists stated to exist in the tertiary drifts and the cretaceous beds which extend under an immense portion of the area of Central Australia, from the western districts of New South Wales to a yet unknown limit into Western Australia.

In New South Wales the question of the existence of underground water had long been a subject of earnest discussion, but doubts were set at rest in 1879 by the discovery on the Kallara Run, at a depth of 140 feet, of an artesian supply of water, which, when tapped, rose 26 feet above the surface. The Government then undertook the work of searching for water, and since the year 1884 the sinking of artesian wells has proceeded in a scientific and systematic manner, under the direction of specially-trained officers. Private enterprise, which had shown the way, has also followed up its first successes.

Up to 1900 the Government of New South Wales had undertaken the sinking of eighty-eight wells; of these, eighty-two have been completed, and six are in progress. Of the completed wells, fifty-six are flowing, eighteen are sub-artesian, yielding pumping supplies, one has ceased flowing, being choked, and seven have been failures; these wells represent 135,160 feet of boring, while with the uncompleted wells the total depth bored has been 151,249 feet. From the completed wells about 32,700,000 gallons of water flow every day to the surface. The deepest bore completed is that at the Dolgelly, on the road from Moree to Boggabilla, where boring has been carried to a depth of 4,086 feet; this well yields a supply of approximately 745,200 gallons per diem. The largest flow obtained in the colony is from the Kenmare Bore, on the road from Bourke to Hungerford; the depth of this well is 1,539 feet, and the estimated flow about 2,050,000 gallons per diem. Another important bore is that at Pera, 8 miles from Bourke, on the Wanaaring

road, where at a depth of 1,154 feet a flow of 300,000 gallons per diem is obtained. At this bore the most extensive system of irrigation by artesian water as yet undertaken in the colony is being carried out. An area of 57 acres has been set apart for experimental cultivation by the Government, and certain fruits and other products indigenous to the temperate and torrid zones are being grown with success. Equally good results have been obtained at Native Dog, Barringun, Enngonia, and Belalie bores, on the road from Bourke to Barringun. Lucerne, maize, wheat, tobacco, millet, planter's friend, sugar-cane, date palms, pineapples, bananas, and many other fruits and vegetables of tropical and sub-tropical character have been found to thrive there exceedingly well.

On the road from Wanaaring to Milparinka, once a waterless track, successful boring operations have been carried on. Seven bores have been completed. Four of these give a pumping supply, and two are flowing, yielding an aggregate supply of 2,300,000 gallons daily, and the other is choked and has ceased flowing. Boring operations have been extended farther to the north-west, and two bores have been sunk at Paldrumata and Ocarnoo on the Wilcannia to Wampah-road. These two bores are sub artesian, and yield pumping supplies at depths of 780 and 1,359 feet respectively. Another bore is in progress at Warri Warri. A remarkable flow has also been obtained at the Moree bore, amounting to 1,108,000 gallons daily. This bore has been carried to a depth of 2,792 feet, through formations of the same age as the Ipswich coal measures (*Trias Jura*), thus demonstrating the fact that water can be obtained in other than the lower cretaceous formation.

Much has been done in the way of artesian boring by private enterprise. As far as can be ascertained, 128 private bores have been undertaken in New South Wales, of which 16 were failures, 2 were abandoned and one is in progress. Amongst the most important are two wells on Lissington Holding, one with a flow of 4,000,000 gallons and the other with 3,000,000 gallons per day; one at Cuttabulla (Lila Springs), with a daily flow of 4,000,000 gallons; one at Toulby with 3,500,000 gallons per day; and one at Goondabluie with 3,000,000 gallons per day. From the private wells approximately 45,000,000 gallons are discharged daily.

A better idea of the value of artesian wells to the community will be obtained when it is known that the aggregate daily flow of underground water in New South Wales is now approximately 78,000,000 gallons, and that, in addition, large supplies can be pumped from sub-artesian wells. The average depth of the eight-two wells completed by the Government is 1,648 feet 4 inches, with a range from 120 to 4,086 feet, while the temperature of the water varies from 80 to 139 degrees Fahrenheit. The total cost of the wells (including actual boring, casing, carriage, and incidental expenses) was £243,938 4s. 7d., or an average of £2,973 12s. 9d. per bore, or £1 16s. 1d. per foot.

The latest information available regarding the artesian water supply of Queensland extends only to 30th June, 1898, when the Hydraulic Engineer reports that 41 bores had been completed by the Water Supply

Department, of which 16 were successful, one gave a pumping supply, and 24 had been abandoned, or their progress was uncertain. In addition 11 bores had been sunk by the Railway Department of which 2 were successful; and 10 by Local Government authorities of which 5 were successful. Private bores to the number of 582 had also been undertaken, and of these 356 were attended with success, and 157 were abandoned or their progress was uncertain. The total daily flow of the Government bores is given at 8,400,000 gallons, and the total continuous yield from 376 bores, Government and private, at 213,953,000 gallons, in addition to which 55 sub-artesian wells have 24,950,000 gallons of water pumped from them daily. The deepest Government bore is at Winton, and reaches 4,010 feet, while the most copious supply, namely, 3,000,000 gallons per day, is obtained at the Charleville bore. The deepest private bore, and also the deepest bore in the Colony, is the Bothwell on the Bimerah run, and reaches 4,860 feet. The largest supplies are obtained from four bores on the Boatman and Elmina runs, two of which yield 3,000,000 gallons each, one yields 3,500,000 gallons, and the other 4,000,000 gallons daily. The Goora and Horton Vale bores in the Cunnamurra and Euro district also yield 4,000,000 gallons per day. The total depth bored up to 30th June, 1898, was 717,912 feet, the average depth per bore being 1,177 feet nearly. At Back Creek and No. 3 bore, Bingara, water of so low a temperature as 70 degrees Fahrenheit was flowing; while at Dagworth, the water had a temperature of 196 degrees. Large areas are served by the water from the bores for irrigation purposes, the total at the middle of 1898, according to the returns received being 5,229 acres, of which 4,199 acres were under sugar-cane; and in addition several stations, which made no returns, also used the water for purposes of irrigation.

At the end of 1897, the latest date for which any information is available, the Water Conservation Department of South Australia had completed eighty-seven bores, of which, however, only thirty-three were successful. These are spread over widely-distant parts of the territory, successful bores existing at Nullarbor Plains, on the boundary of Western Australia; at Oodnadatta, the present terminus of the Northern Railway system; and at Tintinara, in the south-eastern extremity of the colony. The bore at Tintinara has proved that the marine tertiary area is water-bearing. For purposes of water conservation, the colony may be divided into four large areas, namely, the West Coast division, where 12 bores were attempted and 3 were successful; the Far North and North-west division, where 13 out of 32 bores were successful; the Central division, where 15 out of 39 bores were a success; and the South-east division, where 2 out of 4 bores were successful. Of the bores on the west coast, Robert's Well No. 1, on Nullarbor Plains, reaches a depth of 777 feet, and gives a daily supply of 68,000 gallons; the total supply from the three flowing wells being 133,000 gallons. Much greater depths have been reached in the far north; a well at Kopperamanna being the deepest in the colony, viz., 3,000 feet.

This well gives a daily supply of 800,000 gallons. A well at Strangways, and another at Coward, give daily supplies of 1,200,000 gallons each—the maximum obtained in South Australia. The flowing bores in this division gave a daily yield of 3,928,200 gallons. The wells in the central area are much less important, the largest supply, viz., 108,000 gallons daily, being obtained from one in the vicinity of Gawler. The deepest well in this division is situated at Percyton, and reaches 930 feet. The total daily supply in the central area amounts to 354,400 gallons. The two successful wells in the south-east have a daily outflow of 34,000 gallons. The total daily supply for the whole colony reaches, therefore, 4,449,600 gallons. According to a report by the engineer-in-chief, it would appear that the South Australian Government had expended £19,202 on machinery and £148,689 in boring operations, or a total of £167,891, at the end of the year 1897.

The Government of Western Australia, following the example set by those of the eastern colonies, has sunk a number of wells in the direction of the Coolgardie gold-field, and of the South Australian border, and has let contracts for others. So far as official data show, there were at the end of 1899 sixteen artesian wells in the colony, reaching an aggregate depth of 14,165 feet, and yielding a total flow of 4,806,500 gallons per diem. In addition to these, there are three sub-artesian wells of an aggregate depth of 2,511 feet, from which 531,700 gallons of water can be pumped daily. The deepest bore, 1860 feet, is at South Perth. The municipal bore at Guildford has the largest yield, viz., 1,120,000 gallons per day.

In the province of Victoria the Government has since the year 1886 executed several experimental borings, but so far the results have not been encouraging. Artesian water was, however, struck at Sale, in Gippsland, as early as the year 1880, but the bore is not now used.

It is unfortunate that later information than that quoted in regard to some of the colonies, notably Queensland and South Australia, cannot be given; but there seems to be a singular apathy on the part of the Departments concerned in all the colonies in publishing reports on this most important service. The statistics are presented for the two above-named colonies for the dates referred to, as it is probable that no great amount of work has been carried out during the last year or two in the direction of boring for artesian water.