AGRICULTURE.

TAKEN as a whole, Australasia may be said to be just emerging from the first phase of agricultural settlement; indeed, some of the states have not yet wholly passed from the pastoral stage. Nevertheless the value of agricultural produce, estimated at farm prices, is considerable, and amounts to over 50 per cent. of the value of the pastoral and dairy produce. The production from agriculture in each state for the year 1903, given below, is the largest yet recorded, and is over £5,000,000 in excess of the average for the five preceding years. The wheat crop alone was valued at over £12,000,000, of which some £5,000,000 worth was exported to countries outside Australasia during the first nine months of 1904.

State.	Total value of Crops in 1903.	Average Value of Produce per acre.	Proportion of Total Value.
	£	£ s. d.	per cent.
New South Wales	8,359,000	3 5 9	24·54
Victoria	10,156,000	2 19 11	29·82
Queensland	2,059,000	3 12 8	6·05
South Australia	4,030,000	1 15 9	11·83
Western Australia	923,000	3 5 1	2·71
Tasmania	1,265,000	4 17 5	3·72
Commonwealth	26,792,000	2 17 7	78·67
New Zealand	7,266,000	4 3 10	21·33
Australasia	34,058,000	3 1 8	100·00

From this estimate it would seem that the value of crops per acre cultivated is larger in Queensland and Tasmania than in the other states of the Commonwealth, a fact which is due to the proportionately large area under sugar-cane in the former state, while in Tasmania the area devoted to fruit accounts 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 states, and the small area devoted to the plough returns on an average a better price per acre than in some of the states where agriculture has received greater attention. In point of gross value, Victoria occupies the first position among the members of the Commonwealth group, the produce of that province having a value of over one-fourth of that of all Australasia. The high position of Victoria is in great measure due to the large return from wheat, potatoes, oats, and hay. New Zealand produces over one-fifth while New South Wales, chiefly owing to its magnificent wheat harvest, occupies second place on the list with slightly under one-fourth of the total. The average value of the principal crops, and the percentage of each to the total production for 1903, are given in the following statement:—

Name of Crop.	Value.	Proportion to Total.
	£	per cent.
Wheat	12,016,000	35·3
Maize	1,073,000	3·2
Barley	460,000	1·4
Oats	3,072,000	9·0
Hay	8,194,000	24·0
Grass seed	230,000	0·7
Potatoes	1,190,000	3·5
Grapes	885,000	2·6
Hops	49,000	0·1
Tobacco	13,000	0·0
Sugar-cane	787,000	2·3
Orchards	1,323,000	3·9
Market Gardens	906,000	2·7
Green forage	589,000	1·7
Other crops (other grain, root, &c.)	3,271,000	9·6
Total	34,058,000	100·0

The principal crop is wheat, which returned 35·3 per cent. of the total value, hay coming next with 24 per cent. "Other" crops returned the large sum of £3,271,000—9·6 per cent.—to which, New Zealand alone contributed £2,521,000, the high value of the production in that province 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 provinces during the year 1903 is represented by the following figures. It will be seen that South Australia shows the highest value, followed in order by New Zealand, Victoria, Tasmania, and New South Wales. The lowest positions are occupied by Western Australia and Queensland with a value of less than half that of South Australia. Comparisons of this kind are however somewhat

misleading, as the main consideration is the extent of employment afforded by the industry and the return to the persons engaged therein.

State.	Average value per head. £ s. d.
New South Wales	5 17 6
Victoria	8 7 10
Queensland	3 19 5
South Australia	10 19 6
Western Australia	4 3 10
Tasmania	7 1 9
Commonwealth	6 16 9
New Zealand	8 17 2
Australasia	7 3 9

Below will be found the value of the agricultural production of the Commonwealth and New Zealand in the years 1871, 1881, and 1891. Comparing these figures with those given above, it will be seen that while the total production of Australasia now averages nearly £14,000,000 more than in 1881, the average value per head has declined 1s. 6d. whereas compared with 1891, the average shows an increase of £1 9s. 3d. per head. As subsequent tables will show, a decrease in prices, and not want of productiveness, was responsible for the decline in value since 1881. The fall in prices, especially of wheat, was very rapid down to 1895; for the next three years there was a very material increase; in 1899 they fell again to the 1895 level, but in 1901 there was a more or less general increase; while towards the close of 1902, and almost up to the close of 1903, the effects of the adverse season were acutely felt, and prices rose to double those of the previous year. At the end of 1903, when the heavy crops began to come in, prices again fell, but they were nevertheless higher than the 1901 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
	Per head	£ s. d. 5 12 8	£ s. d. 7 5 3	£ s. d. 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 provinces, such as South Australia, New Zealand, and Tasmania, show averages which surpass those 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	Australasia (average		
Denmark	19	8·6	for years 1898–1903)	30	6·5

Area under Cultivation.

The following figures, giving the total extent of land in cultivation in each of the Commonwealth states and New Zealand at different periods since the year 1871, will serve to illustrate the progress which agriculture has made. In this table, and in the others which follow, the period represented extends from the 1st April in the year named to the 31st March of the following year. It must be understood that the areas under grass for pasturage, whether indigenous or artificially sown, are not included amongst the acreage set down as under cultivation ;—

State.	1871.	1881.	1891.	1901.	1903.
	acres.	acres.	acres.	acres.	acres.
New South Wales	390,099	578,243	846,383	2,276,528	2,542,919
Victoria	851,354	1,435,446	2,116,654	2,965,681	3,389,069
Queensland	59,969	117,664	242,629	483,460	566,589
South Australia	837,730	2,156,407	1,927,689	2,236,552	2,256,824
Western Australia	51,724	53,353	64,209	216,824	283,752
Tasmania	155,046	148,494	168,121	232,550	259,611
Commonwealth	2,345,922	4,489,607	5,365,685	8,411,595	9,298,764
New Zealand	337,282	1,070,906	1,424,777	1,713,799	1,734,127
Australasia	2,683,204	5,560,513	6,790,462	10,125,394	11,032,891

The 1,734,127 acres under crop in New Zealand as shown above, include 77,167 acres of grass land cut for hay, and 68,041 acres of clover and grass cultivated for seed.

In 1861, the cultivated area in Australasia was 1,337,548 acres, so that the extent of land under crop is now over eight times as large as it was in that year. If, however, the land artificially grassed be included, the total for 1903 will reach 24,741,034 acres, or more than eighteen times the area in cultivation in 1861. A comparison of the acreage under crop on the basis of population, may perhaps best serve to give an idea of the progress of agriculture, and this is shown in the table given below. South Australia still holds, as it has done for many years, the first position, followed at a long interval by Victoria and New Zealand.

State.	1861.	1871.	1881.	1891.	1901.	1903.
	acres.	acres.	acres.	acres.	acres.	acres.
New South Wales	0·7	0·8	0·8	0·7	1·7	1·8
Victoria	0·8	1·1	1·7	1·8	2·6	2·8
Queensland	0·1	0·5	0·5	0·6	1·0	1·1
South Australia	3·2	4·5	7·5	5·9	6·2	6·1
Western Australia	1·6	2·0	1·8	1·2	1·2	1·3
Tasmania	1·8	1·5	1·2	1·1	1·3	1·5
Commonwealth	1·1	1·4	2·0	1·6	2·2	2·4
New Zealand	0·7	1·3	2·1	2·2	2·2	2·1
Australasia	1·1	1·4	2·0	1·7	2·2	2·3

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

Increase of—	1861-71.	1871-81.	1881-91.	1891-1901.
	per cent.	per cent.	per cent.	per cent.
Acreage under crop	100·6	107·2	22·1	47·6
Population	55·6	43·2	38·1	21·3

Although during the period of forty-two years the population of Australasia was nearly quadrupled, the area of land devoted to agriculture increased over ninefold, and the rate of agricultural progress was more than twice that of the population. The chief progress was made during the twenty years from 1861 to 1881, and the ten years from 1891 to 1901. During the period intervening from 1881 to 1891 the population increased nearly twice as rapidly as the agricultural industry.

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. It was not to be anticipated that the same rate of progress could be maintained, and the comparative decline in the eighties may be accounted for by the fact that most of the best land had been taken up. The earnest attempts of the state to assist the agriculturist in obtaining land on easy terms, however, together with the satisfactory advance in the price of wheat during the three years 1896–98, enabled the industry to show a substantial rate of progress during the ten years prior to 1902, when, although the area under crop was greater than in the previous year, the return was small.

In the following table will be found the proportion of land under crop to the total area of each state, and the same with regard to Australasia as a whole. In instituting comparisons between the several states, however, it must be borne in mind that circumstances other than the mere area in cultivation require to be taken into consideration. It would not be fair, for instance, to compare Tasmania, which has 6·85 persons per square mile, with Western Australia, which has only 0·23 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.	1901.	1903.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
New South Wales	0·15	0·20	0·29	0·44	1·14	1·28
Victoria.....	0·73	1·51	2·55	3·76	5·27	6·03
Queensland	0·001	0·01	0·03	0·06	0·11	0·13
South Australia	0·07	0·15	0·37	0·33	0·39	0·39
Western Australia	0·006	0·008	0·009	0·01	0·03	0·05
Tasmania	0·97	0·92	0·88	0·99	1·39	1·55
Commonwealth	0·07	0·12	0·24	0·28	0·44	0·49
New Zealand	0·10	0·50	1·60	2·13	2·56	2·59
Australasia	0·07	0·14	0·28	0·34	0·51	0·56

Between the years 1870 and 1890 the area under crop in Tasmania remained almost stationary, the total in 1870 being 157,410, and in 1890, 157,376 acres. In the latter year the value of agricultural production was £962,751. From 1890 to 1903 the development of the agricultural industry has been rapid; in the latter year the area under crop had increased to 259,611 acres, and the value of production to £1,265,000; the acreage increasing by 102,235 acres, and the value of the yield by £302,000 during the period dealt with.

The subjoined table shows the proportion of cultivated area devoted to the principal crops in each province, during the year 1903. 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, Queensland, South Australia, and Western Australia. Maize and sugar-cane also form a large proportion of the total in Queensland, while the principal crop in New Zealand is oats. In Tasmania only 19 per cent. of the land cultivated was under wheat, the area cut for hay forming 25·8 per cent. of the total acreage. The proportion under orchards, 5·5 per cent., is higher than that shown by any other state. "Other crops" show a high proportion in the New Zealand returns, chiefly due to the extensive planting of turnips, rape, and other green crops as fodder for sheep.

Crop.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Commonwealth.	New Zealand.	Australasia.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Wheat	61·3	58·1	24·4	75·8	48·6	19·0	59·8	13·3	52·5
Maize	3·9	0·4	23·5	....	0·1	....	4·0	0·6	3·5
Barley	0·4	1·4	4·0	1·3	1·3	3·1	1·3	2·0	1·4
Oats	2·0	12·8	0·5	2·6	5·1	23·4	6·7	22·6	9·2
Potatoes	0·8	1·4	1·2	0·4	0·6	11·2	1·2	1·8	1·3
Hay	19·5	21·6	13·8	16·4	38·4	25·8	20·0	16·7	19·4
Vines	0·4	0·8	0·4	1·0	1·2	....	0·7	0·0	0·6
Sugar-cane ..	0·8	....	19·7	....	....	....	1·4	....	1·2
Orchards	1·9	1·5	2·3	0·8	2·8	5·5	1·7	1·6	1·7
Other crops..	4·0	2·0	10·2	1·7	1·9	12·0	3·2	41·4	9·2
Total	100·0	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, orchards, and "other crops" formed 12·7 per cent. of the whole in 1903, as compared with 8·6 per cent. in 1861 :—

Product.	1861.	1871.	1881.	1891.	1901.	1903.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Wheat	53·6	51·4	60·7	55·0	52·7	52·5
Oats	10·6	13·5	7·9	8·4	8·7	9·2
Maize	4·6	5·3	3·0	4·3	3·3	3·5
Barley	2·2	2·3	1·9	1·4	1·0	1·4
Potatoes	4·2	3·0	1·8	2·0	1·4	1·3
Hay	16·2	11·9	15·1	16·0	17·6	19·4
Vines	0·5	0·7	0·3	0·7	0·6	0·6
Sugar-cane	.....	0·5	0·7	1·1	1·3	1·2
Other crops	8·1	11·4	8·6	11·1	13·4	10·9
Total	100·0	100·0	100·0	100·0	100·0	100·0

WHEAT.

With the exception of Queensland and Western Australia, all the states during 1901 produced sufficient wheat for their own requirements, and in good seasons there is a large and steadily increasing balance available for export, which finds a ready market in Great Britain, where Australian wheat is well and favourably known. For the season 1903–4, the crop was a record one, the total yield being over 82,000,000 bushels, which is slightly in excess of the last Canadian harvest. Taking Australasia as a whole, the wheat exports during the current year have reached about 35,000,000 bushels, valued at some £5,000,000.

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

State.	1861.	1871.	1881.	1891.	1901.	1903.
	acres.	acres.	acres.	acres.	acres.	acres.
New South Wales	123,468	154,030	221,888	356,666	1,392,070	1,561,111
Victoria	196,922	334,609	926,729	1,332,683	1,754,417	1,968,599
Queensland	392	3,024	10,958	19,306	87,232	138,096
South Australia	310,636	692,508	1,768,781	1,552,423	1,743,452	1,711,174
Western Australia	13,584	25,697	21,951	26,866	93,707	137,946
Tasmania	58,823	63,332	51,757	47,584	44,084	49,414
Commonwealth	703,825	1,273,200	3,002,064	3,335,528	5,114,962	5,566,340
New Zealand	29,531	108,720	365,715	402,273	163,462	230,346
Australasia	733,356	1,381,920	3,367,779	3,737,801	5,278,424	5,796,686

It will be seen that, during the twenty years extending from 1861 to 1881, all the states, 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 1903 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 price of wheat which was taken advantage of by the agriculturists of all the states, excepting South Australia and Tasmania. In these two states there were decreases in acreage, although the falling-off was partly due to the unfavourable seasons. In Australasia, as a whole, the increase in area since 1881 amounts to 2,428,907 acres—but while New South Wales shows an extension of cultivation during the period amounting to 1,339,223 acres, and Victoria an increase of 1,041,870 acres, the total increase was reduced by the falling off mentioned above. At present more than one-half of the land in cultivation is devoted to wheat-growing, and in an ordinary season the produce of 1,000,000 acres is available for export to Europe.

The production of wheat at intervals since 1871 was as follows :—

State.	1871.	1881.	1891.	1901.	1903.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	2,229,642	3,405,966	3,963,668	14,808,705	27,334,141
Victoria	4,500,795	8,714,377	13,629,370	12,127,382	28,525,579
Queensland	36,288	39,612	392,309	1,692,222	2,436,799
South Australia	3,967,079	8,087,032	6,436,488	8,012,762	13,209,465
Western Australia	345,368	153,657	288,810	933,101	1,876,252
Tasmania	847,962	977,365	930,841	963,662	767,398
Commonwealth.....	11,927,134	21,378,009	25,641,486	38,537,834	74,149,634
New Zealand.....	2,448,203	8,297,890	10,257,738	4,046,589	7,891,654
Australasia	14,375,337	29,675,899	35,899,224	42,584,423	82,041,288

The adverse weather conditions which prevailed over the greater part of Australia caused the wheat crop of 1902 to fall far below expectations; but the crop for 1903 exceeded all previous records. In New Zealand the harvest was also a good one, the yield being at the rate of over 34 bushels per acre, an increase of nearly 10 bushels on the average of the year 1901.

The greatest increase in production between 1881 and 1901 is shown by New South Wales, which in 1901 produced nearly 11,000,000 bushels more than in 1891, and from the following statement, which gives the proportion of the total crop produced by each state in 1881, 1891, and 1901, 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 1901 it produced nearly 35 per cent. Victoria and New

Zealand show the largest declines during the period, the proportions falling from 38 per cent. and 28·6 per cent. in 1891 to 28·5 per cent. and 9·5 per cent. respectively in 1901 :—

State.	1881.	1891.	1901.
	per cent.	per cent.	per cent.
New South Wales	11·5	11·0	34·8
Victoria	29·4	38·0	28·5
Queensland	0·1	1·1	3·9
South Australia	27·2	17·9	18·3
Western Australia	0·5	0·8	2·2
Tasmania	3·3	2·6	2·3
New Zealand	28·0	28·6	9·5
Australasia	100·0	100·0	100·0

According to the latest estimates the world's production of wheat in 1903 reached 389,350,000 quarters, of which Australasia produced a little over 10,000,000 quarters. The figures for each country are appended :—

Country.	In Quarters of 480 lb.	Country.	In Quarters of 480 lb.
Europe—	000's omitted.	Africa—	000's omitted.
Russia	63,500	Algeria	3,000
France	42,000	Egypt	1,500
Hungary	21,700	Tunis	1,000
Germany	16,500	Cape Colony	500
Italy	20,000		
Spain	12,500	Total	6,000
United Kingdom	6,000		
Austria	5,700		
Roumania	9,000	America—	
Bulgaria	4,500	United States	79,800
Turkey	5,000	Argentine Republic	16,000
Belgium	1,500	Canada	9,750
Servia	4,500	Mexico	1,750
Portugal	750	Chili	1,500
Sweden and Norway	500	Uruguay	1,000
Holland	750		
Switzerland	500	Total	109,800
Denmark	500		
Greece	750		
Total	216,150	Australasia—	10,400
Asia—			
India	36,750	Grand Total	389,350
Asia Minor	4,250		
Syria	3,000		
Persia	3,000		
Total	47,000		

From the above figures it will be seen that Australasia is becoming an important factor in the world's wheat production, occupying the tenth place on the list of producers, and ranking a little higher than Canada. It is interesting, therefore, at this stage to note the requirements of the chief importing countries during 1903.

The following were the world's net imports of breadstuffs according to the latest reliable estimates :—

	Quarters 000's omitted.
United Kingdom	26,985
Germany	8,150
Belgium	5,975
Holland	2,060
Italy	5,200
Sweden	1,075
France	2,600
Other European countries	4,110
	56,155
Non-European countries	7,600
Total	63,755

The average yields per acre for each state for 1903 and during the ten years 1894–1903 are shown below :—

State.	Average Yield per acre.	
	1903.	1894–1903.
	bushels.	bushels.
New South Wales	17·5	9·9
Victoria	14·5	7·2
Queensland	17·6	15·9
South Australia	7·7	4·4
Western Australia	13·6	11·0
Tasmania	15·5	19·8
Commonwealth	13·3	7·3
New Zealand	34·3	28·6
Australasia	14·2	8·3

A yield of 8·3 bushels per acre is a very small one 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 last five years :—

Country.	Average Yield per acre.	Country.	Average Yield per acre.
	bushels.		bushels.
United Kingdom	31·99	India	10·44
Germany	27·12	Russia	9·14
France	19·72	Argentine Republic	11·30
Hungary	17·21	Canada (Ontario and Manitoba) and North-west Territories	19·70
United States	13·49		

A bare statement of averages, however, is somewhat misleading, since the relative cost of production must also be taken into consideration. Careful inquiries show that in New South Wales, taking all factors into account, such as the proportions of lands variously prepared and sown, the proportion of crops harvested by different methods, average railway and other freights, but excluding interest on capital, rent, &c., the cost of landing wheat in Sydney may be set down at 21½d. per bushel with a 10-bushel crop, and 16½d. with a 17-bushel crop. In the near future, with the increased use of improved machinery, the average cost is likely to be much reduced.

The following may be taken as representing the minimum cost of raising wheat on farms of large area where the disc plough and drill are used :—

	10-bushel crop per acre. s.d.	17-bushel crop per acre. s.d.
(A.) Expenses independent of returns, *i.e.*, seed, bluestone, ploughing, harrowing, sowing, and rolling (if necessary)	7·3	7·3
(B.) Expenses dependent upon the crop—stripping, winnowing, and bagging	4·7	6·7
(C.) Expenses dependent upon the situation of the land, cartage, say, 6 miles road and 200 to 300 miles train	4·1	6·11
Total	15·11	20·9

The rapidly increasing use of artificial manures has an important bearing on the question of wheat growing. In New South Wales, for instance, during the season 1903–4, an expenditure of 2s. to 3s. per acre on fertilizers gave in many cases an increased yield of 6 to 8 bushels per acre, and although this result may have been partly due to exceptionally favourable circumstances, there can be no doubt that improved cultivation and manuring will considerably improve the returns.

In Victoria the practice of manuring wheat lands is increasing rapidly, and farmers are quickly realising its beneficial results. Between 1898 and 1903 the number of farmers stated as using manure increased from 7,318 to 19,921, and the area manured from 225,830 acres to 1,205,443 acres.

In South Australia it is found that owing to favourable conditions of culture a yield of 7 bushels is financially a satisfactory crop ; in none of the other states would it be possible to grow wheat commercially on so low an average. In all the states the yield could be greatly increased if cultivation of a more scientific character were adopted. Progress in this direction is, however, being made yearly, but there is still ample room for expansion. Nevertheless, the tendency in former years simply to put the seed in the ground and await results has been outgrown, and better cultivation and the use of artificial fertilizers are becoming more general.

The Railway Departments of the various states afford great facilities to farmers in the direction of enabling them to bring their grain to the coast at cheap rates. In New South Wales freight averages about 3½d. per bushel. At country railway stations provision is made for the storage of 510,000 bags of grain, while the large storehouse at Darling Harbour, adjoining both rail and water, has a capacity of 300,000 bags. In addition seven large elevators have been built which remove the bags from the trucks and deposit them in the holds of the ships by means of telescopic shoots, and four gantry conveyors load wheat from the shed into the ships. The total delivery capacity of the various loading appliances is 510 tons per hour. The wharfage space alongside the shed has a length of 1,300 feet, and the depth of water at low tide is about 26 feet.

In South Australia nearly all the wheat is grown on the seaboard, and the average haulage of the grain is only about 50 miles, for which distance the freight is 3·3d. per bushel. Plots of land are leased at low rentals adjoining the railway stations for the stacking of grain, and in the dry climate which prevails in the state this is generally found to afford adequate protection without the erection of storage sheds. Elevators for handling the grain are not in use, but no difficulty is experienced in giving rapid despatch to ships. The state possesses an extensive seaboard with a large number of ports, and the rate for delivering grain to the ships may be taken as about 1,000 bags per hour.

In Victoria the railway rates per bushel for grain are :—

200 miles	4·28d.
400 „	5·41d.

The Railway Department does not provide sheds for grain at country stations, but in some districts the farmers lease land from the Department and erect sheds thereon for storage purposes. At Melbourne the shed accommodation is limited, but at Williamstown there are five railway sheds with a total storage capacity of 190,000 bags. In addition to these, four sheds capable of holding altogether 100,000 bags of grain have been erected by shippers on sites in close proximity to the wharves. Grain elevators are not in use, but an electric conveyor was employed during 1903 to discharge grain from trucks to ships, and was found to be capable of delivering 45 tons per hatch per hour.

During the coming season it is the intention of the Commissioners to establish electric conveyors and chutes at Geelong, from which port large quantities of grain are shipped annually.

The value of the wheat crop for 1903 and the value of the return per acre in each state and in New Zealand are shown below:—

State.	Value of Production.	Value per Acre.
New South Wales	£3,975,000	£2 10 11
Victoria	4,160,000	2 2 3
Queensland	391,000	2 16 8
South Australia	1,926,000	1 2 6
Western Australia	308,000	2 4 8
Tasmania	105,000	2 2 7
Commonwealth	£10,865,000	£1 19 0
New Zealand	1,151,000	4 19 11
Australasia	£12,016,000	£2 1 5

The very high value returned in New Zealand is due to the heavy yield of grain, the area under cultivation being comparatively small and specially selected.

A detailed table of the value of the yield per acre during each of the last fourteen years is shown below for the three principal wheat-growing states — 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, also for the very low values shown in 1902–3 for Victoria and New South Wales:—

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
1901	10·6	8·9	5·9	1	6	9	1	1	0	0	16	2
1902	10·6	6·9	4·6	1	16	3	1	3	7	0	17	3
1903	1·2	1·3	3·6	0	7	11	0	7	10	1	1	7
1904	17·5	14·5	7·7	2	10	11	2	2	3	1	2	6

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 six states and in New Zealand 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	5·4
Queensland	5·7
South Australia	6·3
Western Australia	7·6
Tasmania	6·7
New Zealand	6·6

For the whole of Australasia, the average consumption was 6 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 records for the six states which form the Commonwealth show that since 1879 there were only five years during which they were forced to import wheat from places outside their boundaries. These years were 1886, 1889, 1896, 1897, and 1903. 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 state for the first time in twenty-two years was compelled to import wheat, the net import, however, being only 61,160 bushels. In 1902 the crops of New South Wales, Victoria, and Queensland were almost a complete failure owing to the drought, while those in South Australia were also adversely affected, but during 1904 some 35,000,000 bushels of wheat were available for export. The following statement gives the figures for the Commonwealth since 1883 :—

Year.	Wheat Crop. (Year ended 31st March.)	Net Export of Breadstuffs. (Year ended 31st December.)	Year.	Wheat Crop. (Year ended 31st March.)	Net Export of Breadstuffs. (Year ended 31st December.)
	bushels.	bushels.		bushels.	bushels.
1883	21,492,505	4,742,290	1894	37,143,040	11,916,782
1884	35,714,456	17,130,843	1895	27,856,015	6,774,377
1885	30,559,060	11,583,644	1896	18,262,348	(—) 4,347,168
1886	20,165,988	(—) 603,532	1897	20,880,479	(—) 3,641,306
1887	28,899,220	4,265,924	1898	28,241,409	1,341,596
1888	35,930,697	10,643,673	1899	41,417,853	11,584,688
1889	19,757,509	(—) 2,107,136	1900	39,977,566	13,960,187
1890	34,039,289	8,836,170	1901	48,353,402	24,799,745
1891	27,118,259	10,646,298	1902	38,561,619	10,329,319
1892	25,675,265	4,126,538	1903	12,363,080	(—) 9,736,931
1893	32,759,693	8,829,941	1904	*74,149,634	*41,000,000

(—) denotes excess of imports. * Estimated.

In ordinary seasons Australasia ranks about sixth amongst the exporting countries; still, its contribution to the world's markets in 1903 did not form more than one-twenty-fifth of the demand, and it cannot, therefore, be said to form a factor of any great consequence in the trade.

To Australia, as an increasing wheat-producing country, it is, however, satisfactory to find that notwithstanding the rapid increase in the world's crops the consumption of wheat is advancing even more rapidly. According to Beerbohm the visible supply of wheat in the world on the 1st April compares as follows over a series of years.

1894	23,940,000 quarters.
1900	19,850,000 ,,
1902	18,770,000 ,,
1904	15,160,000 ,,

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.
1894	22 10	1899	25 8
1895	23 1	1900	26 11
1896	26 2	1901	26 8
1897	30 2	1902	28 1
1898	34 0	1903	26 9

As showing the fluctuations in price, it may be mentioned that the highest weekly average in 1903 was 30s. 3d., and the lowest 24s. 11d.

During the past five years Great Britain imported on an average 5,227,800 tons of wheat and flour, the countries of origin being as follows :—

	tons.	per cent.
United States	2,962,000	56·66
Argentine Republic	573,600	10·97
Russia and Austria	397,800	7·61
Other Foreign Countries	202,800	3·88
Total from Foreign Countries	4,136,200	79·12
India	374,400	7·16
Canada	519,800	9·94
Australasia	197,400	3·78
Total from British Possessions	1,091,600	20·88
Total	5,227,800	100·00

In consequence of the favourable harvest in 1903, it is probable that Australasia will be in a position to supply about 16 per cent. of the British imports for the year. Amongst the foreign suppliers to the British markets the greatest falling-off is shown by the United States. In 1903 that country exported to Great Britain only 2,021,075 tons of wheat and flour, this quantity being nearly 1,000,000 tons less than that consigned in 1902, while a further shrinkage is noticeable in the supplies during 1904. The declining export is, of course, in great measure, due to the rapidly increasing home consumption.

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.	1871.	1881.	1891.	1901.	1903.
	acres.	acres.	acres.	acres.	acres.
New South Wales	13,795	16,348	12,958	32,245	51,621
Victoria	175,944	146,995	190,157	329,150	433,638
Queensland	131	88	715	1,535	2,808
South Australia	3,586	3,023	12,637	34,660	57,558
Western Australia	1,474	827	1,301	9,641	14,568
Tasmania	29,631	27,535	28,360	54,089	60,663
Commonwealth	224,561	194,816	246,128	461,320	620,856
New Zealand	139,185	243,387	323,508	405,924	391,640
Australasia	363,746	438,203	569,636	867,244	1,012,496

During 1900 there was a considerable increase in cultivation of oats, owing to the demand for this cereal created by the South African war. The colony of New Zealand furnishes nearly one-half of the production. In New South Wales the cultivation has been comparatively neglected; in Victoria, however, it is next to wheat in importance; whilst in Queensland and Western Australia the climate is ill-adapted to the cultivation of the crop, and the yield is small and counts for very little in the total production of the grain. In 1903 the yield of oats in all the Commonwealth states was comparatively large.

The total yield in each state for the period covered by the preceding table was as follows :—

State.	1871.	1881.	1891.	1901	1903.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales ...	280,887	356,566	276,259	687,179	1,252,156
Victoria	3,299,889	3,612,111	4,412,730	6,724,900	13,434,952
Queensland	.....	1,121	16,669	42,208	70,713
South Australia	38,894	32,219	80,876	469,254	902,936
Western Australia...	28,330	8,270	18,539	158,638	258,503
Tasmania	593,477	783,129	873,173	1,702,659	1,621,950
Commonwealth ...	4,241,477	4,793,416	5,678,246	9,784,838	17,541,210
New Zealand	3,726,810	6,924,848	11,009,020	15,045,233	15,107,237
Australasia	7,968,287	11,718,264	16,687,266	24,830,071	32,648,447

The average yields per acre in each state in 1903, and during the ten years 1894–1903 are shown below :—

State.	Average yield per acre.	
	1903.	1894–1903.
	bushels.	bushels.
New South Wales	24·3	18·6
Victoria	31·0	19·8
Queensland	25·2	20·3
South Australia	15·7	11·2
Western Australia	17·7	16·6
Tasmania	26·7	29·4
Commonwealth	28·3	20·0
New Zealand	38·6	36·9
Australasia	32·2	27·9

In all the provinces which grow oats to any extent, with the exception of Tasmania, the yield last year was above the decennial average. New Zealand had the high average of 38·6 bushels per acre, which compares very favourably with the averages which prevailed during 1894–1903 in the following principal oat-growing countries of the world :—

Country.	Average yield per acre.	Country.	Average yield per acre.
	bushels.		bushels.
United Kingdom ...	41·3	United States	28·8
Germany	37·9	France	26·4
Canada	37·4	Austria	23·1
Hungary.....	27·2	Russia, in Europe.	15·6

The average value of the oats crop and the return per acre, in each of the Commonwealth states and New Zealand, for 1903, will be found below :—

State.	Value.	Value per acre.
	£	£ s. d.
New South Wales	125,000	2 8 6
Victoria	1,276,000	2 18 10
Queensland	8,000	2 15 5
South Australia	84,000	1 9 0
Western Australia	29,000	1 19 11
Tasmania	152,000	2 10 3
Commonwealth	£1,674,000	£2 13 11
New Zealand.....	1,398,000	3 11 5
Australasia.....	£3,072,000	£3 0 8

The net import or export of oats by each of the states is given in the following table. New Zealand was the only province which exported this cereal to any considerable extent in 1903, although Tasmania and South Australia also exported small quantities. Owing to the late war in South Africa, a large demand for oats as horse-feed was created, and for the year ended 31st March, 1903, no less than 3,988,000 bushels of oats, valued at £511,558, were exported to that country by New Zealand alone. With the termination of the war the trade has, of course, decreased, but during the following year 1,335,972 bushels, valued at £116,909, were despatched. The total export of oats from New Zealand amounted to £453,702, of which a quantity valued at over £77,000 was sent to New South Wales. Tasmania also took advantage of the shortage on the mainland, and exported oats to the value of £90,885, of which an amount of £75,266 was consigned to New South Wales.

State.	Net Imports.	Net Exports.
New South Wales.....	1,379,690 bushels.	..... bushels.
Victoria	507,067 ,,	..... ,,
Queensland.....	134,442 ,,	..... ,,
South Australia.....	..... ,,	142,953 ,,
Western Australia	648,503 ,,	..... ,,
Tasmania.....	..... ,,	776,285 ,,
Commonwealth ...	1,750,464 ,,	..... ,,
New Zealand.....	..... ,,	4,954,068 ,,
Australasia.....	..... ,,	3,203,604 ,,

In ordinary years the Commonwealth produces sufficient oats for its own consumption, and has a fair quantity available for export.

According to a carefully-compiled estimate of the average production in the principal countries growing oats throughout the world, the yield of this grain in 1903 was as follows :—

	Quarters.
Europe	277,771,000
America	119,730,000
Africa	812,000
Australasia	4,081,000
Asia	8,962,000
Total	411,356,000

Maize.

Maize is one of the most important products of New South Wales and Queensland. In the other states the climate is not suited to its growth, and the cultivation of the cereal extends to only about 23,000 acres. The following figures show that fair progress has been made since 1861 in the area devoted to this crop :—

State.	1871.	1881.	1891.	1901.	1903.
	acres.	acres.	acres.	acres.	acres.
New South Wales	119,956	117,478	174,577	167,333	226,834
Victoria	1,709	1,783	8,230	10,020	11,810
Queensland	20,329	46,480	101,598	116,983	133,099
Other States	113	36	23	530	163
Commonwealth	142,107	165,777	284,428	294,866	371,906
New Zealand	.....	3,177	5,447	12,503	11,156
Australasia	142,107	168,954	289,875	307,369	383,062

The production in the same years was as follows :—

State.	1871.	1881.	1891.	1901.	1903.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	4,015,973	4,330,956	5,721,706	3,844,993	6,836,740
Victoria	30,833	81,007	461,447	615,472	904,239
Queensland	508,000	1,313,655	3,077,915	2,569,118	1,923,623
Other States	2,000	648	483	5,611	2,487
Commonwealth	4,556,806	5,726,266	9,261,551	7,035,194	9,667,089
New Zealand	.....	127,257	238,746	571,834	530,291
Australasia	4,556,806	5,853,523	9,500,297	7,607,028	10,197,380

It will be seen from the tables given above that although there has been an increase in cultivation amounting to over 90,000 acres since 1891, the production has only increased by some 700,000 bushels.

The following table shows the average yield of each state and of Australasia for 1903, and for the ten years ended 1903 :—

State.	Average yield per acre.	
	1903.	1894-1903.
	bushels.	bushels.
New South Wales	30·1	27·2
Victoria	76·6	59·8
Queensland	14·5	20·8
Western Australia	15·3	16·4
Commonwealth	25·9	26·0
New Zealand	47·5	43·0
Australasia	26·6	26·7

The averages for Victoria and New Zealand are of little value, as the area under maize in those provinces is small and very favourably situated; while Western Australia, during the period, has never had more than 250 acres under this crop—the average yield for ten years being less than 17 bushels per acre under cultivation.

The value of the crop for 1903, and the average return per acre, will be found below :—

State.	Value of crop.	Average value per acre.
	£	£ s. d.
New South Wales	712,100	3 2 10
Victoria	89,500	8 8 6
Queensland	220,400	1 13 1
Western Australia	300	1 15 8
Commonwealth	1,022,300	2 15 0
New Zealand	51,100	4 11 7
Australasia	1,073,400	2 16 1

The net import or export of maize by each state during 1903 was as follows :—

State.	Net Imports. bushels.	Net Exports bushels.
New South Wales	1,476,704	.....
Victoria	.....	198,452
Queensland	42,918	.....
South Australia	6,380	.....
Western Australia	7,023	.....
Tasmania	2,434	.....
Commonwealth	1,337,007	.....
New Zealand	.....	17,364
Australasia	1,319,643	.....

Of the maize imported by New South Wales and Queensland, over 1,250,000 bushels, valued at £188,000, were shipped by the Argentine Republic.

It is rather curious that the only state which imports maize to any extent is New South Wales, where it is principally grown. In Australasia, this grain does not enter into consumption as an article of food as it does in other countries, and particularly in America, which produces and consumes nearly 80 per cent. of the whole maize crop of the world. The following statement shows the world's production of maize during the past two years :—

	1902. Quarters, 000's omitted	1903. Quarters, 000's omitted.
North America	308,278	262,169
Europe	57,750	70,290
Argentine	7,770	10,799
Australasia	700	1,275
Africa and elsewhere	5,315	6,016
Total	379,813	350,549

In 1901, owing to the low yields in the United States, the world's production of maize was the smallest in recent records. This shortage was responsible for a marked decrease during 1902 in the American exports of bacon and hams, the exports to Great Britain alone showing a decline of 150,000,000 lb. on the figures of the previous year. In 1903 the yield in the States was again comparatively low.

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.	1871.	1881.	1891.	1901.	1903.
	acres.	acres.	acres.	acres.	acres.
New South Wales	3,461	6,427	4,459	6,023	10,057
Victoria	16,772	48,652	45,021	32,423	47,760
Queensland	971	256	739	11,775	22,881
South Australia	17,225	11,953	11,461	15,517	28,697
Western Australia	5,083	3,679	3,738	2,719	3,609
Tasmania	4,275	4,597	2,650	6,104	8,084
Commonwealth	47,787	75,564	68,068	74,561	121,088
New Zealand	13,305	29,808	24,268	26,514	34,681
Australasia	61,092	105,372	92,336	101,075	155,769

It will be seen that in New South Wales, Queensland, and South Australia the acreage shows a marked increase since 1891. This is especially the case in Queensland, which has now nearly 23,000 acres under barley, as compared with less than 1,000 acres in 1891. The increase during the period for the Commonwealth was nearly 100 per cent.

The production for a similar period was as stated below :—

State.	1871.	1881.	1891.	1901.	1903.
	bushels.	bushels.	bushels.	bushels.	bushels.
New South Wales	55,284	135,218	93,446	106,361	174,147
Victoria	335,506	927,566	830,741	693,851	1,218,003
Queensland	11,836	3,207	21,302	277,037	510,557
South Australia	164,161	137,165	107,183	243,362	487,920
Western Australia	5,083	36,790	48,594	35,841	53,227
Tasmania	76,812	102,475	71,686	167,485	212,459
Commonwealth	648,682	1,342,421	1,172,952	1,523,937	2,656,313
New Zealand	287,646	664,093	688,683	855,993	1,160,504
Australasia	936,328	2,006,514	1,861,635	2,379,930	3,816,817

The average yield of barley per acre in each state for 1903, and for the ten years ended 1903, is given in the following table :—

State.	Average Yield per Acre.	
	1903.	1894-1903.
	bushels.	bushels.
New South Wales	17·3	15·2
Victoria	25·5	17·5
Queensland	22·3	20·3
South Australia	17·0	13·7
Western Australia	14·7	12·1
Tasmania	26·3	24·1
Commonwealth	21·9	17·1
New Zealand	33·5	31·9
Australasia	24·5	21·0

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 of the Commonwealth states, and compares favourably with the following countries, which averaged during 1898–1903—United Kingdom, 34·0 bushels per acre; Germany, 31·3; United States, 24·2; and France, 22·1 bushels per acre. Barley is not cultivated in these states to the extent it deserves, and to the total world's production of 940,108,000 bushels in 1903 Australasia contributed only a little over 3,800,000

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 provinces, with the exception of South Australia, Tasmania, and New Zealand, were dependent in 1903 upon external sources. The trade in barley and malt for the Commonwealth and New Zealand in 1903 was as follows:—

State.	Barley.		Malt.	
	Net Imports.	Net Exports.	Net Imports.	Net Exports.
	bushels.	bushels.	bushels.	bushels.
New South Wales	223,728	.....	304,733	.....
Victoria	534,110	.....	.....	180,890
Queensland	78,726	.....	86,144	.....
South Australia	.....	63,967	.....	22,626
Western Australia	11,168	.....	85,405	.....
Tasmania	.....	28,224	3,730	.....
Commonwealth	755,541	.....	276,496	.....
New Zealand	.....	152,683	1,977	.....
Australasia	602,858	.....	278,473	.....

The average value of the barley crop and the return of this cereal per acre during 1903 will be found below:—

State.	Average value of barley crop.	Average value per acre.
	£	£ s. d.
New South Wales	22,000	2 3 3
Victoria	145,000	3 0 7
Queensland	70,000	3 1 4
South Australia	56,000	1 19 4
Western Australia	8,000	2 0 11
Tasmania	25,000	3 1 9
Commonwealth	326,000	2 13 9
New Zealand	134,000	3 17 4
Australasia	460,000	2 19 0

Owing to the rapid progress of the brewing industry in Australia, increased attention is now being given to the cultivation of barley for malting purposes. Several of the larger malting companies are offering special inducements to farmers to cultivate the crop, and it is expected that the area devoted to it will show a considerable advance in the near future. In Queensland especially, increased attention is being given to the cultivation of barley for malting purposes. It will be seen that the area reaped amounted to 22,881 acres, as compared with

430 acres in 1902, and 11,775 acres in 1901. The greater part of the crop was produced in the Darling Downs district, and bulk samples of the grain consigned to the London and San Francisco markets were most favorably commented upon.

Potatoes.

The cultivation of the potato is not confined to any particular state. Victoria, New Zealand, and Tasmania have the largest areas under this crop, but New Zealand shows the greatest production. The largest area under potatoes was recorded in 1899, when no less than 176,381 acres were cultivated. Of this area New South Wales, Victoria, and New Zealand supplied 127,421 acres as against 96,409 acres in 1900. The decrease is accounted for chiefly by the circumstance that in the two states last mentioned, this crop was abandoned to a certain extent in favour of oats for which a large demand was created by the South African war. The following table shows the acreage under potatoes in each state :—

State.	1871.	1881.	1891.	1901.	1903.
	acres.	acres.	acres.	acres.	acres.
New South Wales	14,770	15,943	22,560	26,158	20,851
Victoria	39,064	39,129	57,334	40,058	48,930
Queensland	3,121	5,086	9,173	13,338	6,732
South Australia	3,156	6,136	6,892	6,248	8,616
Western Australia	494	278	532	1,829	1,823
Tasmania	8,154	9,670	16,393	25,444	29,160
Commonwealth...	68,759	76,242	112,884	113,075	116,112
New Zealand.....	11,933	22,540	27,266	31,259	31,778
Australasia	80,692	98,782	140,150	144,334	147,890

The production for each state during the same years was as follows :—

State.	1871.	1881.	1891.	1901.	1903.
	tons.	tons.	tons.	tons.	tons.
New South Wales	44,758	44,323	62,283	39,146	56,743
Victoria	125,841	134,290	109,786	125,474	167,736
Queensland	6,585	11,984	25,018	39,530	17,649
South Australia	10,989	18,154	27,824	15,059	31,415
Western Australia	1,457	556	1,596	5,665	4,542
Tasmania	22,608	33,565	63,100	114,704	171,298
Commonwealth...	212,238	242,872	289,607	339,578	449,383
New Zealand..	42,130	121,890	162,046	206,815	208,787
Australasia	254,368	364,762	451,653	546,393	658,170

The average production of potatoes per acre is next given, for 1903, and for the ten years ended 1903. New Zealand, it will be seen, shows a considerably larger return than any of the other provinces :—

State.	Average Yield per Acre.	
	1903.	1894-1903.
	tons.	tons.
New South Wales	2·7	2·3
Victoria	3·4	3·1
Queensland	2·6	2·2
South Australia	3·7	2·6
Western Australia	2·5	3·0
Tasmania	5·9	4·2
Commonwealth	3·9	3·1
New Zealand	6·6	6·2
Australasia	4·5	3·7

Tasmania and Victoria were the only states which were able to export considerable quantities of potatoes in 1903. 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 state and New Zealand in 1903 :—

State.	Net Imports.	Net Exports.
	tons.	tons.
New South Wales	62,083	.....
Victoria	.....	18,910
Queensland	25,969	.....
South Australia	.....	7,980
Western Australia	14,560	.....
Tasmania	.....	89,652
Commonwealth	.....	13,930
New Zealand	.....	3,008
Australasia	.....	16,938

The average value of the potato crop and the return per acre for the past five years will be found below :—

State.	Value of crop.	Average value per acre.
	£	£ s. d.
New South Wales	106,000	5 2 0
Victoria	299,000	5 13 3
Queensland	35,000	5 5 3
South Australia	55,000	6 6 5
Western Australia	10,000	5 5 1
Tasmania	323,000	11 1 9
Commonwealth	828,000	7 2 7
New Zealand	362,000	11 7 11
Australasia	1,190,000	8 0 11

These values are comparatively low, and are due to the fact that the markets were glutted by the heavy supplies.

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.	1871.	1881.	1891.	1901.	1903
	acres.	acres.	acres.	acres.	acres.
New South Wales	51,805	146,610	163,863	442,163	496,017
Victoria	103,206	212,150	369,498	659,239	733,353
Queensland	3,828	16,926	30,655	63,055	78,393
South Australia	97,812	333,467	304,171	369,796	370,152
Western Australia	*14,342	24,445	28,534	92,964	109,002
Tasmania	31,578	34,790	45,445	61,495	66,947
Commonwealth	302,571	768,388	942,166	1,688,712	1,853,864
New Zealand	30,717	68,423	46,652	244,169	289,858
Australasia	333,288	836,811	988,818	1,932,881	2,143,722

* In 1869.

In New Zealand, for all the years prior to 1901, the areas shown only include the extent of sown grasses cut for hay. 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 prior to 1901 only includes the quantity of grass cut :—

State.	1871.	1881.	1891.	1901.	1903.
	tons.	tons.	tons.	tons.	tons.
New South Wales	77,460	198,532	209,417	472,621	816,810
Victoria	144,637	238,793	505,246	884,369	1,233,063
Queensland	6,278	19,640	58,842	122,039	136,117
South Australia	98,266	240,827	193,317	346,467	479,723
Western Australia	14,288	24,445	28,534	91,517	121,934
Tasmania	30,891	44,957	66,996	109,383	115,513
Commonwealth	371,820	767,194	1,062,352	2,026,396	2,903,160
New Zealand	35,674	89,081	67,361	295,581	362,322
Australasia	407,494	856,275	1,129,713	2,321,977	3,265,482

The average yield of hay per acre will be found in the next table, the periods covered being the year 1903 and the ten years which closed with 1903 :—

State.	Average yield per acre.	
	1903.	1894–1903.
	tons.	tons.
New South Wales	1·6	1·0
Victoria	1·7	1·3
Queensland	1·7	1·8
South Australia	1·3	0·9
Western Australia	1·1	0·9
Tasmania	1·3	1·4
Commonwealth	1·6	1·1
New Zealand	1·3	1·3
Australasia	1·5	1·1

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 states which import to any extent.

The net import or export of hay and chaff by each state and New Zealand during the year 1903 was as follows:—

State.	Net Imports. tons.	Net Exports. tons.
New South Wales	116,242	.....
Victoria	.....	64,654
Queensland	11,969	.....
South Australia	.....	70,656
Western Australia	1,549	.....
Tasmania	.....	21,182
Commonwealth	.....	26,732
New Zealand	.....	2,299
Australasia	.....	29,031

The value of the return from hay in 1903–4 was higher than that of any crop except wheat; the value in each state and the return per acre will be found below:—

State.	Total Value of Hay Crop. £	Average Value per Acre. £ s. d.
New South Wales	2,122,000	4 5 6
Victoria	3,031,000	4 2 8
Queensland	387,000	4 18 10
South Australia	1,148,000	3 2 0
Western Australia	355,000	3 5 2
Tasmania	281,000	4 3 11
Commonwealth	7,324,000	3 19 0
New Zealand	870,000	2 4 7
Australasia	8,194,000	3 16 5

Green Forage and Sown Grasses.

The cultivation of maize, sorghum, barley, oats, and other cereals for green food in addition to lucerne and grass is confined chiefly to the districts where dairy farming is carried on. The following table shows the area under such green food in 1891, 1901, and 1903, and it will be seen that there have been large developments in most of the states especially in New South Wales.

The return from the cultivation of green forage in all the states during the season 1903 is estimated at £589,000, or nearly £2 an acre.

State.	Green Food.			Artificially Sown Grasses.		
	1891.	1901.	1903.	1891.	1901.	1903.
	acres.	acres.	acres.	acres.	acres.	acres.
New South Wales..	32,138	110,215	77,093	333,238	467,839	552,501
Victoria...	9,202	32,795	33,165	174,982	162,954	962,665
Queensland	10,727	39,793	26,576	20,921	34,679	15,639
South Australia ...	6,416	13,695	19,241	17,519	23,510	24,118
Western Australia	238	1,024	672	.....	11,132	2,952
Tasmania	1,101	4,082	3,100	208,596	314,422	343,284
Commonwealth	59,822	201,604	159,847	755,256	1,014,536	1,901,159
New Zealand	118,484	199,508	146,166	7,357,229	11,620,178	11,803,963
Australasia ...	178,306	401,112	306,013	8,112,485	12,634,714	13,705,122

In Victoria, 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 1903 being 9,824 tons, valued at £275,521. The production in Victoria was 318 tons; in Tasmania, 796 tons; and in New Zealand, 8,710 tons. The acreage on which this grass seed was produced is not included in the total given above for sown grasses, and amounted to 2,749 acres in Victoria, 5,364 acres in Tasmania, and 68,041 acres in New Zealand. The prosperity of New Zealand is largely due to its rich meadow lands, which have been created by human industry and were not the free gift of nature. Last year nearly 12,000,000 acres were under artificial grasses in the colony, or over six times the area devoted to the crop in the Commonwealth. The productiveness of these pastures is very great.

In the Victorian returns "sown grasses" show an increase of some 800,000 acres on the figures for 1901. This is accounted for by the fact that the total now includes bush land on cultivated holdings on which imported grass, clover, &c., has spread without cultivation, also burnt-off scrub land on which grass has been sown without ploughing.

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 state. 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 fact that the vineyards in these States have suffered comparatively little from the ravages of phylloxera, which have had such a disastrous effect on immense areas of the European vineyards, is an additional reason why the vine-growers of Australia 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.	1871.	1881.	1891.	1901.	1903.
	acres.	acres.	acres.	acres.	acres.
New South Wales	4,152	4,027	8,281	8,606	8,940
Victoria	5,523	4,923	24,483	28,592	28,513
Queensland	568	1,212	1,988	1,990	2,069
South Australia.....	5,455	4,202	12,314	20,860	22,617
Western Australia	692	527	1,004	3,724	3,324
Australia	16,390	14,891	48,070	63,772	65,463
New Zealand.....	.....	.....	.....	543	749
Australasia.....	.....	.....	.....	64,315	66,212

At present the area devoted to vines is much larger in Victoria and South Australia than in the other states ; in the former state 4,030 and in the latter 10,303 acres have been added to the vineyard area since 1891. This is not great progress compared with Algeria, for example, which has already 419,177 acres under vines, although systematic planting dates only from 1849, or the Argentine with 109,700 acres; nevertheless it is a hopeful sign in Australia, where patient waiting for the harvest to be gathered years hence is not a characteristic of the agriculturist. The progress of New South Wales has been very slight, the area under vines in 1903 being only 659 acres more than in 1891. The outbreak of phylloxera in the county of Cumberland, where most of the table grapes are grown, greatly retarded the industry; but recently the Government has propagated a large number of phylloxera-resistant stocks, which are being disposed of to vignerons at a nominal price, and better progress may be expected in the near future.

Vine-growing has never been carried on to any extent in Tasmania or New Zealand, although there are numerous localities in the latter colony suited for growing vines for the manufacture of both wine and raisins. The area under vines in New Zealand in 1901 was returned at 543 acres, and in 1903 at 749 acres.

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

State.	1871.	1881.	1891.	1901.	1903.
	gallons.	gallons.	gallons.	gallons.	gallons.
New South Wales.....	413,321	513,688	913,107	868,479	1,086,820
Victoria	713,589	539,191	1,554,130	1,981,475	2,551,150
Queensland.....	.....	72,121	168,526	148,835	38,558
South Australia..... ...	852,315	313,060	861,835	2,077,923	2,345,270
Western Australia	.....	99,600	166,664	119,500	200,000*
Australia	1,979,225	1,537,660	3,604,262	5,196,212	6,221,798

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

State.	1871.	1881.	1891.	1901.	1903.
	tons.	tons.	tons.	tons.	tons.
New South Wales.....	508	1,103	3,694	3,475	4,213
Victoria	1,545	740	2,791	5,110	3,862
Queensland.....	.....	255	1,169	1,814	797
South Australia.....	1,692	1,498	4,590	12,608	13,027
Western Australia	.....	.....	.....	400	450*
Australia...	3,745	3,596	12,244	23,407	22,349

* Estimated.

Among other produce of the vineyards may be mentioned 20,101 gallons of brandy in New South Wales, while Victoria and South Australia produced respectively 13,063 cwt. and 10,406 cwt. of raisins and currants. Victoria produces much more brandy than any of the other states, but it is not wholly made from grapes, and the figures cannot be ascertained.

It is impossible to tabulate the average wine-yield of all the states, 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

1903 was about 213 gallons in New South Wales, 114 gallons in Queensland, and 204 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. In 1903 the world's production was estimated at 2,647,000,000 gallons, to which Australia contributed only 6,500,000 gallons; while in 1901 the production of Australia was returned at 5,000,000 gallons.

The following table illustrates the progress made in the export of Australian wine to countries outside of the Commonwealth since 1881. It will be noticed that in 1901, the trade with foreign countries had grown to ten times the value in 1881, while the number of gallons exported had also increased very largely. The 1901 figures are exclusive of Queensland, 39 gallons, valued at £19; Western Australia, 173 gallons, valued at £116; and Tasmania, 2 gallons, valued at £1:—

State.	1881.		1891.		1901.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	gallons.	£	gallons.	£.	gallons.	£
New South Wales..	15,761	4,767	13,429	3,463	29,239	8,101
Victoria	9,610	4,041	152,570	29,220	340,353	43,327
South Australia	8,334	2,346	249,686	45,768	485,671	67,136
Australia ...	33,705	11,154	415,685	78,451	855,263	118,564

In 1903 the export of Australian wine to countries outside of the Commonwealth was 708,976 gallons, valued at £97,981.

Including the inter-state as well as the foreign trade, the exports of each state during the same years are shown below. The figures for 1901 are exclusive of Queensland, 39 gallons, valued at £19; Western Australia, 185 gallons, valued at £122; and Tasmania, 42 gallons, valued at £16.

State.	1881.		1891.		1901	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	gallons.	£	gallons.	£	gallons.	£
New South Wales..	22,377	7,233	54,143	11,644	39,651	12,256
Victoria	12,544	5,388	160,982	32,516	364,413	50,950
South Australia.....	54,001	12,637	285,107	58,282	593,357	91,548
Australia ...	88,922	25,258	500,232	102,442	997,421	154,754

In 1903 the inter-state and foreign exports had increased to 1,031,053 gallons, valued at £166,543.

It is interesting to note that of the 570,098 gallons of Australian wine imported into the United Kingdom during 1903, 569,179 gallons did not exceed 30 degrees of proof spirit, and so carried the minimum rate of duty.

The total value of the grape crop and the average return per acre in the Australian states, for the year 1903, 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	128,000	14 5 6	16 3 3
Victoria	364,000	12 15 8	14 4 1
Queensland	13,000	6 8 4	8 8 8
South Australia	322,000	14 4 11	16 9 8
Western Australia	47,000	14 2 2	16 19 4
Commonwealth	874,000	13 7 2	15 5 3
New Zealand	11,000	14 4 11	.....
Australasia	885,000	13 7 5	15 5 3

The average value per acre of productive vines cannot be shown for New Zealand, as the area is not distinguished.

The removal of the border duties has had a remarkably invigorating effect upon the South Australian inter-state wine trade. During the five years which preceded federation, South Australian inter-state exports averaged only 48,000 gallons; while last year the total reached 200,309 gallons. The progress of the trade with New South Wales is especially noticeable, the exports to that state during 1903 being over 98,000 gallons. Victorian growers have also taken advantage of the removal of the border duties, and during the last four years the inter-state trade has increased from 5,000 to 108,676 gallons.

Vignerons in the county of Cumberland in New South Wales, who depend upon table grapes for their chief returns, have suffered severely in recent years owing to the refusal of New Zealand to admit their produce, through fear of introducing phylloxera, and the loss of this market has probably depreciated the value of table grapes in Cumberland and Camden at least 30 per cent.

Sugar-cane.

The growth of the cane and the manufacture of sugar are important industries in Queensland and New South Wales; but whilst in the former state the industry if not increasing very rapidly has so far maintained its position, in the latter the area under crop has declined by nearly one-third

since 1896. The area under cane in each state at various periods since 1865 was as follows :—

Year.	Queensland.	New South Wales.
	acres.	acres.
1865.....	94	22
1872.....	9,581	4,394
1882.....	28,026	12,167
1892.....	50,948	22,262
1897.....	83,093	32,927
1903.....	111,516	20,219

The conditions of cultivation in the two states are not precisely the same. In New South Wales, taking one year with another the area under cane is usually twice as great as the area from which cane is cut, but in Queensland the proportion of productive area is, as a rule, very much larger. This will be seen from the following statement :—

Year ended 31st March.	Total Area.		Area from which Cane was cut.		Yield of Cane per acre.	
	Queensland.	New South Wales.	Queensland.	New South Wales.	Queensland.	New South Wales.
	acres.	acres.	acres.	acres.	tons.	tons.
1899	110,657	22,517	79,435	9,435	14·8	18·1
1900	108,535	22,114	72,651	10,472	11·7	19·0
1901	112,031	20,809	78,160	8,790	15·1	21·4
1902	85,338	20,301	59,102	8,899	10·8	20·9
1903	111,516	20,219	60,375	10,368	13 6	21·9

The figures regarding the areas cultivated, which are taken from the Statistical Registers, do not agree with those furnished by the Customs Department ; but this may be partly accounted for by the fact that in Queensland the areas cut for fodder, though planted for sugar, are not included in the Statistical Register with the acreage cultivated.

For the five years the average for Queensland was 13·7 tons per acre of cane cut, as against 20·2 tons in New South Wales. This does not by any means prove the superiority of the land in New South Wales for cane-growing, for if the whole area under cane be taken into account different results are arrived at. The following figures cover five years :—

Yield of cane from total area under crop—

Queensland	8·8 tons per acre.
New South Wales	9·2 ,, ,,

In New South Wales cane is cut every second year, but in the northern state a crop is obtained from the greater part of the cane area yearly, hence the difference in the yields and the apparently large unproductive area in New South Wales. A noticeable feature in last year's crops in Queensland was the large area of "stand-over" cane, the acreage cut being but little in excess of that of 1902, though the area

planted was some 26,000 acres greater. In connection with the returns for 1902, however, allowance must be made for the fact that over 15,000 acres of cane were cut for stock feed, and were not included in the area under cane for sugar.

The quantity of sugar obtained from the cane-fields has varied during the last ten years from 77,752 to 192,844 tons per annum, the average being 127,387 tons, of which 104,555 tons were produced by Queensland, and 22,832 tons by New South Wales. The yield of sugar per ton of cane varies, of course, with the density of the juice, and in an ordinary season may be set down at 9·75 per cent. Until recent years little attention was given in Queensland to the question of irrigating sugar-cane plantations, but last year 8,600 acres were irrigated, being an increase of 4,000 acres on the figures for 1901.

The greater part of the field-work on the plantations in Queensland has hitherto been performed by coloured labour, chiefly South Sea Islanders. In New South Wales the work was formerly done entirely by white labour, but latterly there has been a considerable proportion of coloured persons, chiefly Hindoos, employed on the cane-fields. In Queensland the number of coloured labourers during 1901 was about 8,850, and as the area cut was 78,160 acres, the employment of coloured labour was in the proportion of one man to every 8·8 acres. In New South Wales the coloured labourers numbered about 1,010, and the area cut being 8,790 acres, the proportion was one man to every 8·7 acres. From this statement it would appear that there was little difference between the states in regard to the employment of coloured labour compared with the area cropped. Regard must be had to the circumstance, however, that in Queensland the law restricted the employment of Kanakas to the field-work of a cane plantation; in New South Wales no similar restriction exists, and coloured labour is employed in several occupations reserved for white labour in Queensland. This, of course, refers to the conditions obtaining anterior to recent federal legislation.

In 1901 the Federal Parliament passed an Act which greatly affects the sugar industry, especially in Queensland. Under the provisions of this measure, which is entitled the Pacific Island Labourers Act, a limited number of Pacific Islanders were allowed to enter Australia up to the 31st day of March, 1904, but on and after that date their coming is prohibited. All agreements for their employment terminate on the 31st December, 1906, and after that date any Pacific Islander found in Australia will be deported.

On the 1st September, 1904, there were 8,201 islanders in Queensland, a decrease of 253 on the figures for December, 1903. The arrivals during 1903 numbered 1,037, viz., 998 males and 39 females; while from the 1st January, 1904, up to the 31st March of that year there were 78 arrivals, of whom 76 were males and 2 females. Between 1st January, 1903, and 1st September, 1904, 1,433 islanders returned to their homes, of whom 1,367 were males and 66 females.

The following table shows the number of islanders who arrived in and departed from, Queensland during the past eleven years :—

Year.	Arrivals.	Departures.
1893	1,211	1,282
1894	1,859	803
1895	1,305	743
1896	782	608
1897	934	884
1898	1,178	693
1899	1,522	923
1900	1,743	940
1901	1,726	874
1902	1,139	1,775
1903	1,037	1,065
Total	14,436	10,590

Of the 1,037 islanders who arrived in Queensland during 1903, 312 had served a previous term in the state. The island groups at which these labourers were recruited were as follows :—

New Hebrides	345
Banks	21
Torres	8
Solomon	663
	1,037

The numbers assigned to the various districts were :—Ayr, 230 ; Bundaberg, 149 ; Cairns, 161 ; Childers, 38 ; Geraldton, 229 ; Ingham, 104 ; Maryborough, 19 ; Mackay, 69 ; and Port Douglas, 15. Two died on board ship before allotment, while 21 were rejected as physically unfit.

On the 31st December, 1903, there were 4,449 Pacific Islanders possessing deposits in the Savings Bank, and the amount standing to their credit was £34,375.

The following figures will be of interest, as illustrating the relative positions of the sugar industry in New South Wales and Queensland :—

	New South Wales.	Queensland.
Cane crushed at mills	227,511 tons	823,375 tons
Raw sugar made at mills	22,297 ,,	91,828 ,,
Area cut—white grown cane	8,981 acres	17,080 acres
,, black ,,	1,387 ,,	43,295 ,,
Quantity of cane white grown	200,765 tons	222,537 tons
,, ,, black ,,	26,746 ,,	601,338 ,,
Bounty paid	£40,153	£50,617

The above figures refer only to the areas actually cut in Queensland last season; in 1904 an area of not less than 56,289 acres was registered by the owners as destined to be placed under cane for cultivation

entirely by white labour, and hence eligible for the bounty on the produce. It will be some time, however, before this area is all available for cutting; meanwhile the bounty estimated to be paid on the 1904 crop is set down in the Treasurer's Financial Statement at £62,800 in Queensland and £37,200 in New South Wales. The principal districts in which white labour is employed in Queensland are Maryborough, Bundaberg, and Mackay, where 39,155 acres were registered as being worked under these conditions in 1903.

The duty on imported cane sugar is £6 per ton, while the excise duty is fixed at £3 per ton, but a bounty of from 4s. to 5s. per ton of cane, calculated according to its sugar contents (equal to £2 per ton of sugar), is allowed on Australian sugar grown by white labour, the bounty being paid to the grower. The employment of white against black labour is thus protected to the extent of £2 per ton of sugar, equal to about 4s. 5d. per ton of cane.

In New South Wales in 1902, 93 per cent. of the sugar produced was white grown and 7 per cent. black, while in Queensland the figures were reversed, 84 per cent. being black and 16 per cent. white grown. In 1903 New South Wales shows 88 per cent. white grown and 12 black, as compared with 73 per cent. black and 27 per cent. white grown in Queensland.

The cost of growing cane may be set down at from 2s. 11d. to 3s. 5d. per ton of cane, according as black or white labour is employed, the lower figures representing the cost of black labour.

In New South Wales the cost of harvesting the cane is somewhat as follows, the average being for areas on which white labour is employed:—

	s.	d.
Cutting	3	3
Carting to riverside	1	0
Transfer to Mills	0	9
Sundry Expenses	0	3
	5	3
Average price paid for standing cane	10	5
Total, per ton	15	8

It will be seen, therefore, that in the case of New South Wales cane the return to the grower would, including the bonus, amount to about 14s. 5d. per ton.

In Queensland the plantations are more favourably situated in regard to the mills, and the cost delivered to the mill is about 12s. 2d. per ton, or 3s. 6d. per ton less than in New South Wales, and at the rate of 9 tons of cane per ton of sugar the comparison is 31s. 6d. per ton in favour of Queensland. From Dr. Maxwell's report to the Federal Premier it would appear that the wages of coloured labourers, after making all necessary allowances, average about 2s. 4¼d. per day; the weekly wage of white labourers is from 27s. 6d. to 32s. 6d., with rations.

A fairly correct estimate of the consumption of sugar in the states of the Commonwealth may be gathered from the statement below, which shows the average quantities on which import duty and excise were paid during the year 1903 after allowing for inter-state adjustments:—

State.	Apparent consumption.	Consumption per head of population.
	tons.	lb.
New South Wales..	66,806	105·2
Victoria	54,738	101·4
Queensland	23,259	100·5
South Australia	16,062	97·8
Western Australia	10,443	106·2
Tasmania	8,170	103·1
Commonwealth	179,478	102·7

The apparent consumption for the Commonwealth was therefore 179,478 tons, or 102·7 lb. per head of the population. Of the total quantity of sugar consumed during the year specified, 45·8 per cent. consisted of foreign-grown sugar, and 54·2 per cent. was the produce of locally-grown cane. The experience of a number of years shows the average consumption of sugar in the Commonwealth to be 106·4 lb. per head, and the consumption has therefore declined.

The Federal Treasurer estimates the requirements of the Commonwealth for 1904–5 at 187,000 tons, or slightly over 104 lb. per head of the population.

In New Zealand the net import of sugar in 1903 was 42,389 tons, or 118·2 lb. per head of population.

In 1898, Queensland produced 163,734 tons of sugar, which is the highest output recorded for that state; 1,542,090 tons of cane were crushed, yielding sugar at the rate of 1·99 tons per acre. In 1903, 823,875 tons were crushed, but the juice attained a high degree of density, and 91,828 tons of sugar were produced, only 8·97 tons of cane being required to make a ton of sugar. Of the 823,875 tons of cane produced in Queensland in 1903—

5 per cent. was grown in the (1) Brisbane district.
19 ,, ,, (2) Maryborough, Bundaberg, and Rockhampton districts.
32 ,, ,, (3) Mackay, Bowen, and Townsville districts.
44 ,, ,, (4) Dungeness, Geraldton, Cairns, and Port Douglas districts.

The amount and rate of the bonus paid for white-grown cane in the above districts was as follows:—

	Rate per ton.	1902.	1903.
No. 1 district	5s.	£4,274	£9,578
No. 2 ,, ...	4s.	16,345	24,811
No. 3 ,, ...	4s. 4d.	2,974	8,728
No. 4 ,, ...	4s.	917	7,500
		£24,510	£50,617

The Commonwealth consumes annually about 181,000 tons of sugar; the crop of 1903 was 113,614 tons, but in an average year the production may be put down at about 25,000 to 30,000 tons higher. This leaves about 40,000 tons to be imported, or for a further cultivation of, say, 30,000 acres of productive cane. It must not be forgotten, however, that in exceptionally prolific years, such as 1898, when the production of Queensland and New South Wales amounted to 192,844 tons, the out-put exceeded the consumption. With a succession of good seasons, therefore, it will be seen that, even with a slight extension of cultivation, consideration would have to be given to the question of establishing an export trade.

The country of origin of 91,529 tons of the sugar which was imported into Australia from abroad during 1903 was as shown below. The quantity shown as imported from Europe was probably beet sugar:—

Country of Origin.	Quantity Imported.
Mauritius	4,792 tons
Fiji	5,953 ,,
Java	67,545 ,,
Hong Kong	7,552 ,,
Europe	48 ,,
China	4,822 ,,
United States	815 ,,
India, Natal, New Zealand, Straits Settlements	2 ,,
Total	91,529 ,,

The re-export of foreign sugar from Australia amounted to 779 tons, valued at £11,163; while 1,586 tons of Australian sugar, valued at £22,079, were exported outside the Commonwealth, £18,479 worth of which went to New Zealand.

The total value of the cane crop in the sugar-growing states of Australia for the year 1903 was:—

State.	Value of Cane grown.
New South Wales	£196,000
Queensland	591,000
Total	£787,000

These amounts are inclusive of rebate on white-grown sugar amounting to £40,153 in the case of New South Wales, and £50,617 in the case of Queensland. The value of the sugar manufactured during the year was about £1,800,000 sterling.

Large sums of money have been expended on machinery, buildings, and land in connection with the manufacture of raw sugar. In Queensland the total value of the mills amounted in 1903 to £2,136,682. Out of 60 mills in the state during last year, 42 were in active operation. In New South Wales, 6 mills were in operation during 1903, the value of the plant, buildings, and land being returned as £507,452.

The following statement shows the variation in the Sydney wholesale price of two of the leading brands of sugar at various intervals since the 1st January, 1898 :—

Date.	IA, per ton, duty paid.			No. 2 or IC, per ton, duty paid.		
	£	s.	d.	£	s.	d.
*1st January, 1898	20	5	0	19	0	0
†1st July, 1898	19	5	0	18	0	0
†27th September, 1898	18	5	0	17	5	0
†2nd November, 1898	18	5	0	16	15	0
†1st August, 1899	18	5	0	17	0	0
†6th September, 1899	18	10	0	17	5	0
†16th November, 1899	18	10	0	17	10	0
†1st January, 1900	18	10	0	17	10	0
†25th January, 1900	18	15	0	18	0	0
†22nd March, 1900	19	0	0	18	10	0
†24th July, 1900	19	10	0	19	0	0
‡9th October, 1901	21	10	0	21	0	0
8th November, 1901	21	0	0	20	10	0
1st July, 1902	20	0	0	19	15	0
8th October, 1902	19	10	0	19	5	0
17th November, 1902	20	0	0	19	15	0
9th December, 1902	20	10	0	20	5	0
7th February, 1903	20	15	0	20	10	0
22nd October, 1903	20	5	0	20	0	0
30th June, 1904	19	17	6	19	12	6
12th September, 1904	20	7	6	20	2	6
29th September, 1904	21	0	0	20	15	0
11th November, 1904	21	10	0	21	5	0

* Duty £4 per ton. † Duty £3 per ton. ‡ Imposition of Federal Tariff.

SUGAR-BEET.

The question of cultivating beet-root for the production of sugar has attracted attention in these states, principally in Victoria, where experiments were made in this direction over thirty years ago. The results obtained were not considered satisfactory enough to induce growers to cultivate this particular crop, and it was not until the year 1896 that a systematic attempt was made to establish the industry.

On the 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 had to satisfy the Treasurer of the state as to certain conditions, and if he were of opinion that these conditions were likely to be fulfilled, and it was shown that the company had a paid-up capital of not less than £20,000, he was authorised to advance a sum not exceeding twice the amount raised by the shareholders.

As a result of these concessions a company was formed in Victoria, and erected a factory at Maffra, with a capacity of 420 tons per day. The first campaign in 1898 created disappointment, though the factory had at its disposal 9,109 tons of roots, grown on 1,287 acres. In the second year, the supply of beets had fallen to 6,271 tons from over 1,500 acres under crop. The industry had the misfortune to start with two very bad seasons, the average yield of beet being only 7·08 and 4·15 tons per acre. The low yield in these years was, however, due not only to unfavourable seasons but to want of experience on the part of the growers. The cultivation was further persevered with until May, 1900, when the factory was closed down. 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, these figures comparing favourably with the United States yields, which vary from 12·9 in the case of the Oxnard Company, Grand Island, Nebraska, to 15 per cent. at the works of the Western Company, Watsonville, California, where over 30,000,000 lb. of sugar are produced annually.

The Government expenditure on plant and machinery at Maffra amounted to £60,000, and altogether upwards of £100,000 of public money was laid out in connection with the venture. Although the industry so far has been a failure, it is well known that there are large areas of Victorian soil suitable for the cultivation of beet, but before the factory can be re-started vigorous efforts will have to be put forward in the direction of securing a good and plentiful crop each year.

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.

It must not, however, be forgotten that the abolition of the border duties and the stoppage of any system of state bounties in aid of such an enterprise will compel the beet sugar to compete on level terms with the cane sugars of Queensland and New South Wales.

Tobacco.

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

Year.	New South Wales.		Victoria.		Queensland.		Australia.	
	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	668	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
1900	199	1,905	109	311	665	4,032	973	6,248
1901	182	1,071	103	345	768	5,848	1,053	8,164
1902	317	2,604	171	781	722	1,818	1,210	5,203
1903	407	5,320	129	848	772	617	1,308	6,785

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 consistently declined until 1901, when the acreage showed a slight increase over that of the previous season. 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 state 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 states, 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 state until, in 1900, the total production was only 6,248 cwt., the lowest since 1861. The production in 1903 was very small, being only about 7,000 cwt. In 1898 the crop in Victoria was almost a complete failure.

The average production per acre of tobacco in 1903, and during the ten years ended 1903, were as shown below :—

State.	Average Production per Acre.	
	1903.	1894–1903.
	cwt.	cwt.
New South Wales	13·1	9·8
Victoria	6·6	6·3
Queensland	0·8	6·7
Australia	5·2	7·9

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. At Texas and Inglewood, to which districts is practically confined the production of tobacco in Queensland, leaf of fine quality has been raised, which realises a high price in the Sydney markets. In 1903, however, owing to repeated attacks of blue mould, only 31 tons were produced. The price obtained for the leaf averaged about 6½d. per lb. From the 750 acres of land under tobacco harvested between March and May, 1904, it is estimated that 370 tons of leaf have been obtained, and it is anticipated that the area under crop will be slightly increased during the current season.

The combination of a number of manufacturing companies in Australia has had the effect of greatly decreasing the quantity of tobacco manufactured in Queensland, the trade having been largely transferred to the southern States. The effect of this may be seen in the amount of excise paid—which decreased from £32,480 in 1901 to £16,834 in 1903—the quantity of tobacco manufactured in different forms declining in value during the same period from £85,681 to £28,151. New Zealand, also, has commenced the cultivation of tobacco, but so far 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 state, and cured and shipped under the supervision of the tobacco expert. The bonus was only payable to the actual grower of the leaf, and 3 tons were assigned as the maximum quantity for which payment was to be made to any one grower or association. The bonuses have now lapsed, and seeing that only 129 acres are at present under crop, it does not appear as if the Government offer of assistance has had a very stimulating effect on the industry.

The annual consumption of tobacco in the Commonwealth is about 11,000,000 lb., and in New Zealand 2,300,000 lb., or a total of 13,300,000 lb. The proportion of waste in the manufacture of tobacco is about one-third, so that the quantity of leaf represented above may be set down as 17,700,000 lb. Applying the decennial average of 7·9 cwt. per acre, it would appear that the produce of 20,000 acres is required annually to supply the demand for tobacco in Australasia. The total value of the tobacco crop for 1903 in Australia was only £12,701, returning an average value of £9 14s. 2d. per acre.

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 1903 the proportion of the total cultivation allotted to fruit was 1·5 per cent., as compared with 1·2 per cent. in 1881. The area per 1,000 persons, in 1903, was 36·1 acres; in 1891, 36 acres; and in 1881, 29·4 acres. In the earlier years, however, the areas under market gardens were included, hence the increase in the acreage under Orchards is considerably greater than appears. 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 industry likely to be seriously interfered with, Acts have been passed in all the states 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.

Fruit-drying is a growing industry, and promises before long to attain considerable dimensions. At Mildura, on the left bank of the Murray, in Victoria, 8,386 acres are under intense culture, the crops raised including currants, sultanas, peaches, and citrus fruits. About 2,509 acres are under gordos, 2,141 acres under sultanas, and 299 acres under currants, as compared with 1,931, 870, and 148 respectively four years ago. On the other hand, a falling off is noticeable in the area under fruit-trees, especially in the case of apricots and peaches. The total area under fruit is now 1,961 acres, as compared with 3,225 acres in 1900. The rainfall is only about 9 inches per annum, but a plentiful supply of water is obtained by pumping from the Murray, and the channels command an irrigable area of about 15,317 acres. Last year the returns from the sale of fruits amounted to about £100,000. Included in the output were 1,200 gallons of olive oil, 1,688 tons of raisins, 745 tons of sultanas, and 90,000 cases of citrus fruits.

At Renmark, in South Australia, somewhat similar work is being carried on. Some 3,600 acres are under irrigation, and maintain a population of nearly 1,000 persons. The value of the fruits and olive oil sold amounted to £15,000 in 1903.

The area under orchards and gardens in 1881 and 1891, and under orchards only in 1903, was as follows:—

State.	1881.		1891.		1903.	
	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	48,832	1·9
Victoria	20,630	1·4	37,435	1·8	50,357	1·5
Queensland	3,262	2·8	9,758	4·0	12,873	2·3
South Australia	9,864	0·4	14,422	0·7	18,725	0·8
Western Australia	.....	...	.....	...	7,938	2·7
Tasmania	6,717	4·5	10,696	6·4	14,134	5·5
Commonwealth	65,038	1·5	112,427	2·1	152,859	1·6
New Zealand	16,360	1·5	29,235	2·0	26,792	1·6
Australasia	81,398	1·5	141,662	2·1	179,651	1·6

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 £11,000,000 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. During the year 1903, Tasmania exported £111,229

worth of apples to Great Britain, while Victoria sent £15,640 worth; but, as that country imports annually some £2,000,000 worth of such fruit, there is ample scope for increasing the exports from Australia.

The following table shows the import and export trade of each state in green fruit and pulp for 1903, from which it will be seen that in Tasmania, Queensland, and South Australia the exports of domestic produce are now well above the imports, while in Victoria also they were slightly in excess of the imports during 1903 :—

State.	Imports.	Exports of Domestic Produce.
	£	£
New South Wales	306,903	142,381
Victoria	99,029	109,367
Queensland	81,388	119,331
South Australia	16,146	64,467
Western Australia	40,699	15
Tasmania	27,704	270,718
Commonwealth	571,869	706,279
New Zealand	116,123	7,058
Australasia	687,992	713,337

The average value of the produce of orchards, and the average return per acre, during 1903 were as given below :—

State.	Average Value of Crop.	Average Value per Acre.
	£	£ s. d.
New South Wales	336,000	8 1 9
Victoria	272,000	6 3 3
Queensland	127,000	9 19 7
South Australia	132,000	7 1 6
Western Australia	68,000	8 12 2
Tasmania	198,000	14 0 0
Commonwealth	1,133,000	7 8 2
New Zealand	190,000	7 1 6
Australasia	1,323,000	7 7 2

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 which tends to increase or decrease, as the case may be, the general average of a state. It will be seen that New South Wales shows the largest return from this class of cultivation, the total value of the produce being £336,000, equal to an average of £8 1s. 9d. per productive acre. Considerable difficulty arose in arriving at the correct returns for the Victorian orchards. Accepting the growers' returns of the fruit gathered, and the average prices realised, the

total return amounts to £271,649, or an average of £6 3s. 3d. per acre. There is an opinion in official circles that these returns are considerably under the actual results, but conclusive evidence has not been adduced in support of this view. Assuming that the supposed understatement extends to 20 per cent., the value of the Victorian orchard crop would be £326,000, or £7 7s. 11d. per acre.

The bonuses offered by the Government of Victoria caused increased attention to be devoted to the fruit industry. Under the planting bonus of £3 an acre offered for trees planted after the 8th May, 1890, over 8,000 acres were cropped during the period of eleven years up till 1901. A sum of £25,000 was set apart for payment of these allowances, but the amount has now been expended and the payment of further bonuses is dependent upon the will of the Federal Parliament. The export trade also benefited by the system of bonuses. Prior to 1896 the amount was 2s. per case, but from that date, up to 1901, when the bonuses ceased, it was at the rate of 1s. per case.

In New South Wales the average production is small, though slightly in excess of Victoria. This latter feature is to be accounted for by the greater area under citrus fruits, which are on the whole more remunerative than deciduous fruits, the produce of which in a great number of instances, owing to lack of facilities for disposing of the crop, does not reach the markets, and in some cases is not even gathered.

In Tasmania, English fruits, such as apples and pears, are principally grown, and the excellent facilities for exporting these fruits to England makes the industry a very paying one. The average return per acre amounted to £14, while the total export of domestic fruit was as high as £270,718, or more than the domestic exports of New South Wales and Victorian fruit combined.

In Queensland the fruit industry is making good progress. The area under bananas increased by 1,311 acres during 1903, when 6,577 acres were under this crop. The Mourilyan district furnishes 54 per cent. of the total area planted with bananas. The area under pineapples is also increasing, 1,493 acres being under crop in 1903 as compared with 1,101 acres in 1902. Experiments have been made with a view of discovering the best means of keeping pineapples for export, and arrangements are in progress for canning the fruit.

In South Australia, Western Australia, and New Zealand there are extensive areas of land in every way adapted for fruit culture, and the industry in all the states shows fair progress. The fruit crop of New Zealand, however, has to be supplemented by considerable imports, the bulk of which comes from Fiji and the Commonwealth.

Market Gardens.

In all the states considerable areas are devoted to market gardens, but except as regards New South Wales complete returns of acreage and production are not readily available. The following table, however,

gives a fair approximation of the value of the industry in the different states :—

	Area under crop.	Value of Production.
	acres.	£
New South Wales	8,754	213,000
Victoria	8,455	211,000
Queensland	2,563	47,000
South Australia	9,964	218,000
Western Australia	3,315	91,000
Tasmania	1,685	39,000
Commonwealth	34,736	819,000
New Zealand	3,869	87,000
Australasia	38,605	906,000

It may be noted here that of the area under cultivation for vegetables for local consumption, a considerable proportion in all the States is in the hands of the Chinese, who succeed in obtaining large returns from their gardens. In the Sydney metropolitan area about two-thirds of the market gardens are worked by the Chinese, the average return per acre being £43, as compared with £25 per acre for European gardens.

Minor Crops.

Besides the crops already specifically noticed, there are small areas on which are grown a variety of products, chiefly rye, onions, beans, peas, turnips, mangold wurzel, pumpkins, and hops; but they are not sufficiently important to warrant special mention, except turnips in New Zealand, where no less an area than 408,659 acres were planted with this crop last year. The area under minor crops in each province in 1903 was as follows :—

State.	Acres.
New South Wales	15,204
Victoria	21,611
Queensland	28,211
South Australia	10,080
Western Australia	1,392
Tasmania	21,060
Commonwealth	97,558
New Zealand	508,152
Australasia	605,710

Cotton.—The recent agitation amongst British manufacturers in favour of increased supplies of cotton grown within the Empire led to a visit to these shores of a representative of the British Cotton-growing Association of Manchester, who reported very favourably regarding the climatic conditions and suitableness of large areas in New South Wales and Queensland for the cultivation of this crop. Extensive experiments have fully demonstrated that cotton of the finest quality can be produced in these States. In New South Wales the crop has not, so

far, been grown commercially; but in Queensland, under the stimulus of a Government bonus, 717 acres were planted in 1892, from which a production of 212,370 lb. of ginned cotton was obtained. Since that year, however, the area under crop has dwindled to comparative insignificance.

Coffee.—The cultivation of coffee promises to become of some importance in the near future, especially in Queensland. In 1903, 394 acres were under cultivation, of which 318 acres were bearing, the yield being 83,632 lb. The coffee-tree thrives well throughout almost the whole of the Queensland coastal districts; but the best average yield, 615 lb. per acre, was obtained at Herberton. The requirements of Australia approximate 2,300,000 lb. annually, so that there is ample scope for expansion in the local industry.

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 Australasia 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. Improvements are, however, already noticeable in this respect, and the efforts made by the Governments of the various States for the promotion of scientific farming are beginning to bear good fruit. In most of the provinces, agricultural colleges and model farms have been established, and travelling lecturers are sent to agricultural centres. In New South Wales the Hawkesbury Agricultural College provides accommodation for 120 resident students. The farm attached to the institution comprises 3,430 acres, of which 597 acres were under crop in 1903. Instruction in dairying is made a speciality, and the butter and cheese factory is one of the most completely equipped in the state. Experimental farms are also established in various districts of the state, and the instruction is adapted to the climatic conditions. These farms are situated at Wagga, Wollongbar, Bathurst, Berry, Grafton, Coolabah, Cowra, Glen Innes, Pera Bore, and Moree. At the four first mentioned, accommodation is provided for students, who receive instruction in the practical farming work suited to the respective districts. The fees are small, amounting, as a rule, to about £25 per annum, which sum covers tuition and board, while at the Hawkesbury College and the farms several bursaries are awarded to specially deserving students.

In Victoria, the Dookie Agricultural College has accommodation for 60 resident students. It is situated in a healthy and picturesque part of the north-east district of the state, on the outskirts of the rich Goulburn Valley district. Attached to the college is a farm of

4,846 acres, which is equipped with modern dairy buildings, poultry runs, wine cellars, shearing shed, carpenters' shop, &c., and the education embraces the leading branches of agricultural, viticultural, and pastoral pursuits. Experimental farms are carried on at Longerenong and Framlingham, and at Rutherglen there is an extensive vineyard for the propagation of phylloxera-resistant stocks. At the horticultural gardens, situated at Burnley, near Melbourne, male and female students receive a thoroughly practical training in general horticultural work.

In 1897 the Queensland Government established an agricultural college and experimental farm at Gatton, about 58 miles west of Brisbane. Accommodation is provided for 60 residential students, and of the 1,692 acres of land attached to the college, 343 acres are at present under crop. State experimental farms are also in operation at Westbrook, Hermitage (near Warwick), Biggenden, and Gindie, while there is a State nursery at Kamerunga, near Cairns, and a Government tobacco farm at Texas. Extensive experiments are also carried on in connection with the sugar-growing industry, and at the central Government station at Mackay special modes of cultivation are tested, and experiments carried on in manuring, irrigation, &c. In order that the actual work of the central station may be brought before the cane-growers, 14 sub-stations conducted by farmers' associations have been established, where the most successful experiments conducted at the central station are repeated upon a small scale. In this way farmers become co-operators, and are brought into actual touch with the scientific work carried on by the Government experts.

New Zealand possesses an agricultural college and an experimental farm of 800 acres, at Lincoln, in Canterbury. During 1903, 37 students were on the roll, and this number is considered quite sufficient, in view of the size of the farm, to permit of each student acquiring practical experience in the various branches of work carried on.

South Australia has an agricultural college and experimental farm at Roseworthy; and a central agricultural bureau in Adelaide, with about one hundred 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.

Western Australia possesses four experimental farms, situated at Narrogin, on the Great Southern line; Chapman, on the Geraldton-Northampton line; Hamel, on the S.-W. line; and Nangeenan, on the Eastern line. At the first two farms, students are admitted at nominal fees, the instruction being confined to practical work on the farm, with

the exception of occasional lectures by the scientific staff of the Agricultural Department. There are also sixty-five Agricultural Halls, erected by settlers, assisted by the Government, where lectures are delivered by officers of the Department, and, in addition, seventy-five Agricultural Societies in receipt of Government subsidy, through whose agency agricultural literature is distributed.

In Victoria, South Australia, and New Zealand, the Governments have established export depôts, where consignments of meat, butter, and other produce are inspected by Government experts, and graded and branded according to their quality. By this means little but produce of prime quality is exported, and the Colonies are gaining a high name in Great Britain for the excellence of the goods despatched.

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 states of New South Wales, Victoria, South Australia, Western Australia, Queensland, and New Zealand; while in 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 was to exceed £200, to be repaid in ten years at 4 per cent. per annum. An Amending Act (No. 1 of 1902) was passed, giving to the Board power to advance up to £500, and providing that the advances with interest thereon should be repaid within thirty-one years. Up to the 30th June, 1904, 9,572 applications had been received for advances, the amount applied for being £1,420,001. Of these applications, 4,415

have been refused or withdrawn. The number of applications approved is 5,194, representing advances to the amount of £502,828. Repayments of principal amount to £110,083, in addition to which £31,620 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, 1904, advances to the amount of £1,749,409 had been made. The total number of loans in existence on that date was 3,074, representing the sum of £1,340,551, averaging £436 each. The actual advances made during the financial year 1903–4 amounted to £159,925, of which £145,062 was advanced to pay liabilities, £4,187 to pay Crown rents, and £10,676 to improve resources of land, and to carry on. To enable them to make the necessary advances the Commissioners had sold Treasury bonds and debentures to the nominal value of £1,875,500, of which £471,475 have been redeemed, leaving a balance of £1,404,025. Up to 30th June, 1904, 8,278 applications were received, for an aggregate amount of £4,030,613. Of these, 6,409 applications, for a total sum of £3,187,489, were submitted to valuation. The Commissioners authorised 5,278 advances, amounting to £2,363,305, the amount applied for being £2,653,778, but 852 applicants declined the partial advances offered to them, amounting to £437,560, so that the net advances authorised up to 30th June, 1904, numbered 4,426,

and amounted to £1,925,745, of which £176,336 was in course of settlement. Of the applications valued, 1,131 were declined by the Commissioners, the amount of these being £533,711

In Queensland the Agricultural Bank Act, assented to on the 31st December, 1901, empowered the Government to establish a bank for the purpose of promoting the occupation, cultivation, and improvement of the agricultural lands of the state. The amount to be raised must not exceed £250,000, and may be advanced to farmers and settlers in sums not greater than £800. Applications for advances not exceeding £200 are to be given priority over those of a greater amount, and no advance must exceed 13s. in the £ of the fair estimated value of the improvements to be made. Interest at the rate of 5 per cent. per annum is to be paid on advances for a period of five years, and thereafter the advances must be repaid within twenty years by half-yearly instalments of £4 0s. 3d. for every £100 advanced. During the year 131 applications were received for advances, amounting in the aggregate to £17,173, while 26, aggregating £3,896, had been held over from 1903, awaiting the reports of the valuators. Of these, 116 were approved for £12,195, while 31 applications, for £3,850, remain to be dealt with as soon as the holdings have been inspected. The whole of the interest due to the bank on 1st January, 1904, was paid, while at the end of July interest in arrear, on which a penalty has been incurred, amounted to £142. The average of advances approved was £105. It has been pointed out by the authorities charged with the administration of the act that it would be desirable to extend the scope of the measure in the direction of allowing advances for such purposes as purchasing seed wheat, dairy stock, &c.

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, 1904, the South Australian State Bank, thus established, had advanced £889,976, and received repayments to the amount of £287,334. On that date there were arrears of interest to the amount of £1,880 outstanding. In order to enable these advances to be made, mortgage bonds had been sold to the amount of £874,230, of which £286,250 had been repurchased, leaving the amount current at £587,980. The advances made during the last financial year amounted to £95,967, and the repayments of advances made during the same period amounted to £55,072.

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 was to 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. A further Amending Act, passed in 1902, empowers the manager to advance up to two-thirds the value of improved agricultural, and one-half the value of improved horticultural, properties, the maximum grant to any one person being raised to £1,000. At least one-third of any sum borrowed under this Act must be expended in further improvements; the balance may be applied to the liquidation of liabilities, or to the purchase of stock, plant, or other farm requisites. Where portion of an advance is made to pay off liabilities, the repayment of so much of the advance begins after the expiration of one year from the date of the advance. The capital allotted to the bank is £300,000, and to the 30th June, 1904, loans to the value of £310,650 had been approved; while repayments to the value of £25,373 had been made. During the financial year 1903–4, loans were advanced to 768 applicants, the total granted being £10,945. The transactions of the bank for the same period resulted in a net profit of £2,036.

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 are chiefly 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, 1904, the Board had authorised 14,413 advances, amounting to £4,854,040. The total amount applied for in the 14,413 applications granted in full, or in part, was £5,478,020. 1,877 applicants declined the partial grants offered to them, amounting to £844,520; so that the net advances authorised at 31st March, 1904, numbered 12,536, and amounted to £4,009,520. The security for the advances authorised was valued at £8,704,640. The number of applications received up to 31st March, 1904, was 18,285, and the amount applied for, £6,630,981. The 1 per cent. sinking fund in the hands of the Public Trustee amounts to £158,520.

Water Conservation.

The necessity of providing water for stock in the dry portions of the interior of the Australian continent induced the Governments of the states 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 30th June, 1904, the Government of New South Wales had undertaken the sinking of 125 wells; of these, 119 have been completed, and 6 are in progress. Of the total number of wells, 80 are flowing, 24 are sub-artesian, yielding pumping supplies, and 15 have been failures; these wells represent 205,238 feet of boring, while with the uncompleted wells the total depth bored has been 216,059 feet. From the completed Government wells about 49,300,000 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 682,000 gallons per diem. The largest flow obtained in the state is from the Milchomi Bore, near Pilliga, which was completed in February, 1904; the depth of this well is 2,029 feet, and the estimated flow about 1,728,000 gallons per diem. The bore at Walgett, with a depth of 2,036 feet, has a daily flow of some 948,000 gallons. 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 116,600 gallons per diem is obtained. At this bore the most extensive system of irrigation by artesian water as yet undertaken in the state 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. The Pera No. 2 Bore, gives an average daily flow of 100,000 gallons. 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. Eight bores have been completed. Four of these give a pumping supply, and four are flowing, yielding an aggregate supply of 3,150,000 gallons daily. A remarkable flow has also been obtained at the Moree bore, amounting to 837,250 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. An experimental farm has been established at this site, where sub-tropical fruits and plants are grown. Among other important Government Bores that have been sunk may be mentioned that at Warren with a daily flow of 294,000 gallons, Coonamble 636,000 gallons, Old Gnomery, near Goodooga, 1,046,000 gallons, and Tuon, near Barringun, 600,000 gallons, per diem. No reliable figures can at present be given as to the total flow of private wells, but the information is being collected and will shortly be available. It is possible, however, that the discharge from the private bores exceeds that from the Government wells.

Much has been done in the way of artesian boring by private enterprise. As far as can be ascertained, 166 private bores have been undertaken in New South Wales, of which 16 were failures, 2 were abandoned, and 4 are in progress. Amongst the most important are two wells on Lissington Holding, one at Cuttabulla (Lila Springs), one at Toulby, and one at Goondabluie.

The average depth of the 103 wells completed by the Government is 1,724 feet 8 inches, with a range from 165 to 4,086 feet, while the temperature of the water varies from 80 to 139 degrees Fah. The total cost of the wells (including actual boring, casing, carriage, and incidental expenses) was £345,916, or an average of £2,906 17s. 1d. per bore, or £1 13s. 8d. per foot.

In Queensland up to the 30th June, 1903, there were 960 completed bores, of which 70 were Government, 32 Local Government, and 858 private bores. Since that date little information has been compiled by the Queensland authorities regarding artesian wells. It is known, however, that subsequent to the time mentioned one additional Government bore has been completed, the depth being 2,361 feet and the flow 954,462 gallons per diem; also, that three other Government bores are in progress.

Of the Government bores, 26 are artesian, 18 sub-artesian, and 27 were abandoned as failures. The daily flow of water from the successful bores amounts to 11,782,800 gallons. The Local Government bores included 11 artesian and 19 sub-artesian, while 2 were abandoned. From the successful bores a daily flow of 6,346,300 gallons is obtained. Of the private bores, 540 were artesian, 174 were sub-artesian, and 135 were failures or uncertain. It is estimated that the daily flow of water from private bores amounts to no less than 368,331,200 gallons. The large proportion of abandoned Government bores is due to the fact that many of them were sunk for experimental purposes in order to ascertain the prospects of obtaining artesian water. Others were put down by the old methods of boring, by which depths over 1,000 feet could not be penetrated in the swelling clays of Queensland. The total expenditure by the Government up to the 30th June, 1903, amounted to £368,629 on water conservation, of which £124,039 was expended on artesian bores. 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 state, is the Whitewood on the Bimerah run, and reaches 5,045 feet. The largest supplies are obtained from the Longlands bore, which yields 6,000,000 gallons daily; Corio-Cunnamulla East, 4,500,000; Burrambilla and Gooia, Cunnamulla West, 4,000,000; Boatman, 3,500,000; and Savannah Downs yielding 3,400,000 gallons daily. The total depth bored in search of artesian water up to 30th June, 1903, was 1,171,461 feet, the average depth per bore being 1,220 feet. At Helidon water of so low a temperature as 60 degrees Fah. was flowing; while at Elderslie No. 2 the water had a

temperature of 202 degrees. Extensive areas are served by the water from the bores for irrigation purposes; in 1903 there were 14,786 acres irrigated, as compared with 6,526 acres in 1901. In addition several stations, which did not furnish returns, also used the water for purposes of irrigation. Some of the bore waters contain soda in various forms, and these it is impossible to use, except for a limited period, and in small quantities. Of the 14,786 acres irrigated, 3,952 acres—or 27 per cent.—are served with water from artesian bores; 2,760 acres being irrigated with artesian water at Cunnamulla.

At the end of 1903 the Water Conservation Department of South Australia had completed 107 bores, of which, however, only fifty 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 state. The bore at Tintinara has proved that the marine tertiary area is water-bearing. The south-western portion of the great artesian basin lies under the north-east corner of South Australia proper, and a portion of it is under the south-eastern corner of the Northern Territory. This portion of the basin covers an area of 120,000 square miles, and towards its southern and western fringe occur the well-known mound springs, naturally indicating the existence of artesian water. Of the Government borings in this basin, there are eight flowing artesian wells under 1,000 feet in depth, ten from 1,000 to 3,000 feet, three between 3,000 and 4,000 feet, and one from 4,000 to 5,000 feet. It will therefore be seen that the South Australian Government has had considerable difficulties to overcome in prosecuting the work of opening up these sources of national wealth. The sea basin, which at one time existed within what is now South Australia, was of great depth, and many of the bores pierced through a thickness of strata varying from three-quarters of a mile to nearly a mile before striking the artesian water. The daily flow from the bores ranges from 4,000 to 1,200,000 gallons. The quality of the water varies considerably. Most of the bores furnish excellent drinking water, but towards the fringe of the basin, where there is little or no circulation, the supply is too salt for domestic use, and is only fit for cattle. The average increase in the temperature of the water has been found to be 1 degree Fah. to every 27 feet in depth. From certain of the deep borings, the water flows over the surface at a temperature of about 200 degrees Fah. Some very successful bores have also been put down on pastoral holdings. In some other parts of South Australia there are comparatively small local artesian basins from which good supplies have been obtained. Four successful bores have been put down in these districts by the Government, and the artesian areas have also been tapped by private persons. The depth of the private bores, however, is seldom over 200 feet. In parts of the state, where flowing supplies are not obtainable, the Government has for

many years carried on boring operations, and in a fair number of cases sub-artesian water has been struck.

The results from Government bores up to 31st December, 1903, are as follows :—

Flowing artesian wells	27
Sub-artesian wells (water good for stock)	23
Salt, or otherwise unsuccessful bores	57
Total	107

In addition to these, two deep borings are in progress. The total expenditure by the Government on boring has been £271,441, of which £11,190 was expended during the year 1903.

The Government of Western Australia, following the example set by those of the eastern states has sunk 30 bores in various parts of the state, and 14 bores have been sunk by private owners. Of the Government bores, 25 have been successful, and yield a daily supply of 8,469,000 gallons, and 5 were failures. All the private bores yield supplies of water with the exception of two—the daily flow being 2,414,000 gallons. The deepest flowing bore is at Carnarvon, and reached a depth of 3,011 feet; while the largest supply is obtained from the municipal bore at Guildford, and amounts to 1,120,000 gallons daily. Up to the 31st December, 1903, the Government had expended £55,835 on artesian boring, while £9,819 had been spent by private owners. Amongst the most important bores completed during 1903 was the No. 1 bore, at Eyre. This is one of a series of bores put down for the purpose of ascertaining whether a supply of artesian water would be available for the suggested Trans-continental Railway. It has resulted in a flow of 31,000 gallons of stock water per day at a depth of 2,101 feet.

The total expenditure on water supply has amounted to £3,383,795, included in which is a sum of £2,672,165 for the Coolgardie Water Supply scheme.

In Victoria the attempts to obtain water by means of artesian boring have not been successful. Up to the 30th June, 1904, 46 bores had been sunk, 16 of which were driven to bed-rock, but none yielded artesian supplies. The expenditure on these bores amounted to £68,864, and the cost of water conservation, including Government expenditure on Melbourne Water Supply, was £8,803,314.

Employment in Agricultural Pursuits.

The following table shows the number of persons engaged in agricultural pursuits in Australasia during the years 1891 and 1901. The figures relate to the direct producers who were employed on holdings at the end of March in each year, and are exclusive of persons engaged in

the manufacture of raw materials, as well as of casual hands who may have been employed at other periods of the year than that stated.

State.	1891.			1901.		
	Males.	Females.	Total.	Males.	Females.	Total.
New South Wales	67,576	7,022	74,598	75,884	1,735	77,619
Victoria	79,090	6,028	85,118	78,539	17,381	95,920
Queensland	33,891	6,089	39,980	38,260	2,081	40,341
South Australia	27,961	886	28,847	33,039	1,147	34,186
Western Australia	4,378	164	4,542	8,322	285	8,607
Tasmania	14,584	1,447	16,031	17,348	2,074	19,422
Commonwealth	227,480	21,636	249,116	251,392	24,703	276,095
New Zealand	56,671	2,387	59,058	65,723	2,089	67,812
Australasia	284,151	24,023	308,174	317,115	26,792	343,907

A classification of the returns for 1901 according as the persons employed in agricultural pursuits were engaged therein as proprietors and managers, relatives assisting, or servants, is given below for all the states except Queensland, where the information has not been published.

State.	Proprietors and Managers.			Relatives assisting.			Servants.		
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
New South Wales	32,466	1,607	34,073	10,271	111	10,382	33,147	17	33,164
Victoria	33,383	3,031	36,414	17,609	13,625	31,234	27,547	725	28,272
South Australia	13,796	691	14,487	4,108	240	4,348	15,135	216	15,351
Western Australia	3,747	131	3,878	1,426	139	1,565	3,149	15	3,164
Tasmania	7,028	371	7,399	3,373	1,205	4,578	6,947	498	7,445
New Zealand	29,340	1,091	30,431	12,301	841	13,142	24,082	157	24,239

With regard to Victoria it appears that females engaged in domestic duties, who also gave some assistance in farming, were classified as relatives assisting in agricultural pursuits, whereas, in other states, these were included in the category of dependents performing domestic duties.

In proportion to population the persons engaged in agricultural pursuits numbered 8·9 per cent. in 1891, compared with 7·6 in 1901. The decrease in the latter year is accounted for partly by the rapid extension of the dairying industry which has absorbed many of those formerly engaged in agriculture, and partly by the increased cultivation of wheat, which does not require such a large proportion of labour as other miscellaneous crops.