PRODUCTION.

Land Settlement, Water Supply, etc.

Private and Crown lands.

The return for 1904 received from the Lands Department shows the total area of the State to be 56,245,760 acres. Of this, 25,797,312 acres are private lands, 21,713,071 acres being alienated in fee simple, and 4,084,241 acres in process of alienation. The balance, 30,448,448 acres, comprises the following:—Roads in connexion with lands alienated and in process of alienation, 1,623,139 acres; agricultural college and water reserves, 447,538 acres; State forests and timber reserves, 4,663,873 acres; State education endowment, temporarily reserved, 1,592,400 acres; other reserves, 598,161 acres; unsold land in towns, &c., 1,871,721 acres; in occupation under grazing area leases, 3,528,986 acres; Mallee pastoral lands, 2,274,317 acres; all other leases, 946,181 acres.

Land Acts.

The present system of disposing of the Crown land of Victoria dates from the passing of the "Land Act 1884" and the "Mallee Pastoral Leases Act 1883," which, with subsequent amendments, were consolidated by the "Land Act 1890." This Act was in turn amended by the Land Acts 1891, 1898, 1900, and 1900 (No. 2); and by the "Settlement on Lands Act 1893," and the "Mallee Lands Act 1896." These Acts were all consolidated into the "Land Act 1901," which, again, has been amended by the Land Acts of 1903 and 1904.

Lands available for occupation.

For the purposes of administration, the State is divided into seventeen districts, in each of which there is a land office under the management of a land officer. These officers are situated at Melbourne, Ararat, Alexandra, Bairnsdale, Ballarat, Beechworth, Benalla, Bendigo, Castlemaine, Geelong, Hamilton, Horsham, Omeo, Sale, Seymour, St. Arnaud and Stawell, and the officers stationed at these centres are in a position to point out the exact localities of

available lands to intending selectors. The whole of the unalienated lands of the Crown which are now available for selection, excluding available Mallee lands, are divided into the following classes :—

LANDS AVAILABLE FOR OCCUPATION, 31ST DECEMBER, 1904.

County.	Classification.						Total.
	First.	Second.	Third.	Fourth.	Auriferous.	Pastoral.	
	acres.	acres.	acres.	acres.	acres.	acres.	acres.
Buln Buln ..	5,677*	28,718†	44,195	..	..	..	78,590
Croajingolong ..	..	..	431,000	47,500	16,740	596,200	1,091,440
Dargo	..	..	104,450	..	99,380	223,200	427,030
Tambo	..	..	194,320	..	3,800	365,750	563,870
Tanjil	..	..	20,615	..	53,500	360,000	434,115
Wonnangatta ..	..	..	91,235	..	..	944,070	1,035,305
Bogong	3,927‡	3,687	142,278	..	148,325	219,100	517,317
Benambra ..	..	..	117,330	..	91,470	421,580	630,380
Delatite	250	17,417	168,550	..	71,860	178,800	436,877
Moira	..	..	3,759	..	..	..	3,759
Anglesey	..	4,757	39,372	..	10,499	..	54,628
Bourke	..	2,995	..	..	..	..	2,995
Dalhousie ..	20	520	4,802	..	10,132	..	15,474
Evelyn	30	21,684	..	..	10,526	..	32,240
Mornington ..	..	1,951	33,543	..	..	..	35,494
Bendigo	60	513	792	..	25,005	..	26,370
Rodney	..	165	1,680	747	4,139	..	6,731
Borung	129	1,724	54,062	..	33,505	9,600	99,020
Gladstone ..	20	3,130	5,289	..	102,535	..	110,974
Lowan	..	1,913	49,611	7,160	..	19,415	78,099
Kara Kara ..	63	3,257	2,002	..	39,093	..	44,415
Talbot	1,647	361	910	..	86,889	..	89,807
Tatchera ..	..	86	..	..	..	..	86
Heytesbury ..	..	1,200	164,000	..	..	..	165,200
Polwarth	1,580	11,700	37,000	..	..	..	50,280
Grant	..	..	..§	..	22,500	..	22,500
Grenville	..	300	..	..	49,000	..	49,300
Ripon	..	..	5,871	5,550	11,070	..	22,491
Normanby ..	..	265	74,708	..	..	5,600	80,573
Dundas	425	..	13,391	11,920	..	11,150	36,886
Villiers	..	..	238	..	..	..	238
Follett	..	117	14,552	..	..	..	14,669
Total ..	13,828	106,460	1,819,555	72,877	889,968	3,354,465	6,257,153

NOTE.—In addition to these lands, there are 1,555 acres of swamp or reclaimed lands, and 19,662 acres of lands that may be sold by auction, available for occupation.

* 4,400 acres in Bulga about to be made available.
† 16,270 acres in Fumina unsurveyed. Not open at present.
‡ Land in Chiltern and Stanley objected to by Mining and Forest Departments.
§ 27,700 acres, 3rd class. Withheld from selection for the present.

In addition there are 6,623,762 acres of Mallee land. The leases of these lands expired in 1903, and since that time the areas are held principally on grazing licences renewable annually—the Government being entitled to resume possession at any time, and thus they are classed amongst those lands available for occupation. The total area of land available is, therefore, 12,902,132 acres.

Land Boards.

Lands Classification Boards, each consisting of three members, who are officers of the Lands Department, are constituted for the purpose of classifying Crown lands. If any land in either of the first four classes is too highly classed, or if any land in the second, third, or fourth classes is not classed high enough, the proper classification is determined by one of these Boards. The classification of

any land cannot, however, be altered after an application to select the same has been granted; but licensees of third-class land, whose licences were granted prior to 27th December, 1900, are entitled to have their allotments reclassified.

Land Acts 1903 and 1904.

The Land Act 1903 has, however, introduced important amendments in regard to the classification of unalienated Crown lands. It is provided that any such land may, before or after being classified, be made available for selection. Before being made available a plan of the projected subdivision shall be prepared, and a provisional valuation and classification indicated thereon, specifying the rates of licence-fee, rent or purchase money payable therefor. On the completion of a permanent survey of an allotment the value may be determined either before or after an application to select it has been granted by a Classification Board, and the licence-fee, rent, and purchase money shall be fixed to accord with the value so determined, and shall be substituted for the rates which would otherwise have been payable under the provisions of the Land Act of 1901. It is also provided that the Governor in Council may, if at any time it appears that the value of any unalienated land is greater than the value as fixed by the provisions of the Land Act of 1901, increase the rates of the licence-fees, rent or purchase-money payable in respect thereof. The Land Act 1904 deals principally with procedure.

Agricultural and grazing lands.

Crown lands technically known as first-class, of which there are now approximately 13,828 acres available for selection, are situated principally in the counties of Buln Buln, Bogong, Talbot, and Polwarth, and consist for the most part of good chocolate soil of volcanic origin, and the grey soil of the coal-bearing country. These areas are heavily timbered. The second-class land is fairly distributed throughout the State, and comprises silurian and granite ranges, and lower lands of tertiary formation. A large portion of this land has chiefly a grazing value, though parts, comprising creek flats and gullies, are suitable for cultivation; but a large proportion is specially suitable for vineyards and orchards. The approximate area of this class available is 106,460 acres. The area of third-class lands, which, like the second-class lands to be found in almost every county in the State, is very extensive, amounting approximately to 1,819,555 acres available for selection. The fourth-class (inferior grazing lands) includes areas formerly held under pastoral lease, and the area available amounts approximately to 72,877 acres, and are situated principally in Croajingalong, Dundas, Lowan, and Ripon.

Grazing area

There are several different methods of tenure of lands of the above four classes. A grazing area lease may be obtained by any person over the age of 18 years of an area not exceeding 200, 640, 1280, or 1920 acres of first, second, third, or fourth class lands respectively, for any term expiring not later than the 29th December, 1920, when the land, together with all improvements—to be allowed for at a valuation limited to 10s., 7s. 6d., 5s., and 2s. 6d. for each of the four classes respectively—reverts to the Crown. The annual rent of a grazing area is 3d., 2d., 1d., and ½d. per acre according

to the class of land. The lessee of a grazing area may select thereout as a homestead 200 acres of first-class, or 320 acres of second-class, or 640 acres of third-class, or 960 acres of fourth-class land.

Agricultural and grazing allotments.

Persons not below the age of 18 years desirous of selecting and obtaining the freehold may do so by either taking up a grazing area lease and selecting thereout, as just described, or by obtaining direct, without first obtaining a grazing area lease, an agricultural or grazing allotment on the instalment system. The purchase money is fixed at 20s., 15s., 10s., or 5s. per acre, according to the class of the land; and is payable by even annual instalments (without interest) extending, in the case of a residential selector, over a period of 20 or 40 years, at his option; but, in the case of a non-residential selector over a period of 20 years only. The land is occupied during the first six years under probationary *licence*, and during the remainder of the term under lease. During the period of the licence the land must be kept free from vermin, enclosed with a fence, and certain improvements made. After the expiration of the six years' licence, the selector, if all conditions have been complied with, can either purchase his holding by paying up the balance of the purchase money, the six annual instalments (licence-fees) already paid being credited as part payment, or may convert his licence into a lease extending over 14 or 34 years, as the case may be, at the same annual rental, which is also credited to the selector as part payment of the fee-simple. On the expiry of the lease, and after due payment of the rent, the land becomes the freehold of the selector in fee-simple.

Perpetual leases.

Instead of selecting by way of licence and lease, by which system the freehold is obtained, a settler may lease a larger area of agricultural and grazing lands under perpetual lease, on easier terms. The annual rental is 3d. in the £1 on the value of the land, which is fixed at £1, 15s., 10s., and 5s. per acre for first, second, third, and fourth-class lands respectively till 1909. The rent is subject to revision every ten years, but must not exceed 3d. in the £1 of the unimproved value of the land. Residence on or within five miles of the land for six months during the first year, and eight months during each of the four following years, is necessary; but if one-fourth of the allotment be cultivated during the first two years, and one-half before the end of the fourth year, the residence covenant will not be enforced. Improvements of a certain specified value at least must be effected within specified periods; vermin must be destroyed within two years, and the land must be kept free from vermin and noxious weeds.

Pastoral occupation.

The total area of the pastoral lands now available for occupation is 3,354,465 acres, situated in various parts, principally in the counties of Wonnangatta, Croajingalong, Benambra, Tambo, Tanjil, Dargo, Bogong, Delatite, and Lowan. A large portion is difficult of access, being in high altitudes, where cultivation is impossible and grazing impracticable except during the summer months. Leases of from 1,920 to 40,000 acres may be issued for any term expiring not later than 29th December, 1909, the rental being computed

according to the grazing capacity of the land, at the rate of 1s. per head of sheep, and 5s. per head of cattle. A lessee of pastoral lands may select and obtain the freehold of a homestead out of his leasehold up to 200, 320, 640, or 960 acres of first, second, third, or fourth-class land respectively.

Swamp or reclaimed lands.

The total area of swamp or reclaimed lands amounts to upwards of 1,555 acres. The most important of these are situated at Koo-wee-rup, Moe, and Condah, which have been reclaimed at considerable cost to the Crown. These lands are divided into allotments not exceeding 160 acres. When the value of an allotment has been determined, it may be disposed of in one of four ways, viz., under a 21 years' lease at public auction; under perpetual lease, at a rental of 4 per cent. on the value of the land; under a conditional purchase lease, payment extending over $31\frac{1}{2}$ years by 63 half-yearly instalments, including $4\frac{1}{2}$ per cent. interest on the balance of the unpaid purchase-money; or by public auction, on terms similar to those explained in the following paragraph:—

Lands for sale by auction.

Lands which may be sold by auction (not including swamp or reclaimed lands) comprise about 19,662 acres. One-eighth of the purchase money must be paid as a deposit, the balance being payable in not more than forty half-yearly instalments. Isolated portions of Crown lands not exceeding 50 acres, or any portion not exceeding 3 acres required as a site for a church or for any charitable purpose, may be sold at auction. There are stringent provisions prohibiting agreements which would prevent fair competition.

Auriferous lands.

The "auriferous lands" comprise upwards of 889,968 acres, and cannot be alienated in fee simple. They are distributed over nineteen counties in various parts of the State. Any portion of these lands which are found to be non-auriferous, or which can be alienated without injury to mining interests, may be transferred to classes under which they may be selected. This class of land is, for the most part, suitable for fruit culture and grazing. Annual licences are issued for areas not exceeding 20 acres, on payment of an annual licence-fee of 5s. for areas of 3 acres or under, 10s. for areas from 3 to 10 acres, and 1s. per acre for areas over 10 acres. The licensee has the right to use the surface of the land only; cannot assign or sublet without permission; must either reside on or fence the land within four months, and cultivate one-fifth of the area. He must post notices on the land, indicating that it is auriferous; and miners have free access to any part of the land not occupied by buildings. Grazing licences, renewable annually at the option of the licensee, are issued for a period expiring not later than the 29th December, 1905, for areas not exceeding 1,000 acres, at a rent to be fixed by appraisement. Holders of miners' rights, issued under the Mines Acts, 1890 and 1897, are entitled to occupy for the purpose of residence or business a maximum area of one acre or a lesser area fixed by local mining by-laws. The rental is £5 per annum, and a habitable dwelling must be erected on the area within four months. After being in possession for two and a half years, and

having erected buildings or other improvements, the holder may apply to purchase his allotment at a price to be determined by the Board of Land and Works.

Annual grazing licences.

Grazing licences to enter with cattle or sheep upon reserves or other Crown lands may be issued annually for any period up to seven years, subject to cancellation at any time during the period. Any fencing erected by a licensee may be removed by him.

Other leases, purchases, &c.

Leases up to 21 years at an annual rental of not less than £5, and annual licences at various rates are issued for different purposes, such as sites for residences, gardens, inns, stores, smithies, butter factories, creameries, brickmaking, &c. Any person who has been in possession of land for five years under one of these annual licences, if the land is outside the boundaries of a city, may purchase the site at a price to be determined by an appraiser, in which case any rents previously paid will be credited towards purchase money.

Temporary licences may be issued for purposes of grazing, residence, or timber cutting, on payment of fees, and on approved terms and conditions.

Position of State forests and timber and water reserves.

Any person who has made his home or that of his family for five years on forest lands, whether permanently reserved or not, and has improved such lands to the extent of at least £2 per acre, may purchase an area up to 10 acres at a price to be determined by appraisement.

Alienation of timber reserves is forbidden, but licences may be issued to cut timber on payment of the prescribed fee, and under approved terms and conditions. From time to time, as the lands forming these reserves become denuded of timber, and the same is notified in the *Government Gazette*, the lands so denuded may be added either to the pastoral, agricultural, or grazing lands of the State, and dealt with as such.

Alienation of water reserves is absolutely prohibited.

Mallee lands.

The "mallee country"—so named from the scrub found growing there—occupies about 11,000,000 acres of the extreme north-west portion of the State. The soil is light chocolate and sandy loam, and, in its virgin state, is covered with mallee scrub, interspersed with plains lightly timbered with box, she-oak, and pines. Since the introduction of the "mallee roller" and the "stump-jump" plough, the scrub can be cleared off at a moderate cost. With the extension of railway facilities and by the utilization of some of the surplus waters of the Murray for irrigating, there will be great scope for successful settlement in this country. There are now 6,623,762 acres included in the general list of unalienated lands available for occupation. Land in the mallee is classified into four classes, and the terms of purchase by licence and lease are now very similar to those in respect of agricultural and grazing allotments previously described, viz., for 1st class land, 20s. per acre; 2nd class, 15s.; 3rd class, 10s., and 4th class, 5s., payable during a term of either 20 or 40 years.

Alienation of land, 1900 to 1904.

During 1900, 494,752 acres were alienated in fee simple, including land selected in previous years; 406,145 acres in 1901; 523,574 acres in 1902; 510,080 acres in 1903; and 584,010 acres in 1904; the

purchase money being £526,650 of that in 1900; £438,363 in 1901; £555,538 in 1902; £542,011 in 1903; and £613,511 in 1904. The Crown lands absolutely or conditionally sold during the last five years were:—232,783 acres in 1900; 523,464 in 1901; 306,806 in 1902; 348,813 in 1903; and 263,180 in 1904. The Crown lands under pastoral occupation on 31st December, 1904, are thus described:

Number of Licences and Leases	24,330
Area (acres)	13,693,116
Annual Rental	£53,888

"Transfer of Land Act."

The "Torrens System," whereby persons acquiring possession of land may receive a clear title, was introduced into Victoria in 1862. The system was orginated previously in South Australia by the late Sir R. R. Torrens, and has been the means of simplifying procedure in connexion with the transferring of land; gives a title to the transferee free of any latent defect; and cheapens the cost of dealing in real estate by reason of the simplicity of the procedure. All land parted with by the Crown since 1862 is under the operation of the Transfer of Land Act, and the Crown grant issues through the Titles Office; but to bring under the Act land that was parted with prior to that year, application must be made accompanied by strict proofs of the applicant's interest in the property. During 1904 there were 550 applications to bring under the Act land amounting to 113,887 acres in extent, and to £1,086,447 in value, whilst the land brought under the Act during the year by application amounted to 114,830 acres in extent, and to £1,608,851 in value. Up to the end of 1904, there had been brought under the Act 2,210,518 acres, valued at £47,212,884. The value of the land, in regard to which applications were received last year, was higher than in any year since 1891; the number of certificates of title issued was 8,168, and the fees paid thereon were £35,303.

Assurance funds.

When application is made to bring land under the Transfer of Land Act, a contribution of ½d. in the £1 on the value of land is levied on the applicant to assure and indemnify the Government in granting a clear title against all the world, when there may have been a latent interest of some other person in the property, whom the Government recompenses out of this fund for the loss of such interest. Since 1884-5 the assurance fund has been reduced by £75,073, which amount was advanced towards the purchase of land adjoining the Titles Office, and on which the fund receives 4 per cent. per annum from the general revenue. Since its first formation, 30 claims have been made, and sums amounting to only £6,457 (including costs) have been paid to claimants.

Total amount realized by sale of lands.

From the period of the first settlement of the State to the end of 1904, the amount realized by the sale of Crown lands was £30,627,053, or at the rate of £1 8s. 3d. per acre. It must, however, be remembered that payment of a considerable portion of this amount extended over a series of years without interest, allowance for which, at the current rate would, it is evident, materially reduce the amount the State actually obtained for the land. It may be calculated that, with interest at 5 per cent., if the payment of the

£1 per acre by equal annual instalments be extended over ten years without interest, the amount of purchase money is really equivalent to only 15s. 6d. per acre, and if it be extended over twenty years, it is reduced to 12s. 6d. per acre.

Village Settlement.

Although there is at the present time very urgent need of adopting means whereby the people of the State may be settled on its lands, yet this important matter has not been altogether lost sight of in the past, as effort was made as early as 1893 to provide work for the unemployed labour of the State by means of village communities, homestead associations, and labour colonies.

Village settlement

Chiefly with a view to providing an outlet for the unemployed labour of the colony, an Act (the *Setlement on Lands Act* 1893, No. 1311) was passed on the 31st August, 1893, providing for the establishment of three descriptions of rural settlements, viz. :—Village Communities, Homestead Associations, and Labour Colonies. For the Village Communities certain lands were set apart and divided into allotments of from 1 acre to 20 acres in extent, to occupy which for periods of three years permits are granted to approved applicants. An applicant must not be under the age of eighteen, nor the owner in fee simple of 2 acres or upwards, nor the lessee of a pastoral allotment of grazing area, nor a licensee under sections 42 or 49 of the *Land Act* 1890, nor a lesee of a homestead association allotment. During the period over which the permit extends the occupant pays a rental of 3d. per acre per annum, or if he occupy Mallee land, 1d. per acre per annum, and on the expiration of that period he is granted a lease for twenty years, during the currency of which he is required to pay half-yearly, in advance, a sum equal to the fortieth part of the price set upon the allotment, which is generally £1 per acre, except in special cases when the price is considerably higher; he has also to repay, in equal yearly instalments extending over the currency of his lease, any moneys which have been advanced to him, and to pay the cost of surveying his allotment in ten half-yearly instalments extending over the first five years thereof. The lessee is bound to bring one-tenth of his land under cultivation within two years of the date of his lease, and one-fifth within four years of such date; and is, moreover, to put on the land permanent improvements to the value of £1 per acre within six years of such date. All conditions having been complied with, the lessee is entitled to receive a grant in fee of the land he occupies, at any time after six years from the date of lease.

Homestead associations and Village Communities.

The Homestead Associations were originally combinations of not less than six persons who desire to settle near each other. These Associations, however, proving unsuccessful, the part of the Act relating to them was repealed last year.

The area originally made available for Village Communities and Homestead Associations was 156,020 acres in 85 different localities in the State. A large portion of this area was, however, found to

be unsuitable for Village Settlement purposes, and has been withdrawn from the operation of the Act. After the Act had been in operation for some time, it was generally recognised that the area which a settler could acquire under Part I. of the Settlement on Lands Act, viz., 20 acres, was too small, in many cases, to make a living on, it was decided to allow settlers to acquire additional area under Conditional Purchase Leases, the value of which, together with original holding, should not exceed £200. This was provided for in the *Land Act* 1901 (Secs. 344-346), and settlers have largely availed themselves of the privilege. The area now occupied is 57,588 acres, and this is divided among 1,891 settlers, giving an average of 30 acres each. At the time of the last inspection (June, 1904), there were 1,758 settlers actually residing, of whom 1,417 were married and 341 were single. In addition to these, 133 settlers were improving their holdings, but were not residing on the land. Including wives and families, the total souls numbered 8,536. On 30th June, the stock numbered 9,196 bullocks, cows, and calves, 2,208 horses, 26,500 fowls, 2,399 pigs, which, together with other stock (goats, sheep, &c.), were valued at £71,858. The area under cultivation was 24,165 acres, and the total value of improvements effected was £254,955.

The numbers specified above do not include a considerable number of settlers who have surrendered their Village Settlement leases and obtained licences in lieu thereof, under Section 47 of the *Land Act* 1901.

The total amount of monetary aid advanced to settlers was £67,379, and up to 30th June, 1904, £15,431 were repaid. During the last four or five years very little monetary assistance was afforded, and now it has ceased altogether.

Closer Settlement Act 1898.

Private lands—Purchase for closer settlement.

A system by which the Government was enabled to purchase private lands for closer settlement from persons willing to part with them at a fair price, was introduced in 1898, by Part III. of the Land Act of that year. That part, with several subsequent amendments of minor importance, became Part IV. of the Consolidated Act of 1901, since superseded by the Closer Settlement Act of 1904. After favorable report and valuation being obtained, the Minister was empowered to enter into a provisional contract for the purchase of land, copies of which contract and report were to be laid before Parliament; and if the Legislative Assembly, by resolution, declared it expedient to acquire such land, a Bill for the purchase thereof was introduced. The price to be paid by settlers of the land so acquired was so fixed as to cover cost of purchase, survey, and subdivision, value of land absorbed by roads and reserves, cost of constructing roads, cost of clearing, draining, fencing, and other improvements which the Board of Land and Works might effect prior to disposal as farm allotments, and any other incidental expenses. Any person aged 21 (not holder of rural land valued at £1,250, or who would not thereby become holder of land exceeding such value) could be granted one farm allotment under conditional purchase lease.

The purchase money, with interest, at 4½ per cent., had to be paid by 63, or a lesser number of, half-yearly instalments, two of which were required to accompany the application. The conditional purchase lease issued was for a term not exceeding 31½ years, and contained, so far as consistent, the usual conditions of perpetual leases, and also the following:—(*a*) Improvements to the value of 10s. per acre; or, if Board so determined, to value of 10 per cent. of the purchase money, before end of third year; and to the same extent, in addition, before the end of the sixth year; (*b*) Personal residence or by wife or child over eighteen years of age for eight months during each of first six years; (*c*) Not to transfer, assign, mortgage, or sublet within first six years; and any other conditions prescribed by the regulations. The fee-simple could be acquired after the first six years, if conditions complied with, on payment of balance of principal. Forfeiture for non-payment of an instalment, could be prevented by payment thereof, with a penalty of 5 per cent., within three months, or of 10 per cent. within six months. Any tenant of land acquired by the Crown from his landlord could be granted a prior right to conditional purchase of any area not exceeding £1,250 in value, or £2,000 if there were a homestead. Power was given to close unused roads, and portions of the land acquired could be used for experimental farms.

Closer Settlement Act 1904

On 30th November, 1904, an important Act was passed further providing for the acquisition and disposal of land for closer settlement—this Act, the Land Act of 1901, and any other Acts amending the same being now treated as the land legislation of the State. The Act of 1904 is administered by a Board consisting of three persons appointed by the Governor in Council intrusted with power to acquire, either by agreement or compulsorily, blocks of private land in any part of the State for the purposes of closer settlement. Such land as may be acquired by the Board is to be purchased by money the proceeds of the sale of debentures or stock under this Act; or, with the consent of the Treasurer, of Victorian Government Stock. The Governor in Council during the first five years of the operation of the Act may for the purposes of the Act increase the amount of the Victorian Government Stock by a sum not exceeding £500,000 in any one financial year; or, instead of increasing the Victorian Government Stock, may issue debentures for the whole or any portion of such sum. The principal and interest on all stock and debentures issued is to be a charge on the Closer Settlement Fund created from all moneys received by the Board, and the fund heretofore known as the Farm Settlements Fund transferred to the Board.

Acquisition and Administration.

The Minister administering the Act may authorize the inspection of private land, and the Board shall affix its value when deemed suitable. If the Minister agrees with the Board's valuation the land may be acquired either by auction or other sale of the estate, or by purchase or exchange of land equivalent at a price not exceeding the Board's valuation, or by compulsory acquisition by resolution passed by both Houses of Parliament. Where money has been lent on land unless with the consent of the mortgagee, no less sum shall be paid as purchase money for such land than the amount of money so lent

with interest up to time of purchase. Difference of opinion as to the value of any land desired by the Board is to be referred to a compensation Court for determination.

The Board may dispose of all lands thus acquired on conditional purchase, lease as farm allotments, or as allotments for workmen's homes, or as allotments for agricultural labourers at fixed prices. The farm allotments to consist of an area of land not exceeding £1,500 in value, the workmen's homes £100, and the agricultural labourers £200. No lease of an allotment shall be granted to any person who is already the holder of land of the value of £1,500 (township land excepted), or who would thereby become the holder of land exceeding the value of £1,500, and not more than one allotment is to be held by one lessee. Conditional purchase leases are to be issued for such a term of years as may be agreed upon by the lessee and the Board, and provision is made for payment of the value of the allotment, and interest at a rate of not less than £4 10s. per cent. per annum, by not more than 73 half-yearly instalments. The leases provide for the destruction of vermin, the eradication of noxious weeds, for fencing and its maintenance, and other improvements of a permanent character; residence of eight months each year; and that the lessee shall not transfer, assign, mortgage, sublet, or part with possession of the whole or any part of the allotment within the first six years of the lease, special provision being made in cases of death or insolvency. A Crown grant may be acquired at any time after twelve years. In the case of workmen's home allotments, the lessee must, within one year from the date of the lease, fence the allotment and erect a dwelling house, and no more than one dwelling house and one place of business shall be erected upon any one allotment. The condition regarding improvement for the lease of agricultural labourers' allotments is that the lessee must within one year erect a dwelling house upon the allotment, and within two years fence the allotment. Advances out of the fund up to £50 may be made by the Board to lessees of workman's home and agricultural labourers' allotments. Such advances, with interest at 5 per cent., are made repayable by equal half-yearly instalments extending over a period not exceeding sixteen years. In lieu of such advance, and subject to similar conditions, the Board may cause cottages to be erected at a cost not exceeding £100 each.

Under the authority of the Act of 1898, the following purchases were made:— Estates purchased.

(1) The Wando Vale Estate, containing 10,446 acres, situated in the County of Dundas, was purchased on the 23rd March, 1900, for £63,984.

(2) The Walmer Estate, 13,769 acres, in the County of Borung, on the 23rd October, 1900, for £44,750.

(3) Brunswick Lands—91 acres, in the County of Bourke, on the 7th November, 1900, for £2,644.

(4) The Whitfield Estate—4,246 acres, in the County of Delatite, on the 1st November, 1900, for £36,095.

(5) The Eurack Estate—5,108 acres, in the County of Grenville, on the 13th November, 1901, for £53,640.

The total of the purchase money and the incidental expenses, amounting to £210,095, represents part of a loan of £400,000 raised under the authority of Acts No. 1602 and No. 1749 for the purposes of closer settlement. The vendors of the Whitfield and Eurack estates accepted £56,095 in Government 3 per cent. stock, and the balance in cash, the total cash payment over the five estates being £153,245. A sum of £56,544 has been repaid to the Farm Settlements Fund up to the 30th June, 1905, and of this amount £28,477 has been transferred from that fund to revenue to meet interest due to stock holders; £23,510 has been drawn from the same fund for redemption and cancellation of stock; the balance to the credit of the fund on the 30th June, 1905, being £3,367, now transferred under the authority of the *Closer Settlement Act* 1904, to the Closer Settlements Fund, managed by the Lands Purchase and Management Board. The balance of the unredeemed stock was £186,585.

Wando Vale, Walmer, Eurack, and Whitfield Estates.

As all these estates have been purchased since the end of 1900, it will be of interest to see what amount of work and settlement has taken place on the lands omitting the lands purchased for workmen's homes. The agricultural statistics of the last year show that the number of holdings on the four estates was 186, as against 120 in the previous year; but it is probable that there was some deficiency of collection in the former year. The estates are all fully occupied. The hands employed in 1904 were 270 men and 160 women. The total amount of land under crop was 9,719 acres; in fallow and sown grasses, 2,773 acres; whilst 21,400 acres still remained under natural grasses. The agricultural produce was 139,300 bushels of grain of various kinds; 2,276 tons of hay, as well as potatoes, onions, and other root crops. The stock on all the holdings numbered 885 horses, 4,212 cattle, 11,511 sheep, and 1,692 pigs. There were 27 cream separators at work, and 2,000 lbs. of butter was made at Wando Vale, 3,162 lbs. at Walmer, and 2,240 lbs. at Whitfield; at Eurack, no butter was made; 14,966 lbs. of hams and bacon were cured on the four estates. The wool produced was 61,949 lbs., and the number of animals slaughtered, 1,701. The general progress made during last year will be seen from the following tables:—

CLOSER SETTLEMENT: RETURN FOR 1903-4 AND 1904-5.

	Wando Vale.		Walmer.		Eurack.		Whitfield.	
	1903–4.	1904–5.	1903–4.	1904–5.	1903–4.	1904–5.	1903–4.	1904–5.
Number of holdings returned	28	66	20	39	42	46	30	35
Area occupied .. acres	10,446	10,446	13,769	13,769	5,108	5,108	4,246	4,246
Area under crop ,,	2,661	3,442	3,914	4,624	749	440	914	1,213
Area in fallow .. ,,	7	..	884	2,472	..	3	55	50
Area under sown grass ,,	39	109	..	..	9	21	16	118
Hands employed, number —Males	63	83	34	61	54	62	54	64
Hands employed, number —Females	37	50	21	24	38	45	38	41
Area under cereals acres	2,881	2,640	3,914	4,166	707	166	972	595
Area under root crops ,,	27	30	..	..	42	52	135	50

CLOSER SETTLEMENT: RETURN FOR 1903-4 AND 1904-5—*continued.*

	Wando Vale.		Walmer.		Eurack.		Whitfield.	
	1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.	1903-4.	1904-5.
Produce of cereals—								
Grain .. bushels	22,920	74,115	57,082	47,560	7,363	1,913	20,714	15,712
Hay .. tons	996	1,362	560	353	1,044	198	362	363
Lucerne .. ,,	2	..	..	..	..	21	3	1
Produce of root crops—								
Potatoes .. tons	..	44	..	..	..	24	..	142
Mangel wurzel ,,	33	23	..	..	258	31	40	..
Beet, Carrots, Parsnips, &c .. ,,	..	..	..	..	75	..	..	..
Onions .. ,,	20	..	..	..	103	15	3	..
Stock returned—								
Horses and foals ..	265	339	119	249	138	145	177	152
Horned cattle ..	1,083	1,274	71	312	1,047	1,435	1,001	1,191
Sheep	3,536	7,264	1,421	4,044	248	163	341	50
Pigs	259	584	20	65	185	554	294	489
Number of cream separators in use	12	19	1	5	..	..	4	3
Butter made .. lbs.	10,722	2,000	..	3,162	..	..	..	2,240
Cheese made .. ,,	1,400	..	..	..	..	..	..	..
Hams and bacon cured ,,	9,289	9,006	..	1,710	..	950	2,958	3,300
Wool produced ,,	17,142	33,595	2,684	27,354	300	850	1,330	150
Stock slaughtered, number of animals	874	1,089	80	443	..	43	446	126

CLOSER SETTLEMENT: PRODUCTION 1903-4 AND 1904-5.

		1903-4.	1904-5.	Increase.	Decrease.
Area under crop	acres	8,238	9,719	1,481	..
Area in fallow and sown grasses	,,	1,010	2,773	1,763	..
Hands employed, male ..	No.	205	270	65	..
Hands employed, female ..	,,	134	160	26	..
Area under cereals	acres	8,474	7,567	..	907
Area under root crops ..	,,	204	132	..	72
Produce—					
Grain	bushels	108,079	139,300	31,221	..
Hay	tons	2,962	2,276	..	686
Stock—					
Horses	No.	699	885	186	..
Cattle	,,	3,202	4,212	1,010	..
Sheep	,,	5,546	11,511	5,965	..
Pigs	,,	758	1,692	934	..
Cream separators	,,	17	27	10	..
Butter	lbs.	10,722	7,402	..	3,320
Cheese	,,	1,400	Nil	..	1,400
Hams and bacon	,,	12,247	14,966	2,719	..
Wool	,,	21,456	61,949	40,493	..
Stock, slaughtered	No.	1,400	1,701	301	..

In the short time these estates have been settled fair progress has been made, and there is now a reasonable hope of their ultimate prosperity. During the past year, the hands employed have increased by 91, the land under cultivation and in fallow by 3,244 acres, the grain crops by 31,221 bushels, the live stock, horses,

cattle, sheep, and pigs by 8,095 head, and the stock slaughtered by 301 head. A decrease occurred in the quantity of butter and cheese returned—principally at the Wando Vale Estate, where in 1903-4, 10,272 lbs. of butter and 1,400 lbs. of cheese were made; whereas in 1904-5, the quantity was only 2,000 lbs. of butter and no cheese. On this estate, however, the live stock has considerably increased, notably the sheep. In 1904-5, there were 37,200 head of sheep, and 16,453 lbs. of wool more than in the previous year. Although an increase of ten cream separators is shown, the cream appears to have been forwarded to butter factories already established in the neighbourhood of the settlement. Assuming that each holding consists of the average household, there would probably be a population of close upon 1,200 persons on the estates.

Workmen's homes.

At Brunswick, 4 miles from the city, 91 acres of land were purchased on 17th October, 1900, for £2,644, where workmen might devote their spare time and labour to create for themselves comfortable homes under healthy and cheerful conditions. After providing for roads and public reserves, it was subdivided into 56 workmen's homes allotments, and made available for application on 4th February, 1901, under certain conditions, amongst which residence is compulsory for the first six years and improvements of a stated value have to be effected. All these allotments have been disposed of and the general appearance of the district has been quite changed. There is a population of 227 on the Estate, and improvements to the amount of £8,352 have been effected by the lessees. Two bridges have been erected by the Department, and the Metropolitan Board of Works have laid down water mains along the principal streets. A public hall and also a fire brigade station have been erected on the estate.

At Warrnambool 46 acres of Crown land was subdivided and made available 17th June, 1903, in 28 workmen's homes allotments. At Bacchus Marsh. the old police paddock, of 13 acres, was subdivided into 1-acre allotments, and disposed of to local workingmen, 5th November, 1903. At Leongatha. 53 acres of the southern portion of the labour colony were subdivided into five small farm allotments. and made available, 27th November, 1903. Since then the Government has secured the Dal-Campbell Estate, of 45 acres, adjoining the Brunswick sub-division, and made it available for settlement; also thirty acres in the city of Footscray, which has been cut up into ¼-acre allotments, and through which streets have been formed and water mains laid preparatory to sale. At Mortlake, 2,349 acres of Crown lands were subdivided into thirteen farm allotments and fifteen agricultural labourers' allotments, and disposed of on 18th April, 1905. Other sites at Clifton Hill, Ballarat, &c., are being secured, and will be subdivided and disposed of later on.

Up to the end of the year 1904, no land was acquired under the authority of the Act of that year; but up to date (June, 1905) the following purchases have been sanctioned:—

Wyuna, 23,016 acres, in the Goulburn Valley, for £120,834.
Springvale, 3,396 acres, in Kiewa River Valley, for £25,895.
Memsie, 10,027 acres, on the Loddon River, for £57,158.
Overnewton, 11,336 acres, Keilor Plains, for £70,540.

The Springvale Estate has been subdivided into twenty farm allotments, and will be made available forthwith; the other three properties are now being subdivided.

Waterworks.—Domestic Supply

Victorian waterworks.

The Victorian Waterworks are of two classes, viz., those designed chiefly for domestic supply and those intended for irrigation purposes. By an Act of the year 1890, waterworks trusts were constituted for the purpose of controlling the stock and domestic supply within the area of their respective districts. Prior to the constitution of these trusts, extensive works for the storage and supply of water for domestic and mining purposes had been constructed by the Government and by local bodies in various parts of the State. The principal of these—the Yan Yean Waterworks—has been transferred to the Melbourne and Metropolitan Board of Works. The following table contains a summary of the cost of all waterworks controlled by the Government, Trusts, Corporations, and the Metropolitan Board of Works, and the reservoirs for the supply of water on goldfields:—

Cost of Waterworks to 30th June, 1904.

Waterworks under—	Cost.
	£
Government—Domestic—	
Coliban	1,153,946
Geelong	441,259
Broken River	14,853
Kerang Lakes	9,401
Mallee Supply	134,628
Government—Irrigation—	
Goulburn River	562,026
Loddon River	153,603
Kow Swamp	179,889
Trusts—Irrigation—	
21 Working Trusts	1,056,704
3 Trusts (now transferred for domestic supply) ..	9,938
2 Drainage and Irrigation Trusts	31,994
5 Abandoned Trusts	22,014
Waterworks Trusts (73)—Domestic—	
By free Grant from State, £72,219; from Loans, £979,205	1,051,424
Municipal Corporations (27)—Domestic	675,161
Metropolitan Board of Works—Domestic	3,753,024
Municipal Control—on Goldfields—Mining and Domestic	55,860
Miscellaneous Expenditure	99,398
Total	9,405,122

Government Works: Domestic Supply.

Coliban Waterworks.

The Coliban Scheme provides water to the Bendigo and Castlemaine districts for domestic and mining purposes, as well as for irrigation to a limited extent. The main reservoirs of this scheme are

on the Coliban River, one about half a mile below the junction of the Little Coliban, and the other at Malmsbury, with capacities respectively of 4,100 and 3,337 million gallons. The cost of the works to the 30th June, 1904, was £1,153,946; whilst the gross revenue during the year 1903-4 was £28,279; and the expense of maintenance and supervision, £10,591. The net revenue was thus £17,688, being equivalent to £1 10s. 8d. per cent. on the capital cost. The deficiency in 1903-4, after allowing interest on the capital cost at the rate of 3½ per cent., was £22,700.

Geelong Waterworks.

The Geelong Waterworks provide water for domestic supply to Geelong and suburbs. The storage works in this scheme, the chief of which are the Upper and Lower Stony Creek reservoirs, have a capacity of 571 million gallons. The Upper Reservoir receives supplies through a channel from the Eastern Morabool River to supplement the run off from the local catchment. The whole scheme has cost up to the 30th June, 1904, £441,259. The gross revenue for 1903-4 was £13,010, and the cost of maintenance £3,986. The net revenue was thus £9,024, or £2 0s. 11d. per cent. on the capital cost. After allowing interest on capital at 3½ per cent., the deficiency for 1903-4 was £6,420.

Other Government works.

The Broken River Waterworks supply water to Tungamah, Numurkah, and Shepparton. The Kerang Lakes are estimated to contain 4,000 million gallons, and supply the district surrounding the lakes. The Mallee Water Supply is obtained from Lake Lonsdale Reservoir, containing 1,981 million gallons, and the Lower Wimmera storages containing 125 million gallons.

The following return shows full particulars of these schemes:—

WATERWORKS UNDER GOVERNMENT CONTROL AT 30TH JUNE, 1904, FOR STOCK AND DOMESTIC PURPOSES.

Town or District Supplied.	Reservoir or Source of Supply.		Cost, Including Expenditure on Channels and Reticulation
	Name.	Storage Capacity.	
		Gallons.	£
	COLIBAN.		
	Upper Coliban ..	4,100,000,000	
	Malmsbury ..	3,337,000,000	
Taradale	Taradale	65,000	
Fryerstown	Crocodile Gully ..	5,407,000	
Maldon ..	Green Gully ..	1,500,000	
	Pumping Station Basin	350,000	
	Upper Reservoir ..	4,800,000	
	Lower Reservoir ..	3,428,000	
Castlemaine, Chewton and Harcourt	Expedition Pass ..	120,000,000	
	Monument Hill ..	1,000,000	
	Slate Quarry ..	30,000	
	Barker's Creek ..	629,135,000	
	Harcourt	20,000	

WATERWORKS UNDER GOVERNMENT CONTROL AT 30TH JUNE, 1904, FOR STOCK AND DOMESTIC PURPOSES—*continued.*

Town or District Supplied.	Reservoir or Source of Supply.		Cost, Including Expenditure on Channels and Reticulation.
	Name.	Storage Capacity.	
		Gallons.	£
	COLIBAN—*continued.*		
Bendigo and Eaglehawk	Spring Gully ..	150,000,000	1,153,946
	Upper Grassy Flat ..	58,860,000	
	Lower Grassy Flat ..	26,800,000	
	Solomon's Gully ..	1,250,000	
	High Level Pipe Head Basin	2,000,000	
	Big Hill	68,000,000	
	Big Hill Tank ..	300,000	
	Crusoe	320,000,000	
	New Chum Tank ..	23,000	
	Sparrowhawk ..	1,500,000	
Lockwood and Marong	Green Gully ..	2,500,000	
	Marong Pipe Head ..	330,000	
Raywood and Sebastian	Lightning Hill, Blue Gully Jacket	7,000,000	
	Raywood	2,500,000	
	Sebastian	239,000	
	GEELONG.		
Geelong and Suburbs	Upper Stony Creek ..	417,000,000	441,259
	Lower Stony Creek ..	143,000,000	
	Anakie Pipe Head Basin	1,280,000	
	Lovely Banks ..	6,000,000	
	Montpellier ..	3,000,000	
	Newtown Tank ..	500,000	
	BROKEN RIVER.		
Tungamah, Numurkah, and Shepparton	Broken River Works	..	14,853
	KERANG LAKES.	Cubic feet.	
District surrounding Lakes	Reedy, Middle, Third Charm, Race-course, Cullen, Kangaroo, and Tutchewop Lakes	4,000,000,000	9,401
	MALLEE WATER SUPPLY.		
North-Western District, including Wimmera and Mallee	Lake Lonsdale Reservoir	1,981,000,000	134,628
	Lower Wimmera Storages (Drung Drung, Dimboola, Antwerp, and Jeparit Weirs)	125,000,000	
Total ..	.. .. ..	..	1,754,087

IRRIGATION.

The problem of irrigation is one which, notwithstanding the outlay of large sums of money, yet remains to be solved. It may seem futile to attempt an objection to a policy which, almost self-evidently, cannot be a false one; yet there are many matters which must of necessity weigh upon our deliberations upon the subject. The cost of irrigation works in Victoria, up to 30th June, 1904, was, exclusive of interest, over two million pounds; and for this enormous outlay, only about 157,000 acres were irrigated in 1904, although the area in irrigation trust districts is over two and a quarter million acres. That the farming community should be so remiss in taking advantage of this means of improving their produce-yielding lands is a matter for wonderment, especially in a State like Victoria, where the distance from the centre of the world's markets renders necessary for successful competition therein the exercise of every method of increasing the return. At Mildura, where the settlers have had to encounter many and unforeseen difficulties, and where they were placed at enormous disadvantages in the way of markets—irrigation, improved methods of culture, and increased production have overcome many of these difficulties, and the settlement is now in a fair position to be successful and prosperous, the latest accounts being of a most satisfactory character. There is no reason why all the settlers in any district, which may have the advantages of irrigation, should not have as bright and prosperous a future before them as those at Mildura. Although the efficacy of irrigation works has more than once been questioned, and doubt has been expressed as to the wisdom of incurring expense in this direction, which by some is regarded somewhat in the light of a costly experiment—yet it must be remembered that a policy of national irrigation is now by no means in an experimental stage. Its value has been too often demonstrated in various countries of the world, possessing perhaps fewer facilities than Victoria. The Honorable Alfred Deakin, who made special visits to America and other places, twenty years ago, to inquire into the most modern developments of irrigation, furnishes a wealth of information as to the extent and utility of the system. His conclusions are embodied in reports on irrigation in Western America, in Egypt, and in Italy. There can, he says, be no doubt as to its success in these countries. In the older countries of the world, where irrigation has been carried on extensively, its value has ever been perceived. Egypt is a natural desert, but irrigation transformed it into the garden of the ancient world. The decadence, as a producing country, into which it fell, was due to the neglect of its people to conserve the water in the proper seasons. The British Government has been so fully alive to the necessity of this artificial means of watering the country, that enormous sums have been expended in providing the means whereby irrigation may be practised even much more extensively than in days long gone by. In China, the valley of the Yang-tse-Kiang, where probably the population is denser than in any other part of the world, is reticulated by a network of canals, and indeed, it would be an impossibility for these millions of people to live were it not

for the intense culture which irrigation induces. In Mexico, irrigation was practised before the advent of the Spaniards. In the United States, the territory about Salt Lake City has been converted from a wilderness into a highly and intensely cultivated country. The productiveness of California has also been enormously increased; whilst other territories of the Continent have practised irrigation extensively. Much has been done in France, Italy, and Spain, particularly in the two first named countries, in artificially watering fruit, cereals and pasture lands.

Irrigation in Victoria.

In view of the importance which irrigation must of necessity have upon the future welfare and prosperity of the State, it may be well to see what has already been done in this direction.

The more important irrigation works, or those connected with the principal rivers (which form the main supply in some cases for several local schemes), are undertaken by the State. These are known by the name of National Works, or those works which are of such magnitude as to affect sources of water supply, and command such large areas of country that it is advisable that they should be constructed by and retained under the direct control of the State, and declared by Act of Parliament to be National Works. Full details are in the following statement:—

WATERWORKS UNDER GOVERNMENT CONTROL AT 30TH JUNE, 1904, FOR IRRIGATION SUPPLY.

Town or District Supplied.	Reservoir or Source of Supply.		Cost, Including Expenditure on Channels and Reticulation.
	Name.	Storage Capacity in Cubic feet.	
	GOULBURN RIVER.		£
Rodney Trust, Echuca and Waranga Trust, and the Campaspe-Loddon District	Goulburn Weir ..	900,000,000	562,026
	Waranga Reservoir ..	8,600,000,000	
	LODDON RIVER.		
Tragowel Plains, East Boort, North Boort, Wandella, Twelve Mile, Leaghur, and Meering Irrigation, &c., Trusts, and the Loddon United Waterworks Trust	Laanecoorie Weir ..	610,000,000	153,603
	KOW SWAMP.		
Gunbower West, Macorna North, Kerang East, Kerang South, Dry Lake, Wandella and Marquis Hill Irrigation, &c., Trusts	Kow Swamp Reservoir	1,780,000,000	179,889
Total ..	.. .. ..	11,890,000,000	895,518

Water Conservation.

Extracted from a paper by G. Garson, Esq., Deputy Chief Engineer of Water Supply, Victoria, published in the "Victorian Settlers' Guide."

One of the most promising directions in which closer settlement may be expected to develop is in connexion with the national schemes of water conservation and irrigation inaugurated some fourteen years ago by the construction of the Goulburn weir. This work, which is situated about eight miles up stream from Murchison, serves to raise the water level of the river so that the water may be diverted therefrom. A channel of 120 feet mean width, and seven feet carrying depth, has been constructed on the west bank of the river to the Waranga basin, now in course of construction—a distance of 24 miles—and is capable of filling that large storage of nine thousand million cubic feet capacity in fifty days.

The construction of the reservoir embankment, 4¼ miles in length, and about 24 feet high, commenced in December, 1902, will be completed, and the reservoir filled, during the winter of 1906. The area commanded by the existing works comprises the Rodney Irrigation Trust, 275,000 acres in extent, and the Echuca and Waranga Waterworks Trust, 300,000 acres in extent. The former is completely reticulated with irrigation channels, while the latter has a very effective system of stock and domestic supply channels, which also serve in some measure for irrigation.

A main eastern channel, drawing its supply from the weir, will command an area of about 205,000 acres on the east side of the Goulburn as far north as the Broken Creek; while a main western channel from the Waranga Reservoir to the Loddon, crossing the Campaspe about two miles north of the town of Rochester, will, besides providing an irrigation supply for the Echuca and Waranga Trust district before mentioned, command a further area of 627,000 acres between the Campaspe and the Loddon. Of this area, about 270,000 acres (comprising the Tragowel Plains and other Loddon River irrigation trusts) have a complete system of irrigation channels. These are supplied from the Loddon River, which is regulated by the Laanecoorie weir, a national work constructed in 1891. The supply from this source, though valuable in winter and spring, is quite inadequate for the summer requirements of the district; and the carrying of the Goulburn waters westward is required to make good the deficiency, and to place irrigation here on a satisfactory basis. The extension of the channel from the Loddon westward to Tyrrell Creek will provide an ample stock and domestic supply to the eastern Mallee as far north as Tyntynder, and embracing an area of 1,700,000 acres.

The following are the quantities of water which it is estimated will be available from the Goulburn-Waranga-Loddon scheme, delivered at the irrigators' fields, in a year of typical low river

discharge, after providing for losses by evaporation and percolation in the storages and channels :—

Cold weather irrigation, 1st July to 31st August, 162,000 acre feet.

Warm weather irrigation, 1st September to 30th April, 405,000 acre feet.

The total area of the districts commanded is 1,400,000 acres; and the irrigable area about 1,200,000 acres. Exclusive of the supply for the irrigation of cereals and other crops during the months of July and August, the water available would thus serve to irrigate 405,000 acres to a depth of 12 inches, or one-third of the whole area commanded, during the summer period.

Careful estimates of annual expenditure have been prepared by the Water Supply Department in connexion with this scheme, which shows that the cost of water delivered to the irrigators will average about 4s. per acre foot.

Within the area of the Rodney Trust, which, as mentioned above, has a complete system of irrigation channels, considerable progress has been made with irrigation over an extended area; and it is here we find practical evidence of the success attending the application of water to farming lands in the Goulburn Valley.

The assured prospects of rapid development in irrigation are to be found in the dairying and stock fattening industries, which, with the aid of irrigation, are carried on under the most favorable conditions in our northern districts. The rapid increase of the area under lucerne in Rodney during recent years, together with the successful establishment of local butter factories, give ample proof of this. Rodney is not singular in this respect. Similar results may be observed throughout our northern areas wherever water is available for summer irrigation.

Turning to the Kow Swamp irrigation district, supplied from the national works of the same name :—Water is diverted from the River Murray at Torrumbarry head works, when the river reaches a height of 5 feet above summer level. Up to this point no diversion takes place. During the winter months the Kow Swamp storage, containing about eighteen hundred million cubic feet, is filled; and, in addition, water is conveyed direct from the river, through a main channel 42 miles in length, to supply the irrigation trusts dependent on the system; while, during the summer months, when the river is low, the storage is drawn upon for the necessary supplies. The works have proved most successful and have contributed greatly to the prosperity of the district (84,000 acres in extent), supplied by them.

Other national works are the Kerang Lakes (eight in number), which have been linked together by conecting channels, and are filled in winter by diversion from the River Loddon at Kerang, supplemented by the Kow Swamp works. These lakes, intended primarily as storages for stock and domestic supply, are also used for irrigation, the water being raised by pumping to the level of the fields to be irrigated.

The Goulburn-Waranga-Loddon scheme, now being actively carried out, commanding an area of about 1,240,000 acres of land admirably adapted for irrigation, stands out prominently as the principal irrigation scheme of Victoria. The water supply available from the Goulburn weir at Waranga Reservoir, great as it is, can be supplemented, when the necessity arises, by storage on the Upper Goulburn, where there are several sites suitable for the construction of large reservoirs.

To properly develop the resources of the Goulburn-Loddon district by means of the water which will be available from the Goulburn weir and the Waranga Reservoir, a large increase of the farming population will be necessary. The obligations placed on the landholders to recoup to the State, within a reasonable time, the annual expenditure on the works, will be a strong incentive to make them use the water allotted to their lands to the best advantage, and to do so labour must be employed. The cultivation of cereals, mainly carried on by machinery, will probably, to a considerable extent, be given up in favour of fodder crops required for dairying and the raising of stock, which involve the employment of much more labour. The increased productiveness resulting from irrigation will inevitably tend to reduce the size of the farms by enabling a smaller area to maintain a family in comfort. Dairy farming is most profitably carried on when the farm is small and can be worked by the owner and his family with little outside assistance. Wheat-growing, on the contrary, while it requires the employment of comparatively few hands, is most profitably carried on in large areas.

The success of the Goulburn scheme, when realized, will undoubtedly lead to others being undertaken, the Murray River plains lying to the east of the Goulburn offering great inducements to the undertaking of irrigation schemes from the Murray. The works involved, however, would be partly of an Inter-State character; and, for this and other reasons, it will probably be some considerable time before they can be entered upon.

Besides national works supplying water for irrigation, there are four trusts, viz., Benjeroop and Murrabit, Cohuna, Koondrook and Myall, and Swan Hill, comprising a total area of 147,000 acres, which draw their supplies partly by gravitation and partly by pumping from the river Murray, between the Kow Swamp head-works and Swan Hill. In spite of the heavy cost entailed by pumping, the advantages accruing are found to justify the annual outlay.

Present position of irrigation trusts

Originally there were 31 public water trusts established throughout the State. Of these, one (Dookie) is now used solely for the supply of water to the College, and is in no sense a public trust. Two (Emu Valley and Harcourt) have been transferred to and amalgamated with the Coliban scheme for domestic service. Two (Carrum and Yatchaw) are principally drainage trusts. Five are practically abandoned. The remaining 21 are still carrying on irrigation works, but to a very limited extent. The following table shows their general

financial condition, and the very meagre results that have followed the enormous outlay : —

IRRIGATION, ETC., TRUSTS—COST OF IRRIGATION WORKS, AND AREA OF LAND IRRIGATED.

Trust.	Cost of Works.			Written off.		Arrears of Interest Accumulated from 30.6.99 to 30.6.04.	Land capable of being Irrigated	
	Advances.	Grants. *	Total.	Capital.	Interest to 30.6.99.		Area of Trust District—exclusive of Roads and Reserves.	Irrigated
	£	£	£	£	£	£	Acres.	Acres.
WORKING TRUSTS.								
Bacchus Marsh	13,906	..	13,906	8,906	5,486	97	910	342
Bairnsdale ..	31,439	..	31,439	23,439	7,739	156	..	..
Benjeroop and Murrabit	12,936	..	12,936	7,200	4,379	340	19,740	7,347
Boort North ..	6,978	238	7,216	4,867	2,835	73	10,000	1,242
Boort East ..	21,567	112	21,679	14,866	7,902	445	30,000	1,467
Campaspe ..	62,000	..	62,000	52,685	18,131	182	44,590	1,272
Cohuna ..	151,213	334	151,547	93,968	46,770	3,390	94,230	29,452
Dry Lake ..	1,704	20	1,724	686	567	26	1,510	1,236
Gunbower West	5,889	..	5,889	..	..	274	9,790	3,943
Kerang East ..	14,025	256	14,281	6,984	4,910	652	18,100	7,961
Koondrook and Myall	14,404	..	14,404	12,080	5,100	33	12,590	5,629
Leaghur and Meering	5,043	8	5,051	2,543	1,864	49	10,300	1,391
Macorna North	18,557	18	18,575	8,082	4,337	797	27,300	12,776
Marquis Hill ..	14,477	262	14,739	9,076	5,466	543	10,930	3,551
Rodney ..	222,798	11,789	234,587	149,949	52,726	1,404	275,000	24,491
South Kerang ..	633	..	633	..	..	22	2,630	1,072
Swan Hill ..	24,800	..	24,800	19,799	10,126	186	14,400	9,346
Tragowel Plains	159,848	1,871	161,719†	124,534	80,141	1,658	180,900	31,768
Twelve Mile ..	5,050	53	5,103	3,250	2,343	64	9,030	2,068
Wandella ..	30,754	444	31,198	20,929	8,280	399	23,200	9,595
Western Wimmera	213,943	9,335	223,278	132,835	51,218	2,782	1,578,030	1,574
Total Working Trusts	1,031,964	24,740	1,056,704	696,678	320,320	13,572	2,373,180	157,523
TRANSFERRED TRUSTS.								
Dookie ..	630	..	630	630	171	..	..	..
Emu Valley ..	8,166	..	8,166	8,166	2,907	..	..	..
Harcourt ..	1,142	..	1,142	1,112‡	335	..	..	..
Total Transferred Trusts	9,938	..	9,938	9,908	3,413	..	..	..

* Free gift from State towards construction of headworks. The whole originally made to Waterworks Trusts, Act 760, £100,000 ; but portion transferred to Irrigation Trusts as works were taken over from the Waterworks Trust.

† Tragowel Trust works constructed by Trust, £3,209 (not included in cost above), taken over by State under Loddon Works.

‡ £30 paid to redemption fund by Trust.

IRRIGATION, ETC., TRUSTS—COST OF IRRIGATION WORKS, AND AREA OF LAND IRRIGATED—*continued.*

Trust.	Cost of Works.			Written Off.		Arrears of Interest Accumulated from 30.6.99 to 30.6.04.	Land capable of being Irrigated.	
	Advances.	Grants. *	Total.	Capital.	Interest to 30.6.99.		Area of Trust District —exclusive of Roads and Reserves.	Irrigated
	£	£	£	£	£	£	Acres.	Acres.
DRAINAGE TRUSTS.								
Carrum ..	25,732	..	25,732	7,732	7,146	1,186	..	..
Yatchaw ..	6,262	..	6,262	1,661	514	90	..	..
Total Drainage Trusts	31,994	..	31,994	9,393	7,660	1,276	..	..
ABANDONED TRUSTS.								
Lerderderg ..	447	..	447	447	169	..	..	..
Millewa ..	973	..	973	..	..	..	..	..
Pine Hills ..	2,051	243	2,294	2,050	1,065	..	..	..
Torrumbarry Nth.	12,300	..	12,300	6,300	4,612	1,200	..	..
Werribee ..	6,000	..	6,000	..	..	3,752	..	..
Total Abandoned Trusts	21,771	243	22,014	8,797	5,846	4,952	..	..
Total all Trusts	1,095,667	24,983	1,120,650 §	724,776	337,239	19,800	2,373,180	157,523

* Free gift from State towards construction of headworks. The whole originally made to Waterworks Trusts, Act 760, £100,000; but portion transferred to Irrigation Trusts as works were taken over from the Waterworks Trust.

§ Exclusive of £58,700 advanced to the Mildura Irrigation Trust.

From these figures it would appear that £1,120,650 has been expended in constructing irrigation works, exclusive of national works, £895,518. Of this, £9,938 was advanced to trusts since transferred, £31,994 to drainage trusts, and £22,014 to trusts since abandoned, leaving the total amount invested in working trusts, £1,056,704. There has been written off the capital a total of £724,776—£9,908 from transferred trusts, £9,393 from drainage trusts, £8,797 from abandoned trusts, and £696,678 from present working trusts. The total amount of interest written off up to 30th June, 1899, was £337,239—£3,413 being from transferred trusts, £7,660 from drainage, £5,846 from abandoned, and £320,320 from trusts now in operation. The interest accumulated to 30th June, 1904, was £19,800—£1,276 belonging to drainage, £4,952 to abandoned, and £13,572 to operating trusts. It will be seen that out of a total cost of £1,477,689 (capital and interest) we have arrived at the result of having provided water to irrigate land

which is capable of being irrigated to the extent of 2,373,180 acres, and out of this all we have irrigated is 157,523, or 6 per cent., equivalent to a capital cost of nearly £10 per acre.

Full particulars respecting the various irrigation trusts now in operation are furnished in the following statements:—

Bacchus Marsh Trust.

This service is procured by means of gravitation and a pumping plant, and supplies water required for domestic purposes as well as for irrigation. The total cost of the works (defrayed from loans) up to 30th June, 1904, was £13,906, of which £8,906 capital and £5,486 accumulated interest have been written off, £160 has been repaid, and £4,840 is still outstanding. There is also £97 interest due. The intake to the main channel is at a point on the Werribee River, in the parish of Gorrockburkhap. The channel is thence continued easterly for about three miles, and empties into a service basin at Maddingley. This basin supplies the town and railway station, and the surplus water is used for irrigation. When pumping has to be resorted to, there is only sufficient water for domestic purposes.

The rate charged is based on the municipal valuation, being 1s. 6d. in the £1 in the town area, and 2s. in the £1 in the irrigation area. An extra charge, varying from 2s. 6d. to 7s. 6d. per day, is paid for a supply of water for irrigation purposes. During the year 1904 £739 has been received from water rates, and the proceeds of the sale of water were only £52. In connexion with this scheme, there are 910 acres within the trust district, but only 342 were irrigated during the year.

Bairnsdale Trust.

The source of this supply is the Mitchell River, and there is connected with it a pumping plant and weir. £31,439 was spent up to the 30th June, 1904, £23,439 was written off under Act No. 1625, and £180 was repaid. The debt is now £7,820. Interest accumulated to 30th June, 1899, amounting to £7,739, was also written off, and £156 has accrued since. The scheme is combined with one to supply the town with water for domestic purposes, but the irrigation part of it is not yet complete. Application is being made for an additional loan of £7,800 for improving and enlarging the water supply scheme. The income derived from water rates was £690, and £209 from sale of water and other sources.

Benjeroop and Murrabit Trust.

The supply is from levee works on the river Murray and Reedy Creek. £12,936 was the total expenditure up to 30th June, 1904. £7,200 was written off and £64 has been repaid, the debt, on 30th June, 1904, being £5,672. The amount of interest due on 30th June, 1899—£4,379—was also written off. The accumulated interest from that time to 30th June, 1904, is due, and amounts to £340. Rate receipts (including arrears) during 1904 were £350, and the sale of water realized £329. Out of 19,740 acres in the trust area, only 7,347 acres are being irrigated.

Boort North Trust. The origin of the supply is the Loddon River National Works. Its cost to 3th June, 1904, was £7,216. £4,867 was written off, and £31 paid to redemption fund, leaving a total indebtedness on the date named of £2,318. £2,835 interest to 30th June, 1899, was written off, and £73 had accumulated to 30th June, 1904. The rates collected for the twelve months ended 31st December, 1904 (including arrears) was £187, and the proceeds from sale of water, also including arrears, and from other sources, were £107 for the same period. The area irrigated is 1,242 acres; that irrigable is 10,000 acres.

Boort East Trust. The source is the Loddon River National Works. The expenditure up to 30th June was £21,679. £14,866 was written off the capital account, £142 was paid to the redemption fund, leaving a total debt of £6,558 on the date named, £112 having been granted for preliminary works. £7,902 interest has been written off, and £445 is again due. During the year 1904 the receipts were—rates (including arrears) £304, and sale of water £170. The trust area is 30,000 acres, that irrigated, 1,467 acres.

Campaspe Trust. The origin of the supply is the Campaspe River. The cost up to 30th June, 1904, was £62,000. £52,685 was written off and £203 paid to redemption, leaving a debt of £9,112; £18,131 accumulated interest was also written off, and £182 interest is due. The area irrigated is 1,272 acres; that irrigable, 44,590 acres. The amount received from rates during 1903-4 was £853; and for the sale of water, £42.

Cohuna Trust. A pumping plant on the river Murray and gravitation by Deep Creek and other streams, are the means of supply. The total cost to 30th June, 1904, was £151,547; £93,968 was written off, and £512 paid to redemption, leaving £57,067 due. £46,770 interest to 30th June, 1899 was also written off, and £3,390 has accumulated since. Rates received amounted to £157, and £1,596 from sale of water. The area irrigated is 29,452 acres; the area of the trust's district is 94,230 acres.

Dry Lake Trust. The supply comes by gravitation from the Kow Swamp National Works. £1,724 was the total cost to 30th June, 1904. £686 was written off capital, and £567 off interest; £275 was repaid, and £763, besides £26 interest, is due. In this trust no rates are fixed, nor is a collection made for the sale of water, but the sum of £84 has been levied from the respective land-owners within the area. Out of over 1,510 acres capable of irrigation, 1,236 are irrigated.

Gunbower West Trust. This supply has its origin in the Kow Swamp National Works. Up to 30th June, 1904, the total cost was £5,889, and there was also £274 interest due. Nothing was written off. The receipts from rates during 1904 were £293, and from sale of water, £193. The area of the trust's district is 9,790 acres, of which 3,943 acres are irrigated.

Kerang East Trust.

This supply has its origin in the Kow Swamp National Works. The cost up to 30th June, 1904, was £14,281. £6,984 was written off capital, and £4,910 off interest, and £18 repaid towards redemption. The debt on the date named was £7,279, and the amount of outstanding interest, £652. During 1904, £794 rates have been received. For the sale of water the receipts were £284. The area irrigated is 7,961 acres; that of the trust's district, 18,100 acres.

Koondrook and Myall Trust.

This supply has its origin in the River Murray, and is connected by means of a pumping plant. £14,404 was the total cost to 30th June, 1904, of which £12,080 was written off the capital, £34 repaid, and £2,291 is still due. £5,100 accumulated interest to 30th June, 1899, was written off, and £33 has accrued since. The general rates yielded £375 during 1904, and the sale of water £298; 12,590 acres are irrigable, and 5,629 acres irrigated. During the past year a gravitation channel has been constructed from the Gunbower Creek to the existing channels, also a dam across the Gunbower Creek, with the necessary bridges and stops. The Water Supply Department granted a further loan of £2,000 for the purpose, £1,451 of which has been spent. The trust obtained a large quantity of gravitation water through this channel during 1904.

Leaghur and Meering Trust.

The source is the Loddon River National Works. £5,051 was the cost to 30th June, 1904. £2,543 was written off capital, and £60 has been repaid towards redemption, leaving £2,448 now due. £1,864 interest accumulated to 30th June, 1899, was also written off, and £49 has accrued since. £132 was received from the rates during 1904, and £89 from sale of water. The trust area is 10,300 acres, 1,391 acres being irrigated.

Macorna North Trust.

This water is supplied by means of the Kow Swamp National Works. The cost was £18,575 up to 30th June, 1904. £8,082 was written off, and there is now £10,493 due. £4,337 interest to 30th June, 1899, was written off, and £797 has accumulated since. In 1904, the rates totalled £1,095, and the sale of water £456; 27,300 acres are included in the trust area, and 12,776 acres are irrigated.

Marquis Hill Trust.

The source is the Kow Swamp National Works. On 30th June, 1904, £14,739 had been spent. £9,076 was written off capital, and £2 paid to redemption, the debt was £5,661. £5,466 interest to 30th June, 1899, was also written off, and £543 has since accrued; 3,551 acres are irrigated, but there are 10,930 acres in the trust's district. The rates received amounted to £290, and for sale of water £205 was realized.

Rodney Trust.

The district of this trust (comprising an area of about 275,000 acres) is situated in the North-Eastern portion of the County of Rodney, and the supply to it is from the Goulburn National Works. The trust's district includes about 500 miles of main and secondary channels and subsidiary works. The amount advanced to the 30th June, 1904, was £234,587. £149,949 capital, and £52,726 interest has been written off, and £2,153 repaid; leaving the indebtedness,

on the date mentioned, £82,485, exclusive of £1,404 interest. The municipal valuation of the irrigation district for 1904 was £58,977, and the rate made by the trust for that year was one of 1s. 9d. in the £1 on such valuation, amounting to £5,160. Of this rate, £3,389 was paid while current, leaving arrears amounting to £1,771. Arrears from previous years to the amount of £2,453 were also paid during the year; the total revenue received on account of rates thus being £5,842. The other principal source of revenue for the year was from sales of water for irrigation purposes, &c., in respect of which £1,873 was paid. The greater portion of the district is commanded for irrigation purposes, but the moist natural conditions prevailing for the past two irrigation seasons have retarded irrigation operations during that period. The net area watered from the works of the trust during the year 1904 was 21,210 acres, or (including re-waterings) a gross area of 24,491 acres. The trust, however, compiles its returns on this subject as for the watering seasons—comprising the last quarter of the one calendar year and the first quarter of the next. The following summary, so based, will give an idea of the progress of irrigation operations within the district for the last eleven seasons:—

Season.	Gross Area Irrigated.	No. of Irrigators.	Value Water Used.
	acres.		£ s. d.
1894–5	3,159	145	263 13 9
1895–6	22,634	384	1,481 18 6
1896–7	65,422	554	3,522 1 8
1897–8	19,311	409	1,634 0 1
1898–9	18,059	393	1,401 2 4
1899–00	28,368	490	2,324 13 5
1900–01	25,606	489	1,535 6 1
1901–02	40,813	544	2,334 1 6
1902–3	81,913*	689	5,448 11 6
1903–4	23,612†	504	1,346 17 0
1904–5‡	5,481§	264	387 0 0

* Net area, 60,000 acres (about).
† Net area, 20,268 acres.
‡ First half (to 31.12.04) of season only.
§ Net area, 5,275 acres.

South Kerang Trust.

The source is the Kow Swamp National Works. The cost to 30th June, 1904, was £633, of which only £5 has been repaid, and there is thus a sum of £628 outstanding; £22 interest is also due. All the district works were constructed by the land-holders at their own cost, so that no money was written off this trust. In 1904, £47 was received from rates, and £39 from sale of water. The trust area is 2,630 acres, but only 1,072 acres are irrigated.

Swan Hill Trust.

By means of two pumping plants, the water is procured from the River Murray. The cost to 30th June, 1904, was £24,800. In

discharge of this amount, £19,799 capital was written off, and £19 was repaid, the debt being £4,982 on the date named. In addition, £10,126 interest accumulated to 30th June, 1899, was written off, and the amount of interest accrued since is £186. The revenue in 1904 was £1,150 from water rates. Of the total trust area of 14,400 acres, there were irrigated in 1904, 9,346 acres.

Tragowel Plains Trust.

The source is the Loddon River National Works. The expenditure up to 30th June, 1904, was £161,719. £124,534 was written off, £444 was paid to redemption, leaving a debt of £36,741 on that date. £80,141 interest was written off, and that due on 30th June, 1904, was £1,658; 31,768 acres are irrigated out of the total trust area of 180,900 acres. The supply of water is quite inadequate for the whole area; not more than 10 per cent. of the irrigable allotments can be supplied. The losses in the distribution of the water are approximately 30 per cent., being greatest in minor distributaries. Water is not delivered by measure, the irrigator is charged at a rate per acre, irrespective of the quantity used. The amount of rates received during the year, including arrears, was £2,143, and £1,157 was realized from the sale of water.

Twelve Mile Trust.

The water is taken from the Loddon River National Works, and run down the Twelve-mile Creek for about four miles, where there is a weir, and an off-take from this point into a channel carries the water into the parish of Tragowel. There are two other short off-take channels, carrying water for the purposes of the trust. The cost to 30th June, 1904, was £5,103. £3,250 capital was written off, and £14 repaid, leaving due £1,839. £2,343 interest accumulated to 30th June, 1899, has also been written off, and since that date £64 has accrued. For the year 1904 revenue from rates gave £161, and sale of water £83; 9,030 acres comprise the trust's district, of which 2,068 acres are irrigated.

Wandella Trust.

The Loddon River National Works is the source of the Wandella supply. Up to 30th June, 1904, the works had cost £31,198, and £20,929 had been written off capital. Only £105 had been paid towards redemption, the total debt on the date named being £10,164. £8,280 interest accumulated to 30th June, 1899, was also written off; and since that date a further sum of £399 has accrued. In 1904, the receipts from rates, including arrears, were £280, and from the sale of water £650. The trust area is 23,200 acres, but only 9,595 acres are irrigated.

Western Wimmera Trust.

The source of supply is the Wartook Storage, with which are connected thirty-four dams and two pumping plants. Water for domestic purposes, as well as for irrigation, is supplied. Up to 30th June, 1904, £223,278 had been expended, of which £132,835 capital has been written off, £1,814 repaid, leaving due £88,629. £51,218 interest, which had accumulated to 30th June, 1899, was also written off; but £2,782 has since accrued. Rates yielded £6,573 in 1904, and sale of water £3,244. Of 1,578,030 acres in the trust area only 1,574 acres were irrigated in 1904.

'Revenue expenditure, and debt of water supply trusts.

The following return furnishes full particulars as to the revenue and expenditure of all these trusts:—

REVENUE, EXPENDITURE, AND INDEBTEDNESS OF IRRIGATION AND WATER SUPPLY TRUSTS ON 31ST DECEMBER, 1904.

Irrigation and Water Supply Trust.	Revenue from—				Expenditure on—					Amount of Government Loans outstanding, 30th June, 1904.
	Water Rates.	Sale of Water.	Other Sources	Total.	Maintenance and Management.	Salaries and Wages.	Interest and Redemption.	Other Services.	Total.	
	£	£	£	£	£	£	£	£	£	£
Bacchus Marsh	739	52	..	791	192	278	219	5	694	4,840
Bairnsdale* ..	690	205	4	899	297	291	354	12	954	7,820
Benjeroop and Murrabit	350	329	..	679	29	197	336	6	568	5,672
Boort East ..	304	170	..	474	27	129	332	4	492	6,558
Boort North ..	187	96	11	294	57	76	188	2	323	2,079
Campaspe ..	853	42	1	896	382	70	416	..	868	9,112
Cohuna ..	157	1,596	4	1,757	1,125	729	26	8	1,888	56,733
Dry Lake ..	..	84	..	84	19	1	72	..	92	743
Gunbower West	293	193	..	486	81	46	278	4	409	5,889
Kerang East ..	794	284	..	1,078	81	199	784	24	1,088	7,023
Koondrook and Myall	375	298	2	675	258	245	115	..	618	1,912
Leaghur and Meering	132	89	..	221	..	69	166	..	235	2,441
Macorna North	1,095	456	11	1,562	262	236	821	42	1,361	10,475
Marquis Hill ..	290	205	..	495	80	101	257	..	438	5,398
Rodney ..	5,842	1,873	51	7,766	2,977	651	3,193	83	6,904	70,696
South Kerang	47	39	..	86	12	31	37	..	80	628
Swan Hill ..	1,150	..	7	1,157	271	457	350	25	1,103	4,982
Tragowel Plains	2,143	1,157	65	3,365	577	810	2,006	62	3,455	34,870
Twelve Mile ..	161	83	..	244	13	40	185	7	245	1,787
Wandella ..	280	650	22	952	93	174	643	12	922	9,720
Western Wimmera	6,573	3,244	6	9,823	4,355	620	5,355	..	10,330	79,294
Total ..	22,455	11,145	184	33,784	11,188	5,450	16,133	296	33,067	328,672

* Domestic and Irrigation supply. Irrigation works not yet complete.

Drainage trusts.

One of the drainage trusts is situated at Carrum, connected with the Dandenong Creek, having 10 miles of main channel and 35 miles of branches. This trust has now passed into the hands of the Auditor-General, under the authority of the Water Act of 1890, which empowered the Audit Commissioners to take over and manage any waterworks trust, irrigation and water supply trust, or the water works of any local governing body, which might be three months over two half-years in arrear in the payment of interest on loans. The following is a statement of the present financial position of the Carrum Trust:—

CARRUM IRRIGATION AND WATER SUPPLY TRUST.—LIABILITIES AND ASSETS, 31ST DECEMBER, 1904.

Liabilities.	£	s.	d.	*Assets.*	£	s.	d.
To interest due ..	1,544	14	11	By cash in bank ..	64	1	4
Redemption due ..	417	5	11	Arrears of rates ..	555	0	0
Sundry accounts ..	70	0	0	1904 rate (approximate)	1,744	0	0
Balance	331	0	6				
	£2,363	1	4		£2,363	1	4

The loan outstanding at 31st December, 1904, was £17,950 9s. 6d.

The Yatchaw Irrigation and Water Supply Trust is also a drainage trust connected with McIntyre's Creek, having 5 miles 72 chains of main drains, and 4 miles 72 chains of branches. The revenue of the trust for the year ended 31st December, 1904, was £268, the expenditure £267.

TRANSFERRED AND ABANDONED TRUSTS.

Name of Trust.	Source of Supply.	Cost to 30th June, 1904.	Remarks.
		£	
Dookie	Tank	630	Used in connexion with the Agricultural College
Emu Valley ..	Coliban National Works	8,166	Now form part of Coliban scheme
Harcourt ..	Coliban National Works	1,142	
Lerderderg ..	Lerderderg River ..	447	These Trusts are practically defunct
Millewa ..	Murray, Goulburn, and Campaspe Rivers	973	
Pine Hills ..	Kow Swamp National Works	2,050	
Torrumbarry North	Murray River ..	12,300	
Werribee ..	Werribee River ..	6,000	

At Lerderderg, Dookie, and Pine Hills, the total cost of the works has been written off by Act No. 1625, as well as £169 at Lerderderg, £171 at Dookie, and £1,065 at Pine Hills for interest which had accumulated on 30th June, 1899. £6,300 at Torrumbarry North has been written off by the same authority, together with £4,612 accumulated interest to 30th June, 1899; but £1,200 interest has accumulated from that date to 30th June, 1904. The works at Dookie may be regarded as still valuable, as they are the means of supplying the college with water. The Emu Valley and Harcourt works have been transferred, but the money spent on the last five of the above trusts, amounting to £21,770, seems to have been entirely wasted.

Waterworks under control of municipalities and trusts.

The chief reservoirs under the control of municipalities are those at Ballarat (now under the Ballarat Commission), having an aggregate capacity of nearly 842 million gallons, the Gong Gong Reservoir alone containing 427 million gallons: the Beechworth Reservoir, at Lake Kerferd, containing 191 million gallons; the Clunes, at Newlyn, 225 million gallons; and the Talbot, at Evansford, 200 million gallons. The following return contains particulars of these waterworks:—

PARTICULARS OF WATERWORKS CONTROLLED BY TRUSTS AND CORPORATIONS.

Under what Control.	No. of Municipalities and Trusts.	Amounts of Loans and Grants Advanced to 30th June, 1904.	Principal as Reduced by Payments to Redemption to 30th June, 1904, and Amounts Written off.
		£	£
Municipal Corporations ..	27	675,161	436,182
Water Trusts	73	1,051,424	841,050
Total	100	1,726,585	1,277,232

The above figures do not include interest capitalized, £50,503—£6,870 for trusts and £43,633 for corporations.

The number of trusts and corporations controlling waterworks (exclusive of those controlled by the Government, the Metropolitan Board, and those on goldfields) was 100 on 30th June, 1904. The amount advanced was £1,726,585, of which £72,219 was by way of grant, the balance being advances on loan. The capital was reduced by £449,353 written off and paid to redemption, leaving a balance of £1,205,013, to which has to be added £50,503 for interest capitalized, making the capital indebtedness on the date specified, £1,255,516.

Melbourne Waterworks.

The waterworks for the service of Melbourne and suburbs were originally constructed by the General Government. The cost to 31st December, 1904, was £3,753,024. At the present time, these works consist of nine storage reservoirs, as under:—

Situation.	Storage Capacity in gallons.	Situation.	Storage Capacity in gallons.
Yan Yean	6,400,000,000	Caulfield	10,000,000
Toorourrong ...	60,000,000	Kew	3,000,000
Preston	16,000,000	Surrey Hills	9,000,000
Essendon, No. 1 ...	1,000,000	Morang (Pipe Head) ...	3,000,000
,, No. 2 ...	6,000,000		
		Total	6,508,000,000

The transfer of these works to the control of the Melbourne and Metropolitan Board was made in 1891. The Board consists of 40 members, one of whom is a Chairman elected every four years by the other members, the retiring Chairman being eligible for re-election. Seven of the members are electd by the Melbourne City Council, four by the South Melbourne, three by the Prahran, two each by the Fitzroy, Richmond, St. Kilda, and Collingwood, and one each by the other suburban municipal councils. In 1891, the rateable property within the area to be served was valued at about £6,600,000, of which about £1,000,000 was for vacant land. The collapse of the land boom was followed by a heavy shrinkage in the value of rateable property. A partial recovery in values has taken place, and the total assessments, inclusive of vacant land, now reach £4,568,784. The main source of supply is the Yan Yean Reservoir, in which are stored the waters of the eastern branch of the Plenty River and Jack's Creek, from the southern slopes of the Great Dividing Range, and those of Wallaby and Silver Creeks, brought over the range in an aqueduct from the northern slopes. These streams are collected in the Toorourrong Reservoir, and taken thence in a pitched channel to the Yan Yean Reservoir. A second supply is brought to Melbourne by means of the Maroondah Aqueduct, which conveys water from the Maroondah River, the Graceburn, and Donnelly's Creek, but without, at present, any provision for storing the surplus winter waters thereof, except the small service reservoirs in the suburbs at Preston, Essendon, Caulfield, and Kew. By means of these systems, Melbourne is provided with an ample supply of pure water at a high pressure. The total catchment areas for both systems aggregate 62,000 acres, the whole of which is under the control of the Board, and free from settlement

or grazing. The Yan Yean is an artificial lake situated 22 miles from the city, 602 feet above sea level. It covers an area of 1,300 acres, or rather more than two square miles, and receives water from a catchment area of 35,000 acres. The length of aqueduct and mains laid up to 31st December, 1904, was 262 miles, and of reticulation pipes (under 12-inch diameter), 965 miles, or a total length of aqueduct, mains, and pipes, of 1,227 miles. The storage capacity of the main reservoir is 6,400 million gallons, and of the eight subsidiary reservoirs 108 million gallons. The population supplied with water is about 500,000, and the average daily consumption 59 gallons per head in 1904.

DAILY AVERAGE CONSUMPTION OF WATER IN MELBOURNE AND SUBURBS, 1904.

Month.	Gallons.
January	32,714,000
February	31,708,000
March	31,381,000
April	30,438,000
May	27,492,000
June	24,437,000
July	24,387,000
August	25,752,000
September	24,479,000
October	27,659,000
November	34,127,000
December	39,696,000
Mean for the year ...	29,522,000

Sewerage system.

Connected with the water service of Melbourne and suburbs, the Board also controls the sewage system of the metropolis. The particulars of the system are as follow:—The whole of the sewage of the metropolis is being gradually collected by means of two principal main sewers leading to the pumping station at Spottiswoode. On the 31st December, 1904, the sewerage system, including mains, branches, and reticulation, had been laid over the following districts, viz.:—Port Melbourne, South Melbourne, Melbourne proper, Richmond, the greater part of Prahran and St. Kilda, the populated part of Malvern, a large portion of Hawthorn, Collingwood, Fitzroy, Caulfield, and Kew, together with nearly the whole of Footscray, Flemington, Kensington, and North Melbourne. In all, 629 miles of reticulation, and 68⅔ miles of main and branch sewers have been completed, the system being so advanced that the sewage from 74,859 houses could be collected, including nine houses in Brunswick. Of these, 68,361 have been actually connected, embracing altogether 10 public conveniences, 36 public urinals, 75,553 water closets, 137 latrines, 5,335 urinals, 754 slop-hoppers, 49,480 baths, 14,143 lavatories, 36,764 sinks, 27,558 sets of wash-troughs, 6,223 stables, 87 dairies, 1,068 polluted areas, and 1,288 cellars. There are also

921 3-5 miles of house connexions laid (916 1-5 miles of vitrified stoneware pipes, and 5 2-5 miles of cast-iron pipes), or a grand total of 1,619 4-15 miles of work done. The whole of the sewage when collected at Spottiswoode is raised about 125 feet, to the head of the outfall sewer, through $2\frac{3}{4}$ miles of wrought-iron rising main, whence it gravitates to the farm in a partly open and partly closed channel 11 feet in diameter, at a grade of 2 feet to the mile. It is then spread over properly prepared areas of land by a series of main and lateral carriers. The effluent, after filtering through the prepared areas, is discharged into Port Phillip Bay in a perfectly clear and transparent condition. The prepared blocks are laid down with prairie grass and lucerne, on 1,700 acres of which, during the financial year ending 30th June, 1904, 30,330 sheep have been fattened and sold. During the same year the Board were grazing 464 bullocks on 345 acres, while on 400 acres, cattle and horses have been placed for agistment. The profit on sheep for the same period amounted to £9,421. Of the whole farm area of 8,847 acres, there remain 2,450 acres, comprising land in the course of preparation, plantations, roads, and drains; and 3,952 acres, not used in connexion with sewage distribution, but let on lease to farmers at an average rental of 16s. 5·09d. per acre.

Goldfields reservoirs.

There are 21 goldfields reservoirs, having an aggregate capacity of 531 million gallons—the largest, at Back Creek, Creswick, containing 135 million gallons. These cost £55,860 to the 30th June, 1904, and were originally constructed by the Government chiefly for mining purposes, though some are now used solely for domestic purposes. Full particulars respecting each reservoir appear in the following table:—

RETURN OF RESERVOIRS CONSTRUCTED ON GOLD-FIELDS.

Showing the names of their Controlling Bodies, Names, Storage Capacity of Reservoirs, Purposes for which Provided, and Cost to the 30th June, 1904.

Under what Control.	Name of Reservoir.	Capacity.	Purpose.	Cost.
		Gallons.		£
Shire Council of Ripon	Beaufort ..	85,881,000	Mining	1,991
Shire Council of Ballan	Blackwood ..	38,000,000	Mining	1,090
Borough of Dunolly ..	Dunolly (old) ..	17,200,000	Mining	1,912
Borough of Daylesford	Hepburn ..	31,284,000	Mining	2,527
Shire of Avoca ..	Homebush ..	5,000,000	Mining	328
Borough of Inglewood	Inglewood (old)	5,670,000	Mining	1,112
Borough of Inglewood	Inglewood (new)	22,000,000	Domestic	4,951
Shire of Kilmore Water-Works Trust	Kilmore ..	14,466,000	Domestic	2,986
Borough of Maryborough	Maryborough ..	21,000,000	Domestic	1,839
Borough of Stawell ..	No. 1 Quartz Reef	5,000,000	Mining	..
Shire of Stawell ..	No. 9, Four Posts	3,100,000	Mining	802

RETURN OF RESERVOIRS CONSTRUCTED ON GOLD-FIELDS—*continued.*

Under what Control.	Name of Reservoir.	Capacity.	Purpose.	Cost.
		Gallons.		
Shire of Tullaroop ..	Nuggety Gully ..	25,000,000	Domestic	2,384
Borough of Ararat ..	Oliver's Gully ..	24,000,000	Domestic	5,000
Shire of Avoca ..	Redbank ..	27,100,000	Mining	2,785
Borough of St. Arnaud	St. Arnaud ..	40,000,000	Domestic	15,343
Borough of Tarnagulla	Tarnagulla ..	8,000,000	Domestic	1,430
Shire of Korong ..	Wedderburn ..	12,000,000	Domestic	2,590
Government* ..	Back Creek ..	135,000,000	Mining	4,211
Government* ..	Gapsted ..	5,700,000	Mining	1,150
Government ..	Mafeking ..	400,000	Domestic	429
Creswick Shire* ..	Broomfield and Allendale	5,000,000	Domestic	1,000
	Total ..	530,801,000	..	55,860

Proposed Legislation for Irrigation.

For many years past Governments of the State have recognised the importance of irrigation, and under the provisions of the various Water Supply Acts that have been passed, arrangements have been made for the conservation and supply of water, and its conveyance to areas suitable for irrigation. A Bill to consolidate and amend these laws was introduced into the Legislative Assembly by the Minister of Water Supply on 17th September, 1904, by means of which it was proposed to secure for the water service of the State one management, with one system and one policy, by the appointment of a Board of three "State Rivers and Water Supply" Commissioners, in whom, existing trusts being abolished, all State water-works should vest. The Crown also was to resume possession of the natural waters of the State, and of beds and banks of creeks, rivers, lakes, &c. All existing water rights were to be submitted, so that they might be inquired into, and registered or disallowed. It would also be the duty of the Commission to encourage irrigation in every possible way; while the apportionment of definite water rights would give the necessary security to the cultivators. No irrigation charges would be made in respect of any lands until the works were so far completed as to render a supply of water available for the irrigation thereof. The completion of the whole scheme would take several years, not less than six or seven; but the construction of the distributary channels would proceed simultaneously with the main channels; and thus the area supplied would be extended year by year until the whole was overtaken. After considerable discussion, the Bill was passed through all its stages in the House of Assembly, but in the Council, owing to the lateness of its introduction, and in order to give Councillors opportunity to more carefully study its provisions, it was postponed till next session, arrangements being made, however, that it should be taken up at the precise stage where it was dropped.

* Constructed under *Mining Development Act* 1896.

MILDURA IRRIGATION SCHEME.

History of the Settlement.

Inception of the scheme.

A Royal Commission was appointed in December, 1884, to consider the best means of conserving water in Victoria for irrigation, and for other purposes. The Hon. Alfred Deakin, then Minister of Public Works and Water Supply, was appointed President; and, in due course, he visited California and elsewhere, concerning which glowing accounts had been received as to the success achieved by intense culture on small holdings, with the aid of irrigation. Among the settlements inspected by Mr. Deakin were those of Riverside and Ontario, the latter of which had been often cited as an example for Victoria to imitate in the establishment of irrigation colonies under private enterprise. He there met one of the Messrs. Chaffey, who had been identified with that settlement from its commencement. In September, 1885, an advance agent visited Victoria on behalf of the Messrs. Chaffey, in regard to obtaining a concession of land suitable for irrigation purposes and the establishment of irrigation colonies. In February, 1886, Mr. Geo. Chaffey arrived in Victoria, and after some months of inspection, Mildura was chosen as the site for the proposed irrigation settlement. The first proposal by Messrs. Chaffey's representative was for a grant of 500,000 acres free, and a subsidy of £200,000. This was not entertained; and an agreement was then submitted by which the promoters were to acquire 250,000 acres at Mildura under certain conditions. The agreement was placed before Parliament, and, after a long debate, in the course of which the scheme was adversely criticised by many members, it was decided to throw the concession open to competition by public tender. Tenders were invited, and, as there was no other tender, the proposal of Messrs. Chaffey was accepted.

Chaffey Brothers concession.

Under the terms of the indenture of 31st May, 1887, made between the Government and George Chaffey and William Benjamin Chaffey, of Toronto, in Canada, but then resident in Melbourne, it was agreed that 250,000 acres be set apart for the settlement at Mildura. Messrs. Chaffey were licensed to enter upon and occupy two blocks of about 25,000 acres each, contiguous to the River Murray, which blocks had about half of the total frontage to the river, to hold the same for 20 years, subject to the usual conditions for resumption, on payment of compensation, of any portion required for public works, and subject to usual conditions as to the entry for mining. The licensees were were to be entitled to a grant in fee simple of one acre for every £5 of expenditure on the 50,000 acres in irrigation works and substantial improvements; but an expenditure of £2 per acre was to be deemed sufficient in respect of any of these lands subject to flooding. After three years, the licensees would be entitled to occupy for 20 years the remaining block of 200,000 acres, or part thereof, and grants in fee simple were to issue in respect of any of these lands, subject to an expenditure on improvements thereon to the extent of £1 per acre, and of payment to the Treasury of a further £1 per acre. Every grant in fee simple should contain a condition

that the licensees should not sell or dispose of any part of the 250,000 acres, except in parcels of not more than 80 acres for fruit growing, or 160 acres for growing other products, and not more than one block to one person; and that every parcel should have a sufficient water-right to run with the title as a perpetual easement; and it was provided that the licensees should not retain themselves more than 5,000 acres of cultivated and irrigated land out of that granted to them in fee simple. A licence to divert water from the Murray sufficient for the purposes of the settlement was granted for 25 years, renewable for successive periods of 25 years.

In consideration of the concession, and the foregoing benefits, the licensees covenanted to expend £300,000 in irrigation works, in accordance with general plans approved by the Government, within twenty years, as follows:—In the first five years, £35,000 (£10,00 in the first year); in the second five years, £140,000; in the third five years, £75,000; in the fourth five years, £50,000. Covenants were also made by the licensees, *inter alia*, to have all engines and machinery made in Victoria, except such as may be necessary for patterns; to destroy all vermin; to provide bridges over channels; to make and maintain roads; to establish within five years works for fruit-drying, preserving, and canning, and to carry on the business during the licence; to set apart one-fifteenth of all irrigated land, in detached blocks, for an agricultural college, and to build such college as soon as 100 families should be resident. It was also provided that in the event of any breach of covenants, the Government might call on the licensees to show cause why it should be permitted, or require the breach rectified. If no sufficient cause were shown, or if the breach were not remedied, the Government might remedy same at the cost of the parties; or if the breach were deemed sufficiently serious, might determine the licence and resume the licensed lands, except such as were sold for valuable consideration, or conveyed in trust for the agricultural college.

Formation of company.

On 30th September, 1887, the Chaffey Brothers Limited Company was formed, to which was assigned all the Messrs. Chaffey's interests and rights in the agreement with the Government. In December of the same year, the Mildura Irrigation Company was formed, in order to provide some expedient for securing the water right as a perpetual easement to purchasers of land, the law recognising no property in running water; this easement to be thereafter inseparable from each block sold.

Advertising of Scheme.

Agents were then appointed by the promoters in almost every city or town of note in the United Kingdom, and the lavish system of advertising induced many settlers to emigrate and invest their capital in Mildura. The class of settlers who were attracted to the settlement was of the very best. A large number were British, and there were also a number attracted from America, Germany, and the other Australian States; whilst there were also a considerable number of Victorians, most of whom were the sons of well-to-do citizens.

Complaints by the settlers.

Brief official and semi-official visits were from time to time made by successive Ministers of Water Supply and officers of the Department. None of these visits involved detailed examinations of the machinery

employed for lifting the water from the river, or of the channels constructed for its conveyance and distribution to the lands of the settlers; but were directed rather to learning the extent and character of the settlement, the products grown, the facilities for disposing of them, and the prospects of the settlement proving permanent. About the middle of 1892, complaints began to be made by the settlers of the non-performance of the covenants of the agreement on the part of the licensees, and continued to be very persistently urged by a section of the resident land owners, until the relations became so strained, that the most serious consequences seemed possible. The principal complaints made were:—That the pumping plant was unequal to the duty of raising water for the irrigation of 40,000 acres; that the machinery was badly designed and imperfectly constructed, and the boilers of an obsolete type; that the plant and machinery were not manufactured in the colony, as provided by the indenture, and that payment of the duty on it had been evaded; that the plant had not been legally conveyed to the Mildura Company, nor to any other body representative of the settlers, and that it was liable to seizure by the creditors of Chaffey Bros. Limited; that the channels were so badly constructed that a large proportion of water was lost by leakage, thus rendering barren large areas purchased by the settlers; that the channels had been carried through considerable areas of land which contribute nothing to the rates, thus increasing the rates levied on the settlers; that the Billabong dam had been imperfectly constructed; that the agricultural college had not been established, although more than 100 families had for some time been resident; that the lands set apart for the college were inferior; that the licensees had not established fruit canneries and preserving works; that purchasers were led to believe the water rate would be no more than 6s. per acre per annum, whereas it was then 20s. per acre per annum. There were also several other matters of complaint.

Report by the Chief Engineer of Water Supply.

In compliance with a request made by the Minister in March, 1893, Mr Stuart Murray, the Chief Engineer of Water Supply, visited Mildura, to inquire into the complaints of the settlers, and to inquire into the state of affairs generally. In his report, dated 1st August of the same year, it is stated that the total expenditure to date exceeded the amount the licensees were required to incur under the indenture; that the licensees had obtained grants in the fee simple to the extent of 50,195 acres, of which about 10,000 acres had then been planted; that of this 50,195 acres, 15,831 had been sold, 1,338 acres were reserved for college, 185 leased, 450 provisionally sold, 350 acres reserved by licensees, and the balance was still held by licensees; that the existing plant when complete would be equal to a much higher duty than the supply for irrigation of 26,020 acres commanded, or even of 40,000 acres previously mentioned, and that the full normal duty of the plant was sufficient for 76,800 acres; that the channels were not maintained in good order, and the banks were overgrown with weeds extending below the waterline, so as to interfere with the flow of water and reducing the volume of discharge; that the loss of water by percolation was undoubtedly great; that the soakage renders the soil in places affected so saturated that plants

cannot thrive or live; that the rates levied for water were much higher than was stated in the earlier advertisements, and were higher than would, under favorable conditions of working, be warrantable; that, in regard to the allegation that the plant has not been legally conveyed to the Mildura Company for the settlers, the only conclusion that can be arrived at is that it was still in the possession and under the control of the firm; that the lands set apart as an endowment for the college were of inferior quality; that the Billabong dam had been roughly built, but could be made a thoroughly sound work for a trifling sum, probably under £150.

Establishment of irrigation trust.

In December, 1895, an Act was passed establishing the First Mildura Irrigation Trust, consisting of six Commissioners and two Auditors, to be elected by the occupiers and owners of rateable land. The land upon which the irrigation works are erected, and all approaches and works, are vested in the trust. The promoters were to put all works in a state of efficiency by 1st January, 1899—that is, to be capable of raising, conveying, and distributing the maximum quantity which they would under the concession, be entitled to take and divert from the acreage now administered by the trust, and that not more than one-fifth of the water shall be lost in conveyance and distribution. The word "promoters" includes the successors or persons in ownership or control of the rights, privileges, and licences contained in the original indenture, either by purchase or by operation of law, but does not include any mortgagee or purchaser from a mortgagee. If the Chief Engineer reports that reasonable progress is not being made, the trust may have same done, and recover the costs and expenses from the promoters. No rates shall be struck by the trust to exceed £1 per acre, except by resolution of two-thirds of the ratepayers, voting at a general meeting. All land in the irrigation area shall carry with it a sufficient water right as a perpetual easement, and the trust is entitled to take and divert from the Murray the quantity of water the promoters could take for the area. Any other district, forming part of the irrigation area, may be constituted under a trust. The rights of the promoters are preserved, subject to the provisions of the Act.

The Royal Commission in 1896.

In May, 1896, a Royal Commission was appointed, under the presidency of the Hon. A. L. Tucker, M.L.A., to inquire into and report upon the condition and prospects of the Mildura settlement. Without any delay, the Commission proceeded to Mildura, inspected the machinery and apparatus, and examined 54 witnesses. The Commission issued its report in September of the same year, from which it appears that foremost amongst the causes of failure were the grave errors made in laying out the settlement, and in making provision for the supply of water for irrigation. The second was the non-fulfilment of the obligations undertaken in the agreement, whereby the reasonable expectations of the settlers were disappointed; and thirdly the hopeless financial management of the company. The Commission was "forced to the conclusion, after the fullest inquiry, that the Messrs. Chaffey had but little means, and, indeed, the settlement may be said to have been initiated by persons who obtained the enormous concession of dealing with 500,000 acres of public territory in both colonies with capital practically amounting to nothing. We are

confirmed in that opinion by the fact that the company borrowed £10,000 during the first year, that being the amount required to be expended under the indenture."

The inefficient condition of the main channels was the principal drawback, and the evidence went to show that, on the average, fully 50 per cent. of the water pumped into the channels was lost through soakage. Other difficulties under which the settlers laboured were the inferiority of the quality of the fruit trees supplied in the first instance, and defective means of communication with the markets. The method of conveying produce to the market was by steamer up or down the Murray to the nearest railway station, the river being closed to navigation during a portion of the summer months.

The report goes on to state that the public failed to subscribe more than the very limited sum of £44,000, and the financial struggle to carry on the company must have been very great. Various methods were resorted to for the purpose of raising money, resulting always in the payment of large interest for accommodation, and finally in the financial wreck of the whole concern. The course adopted from the start was to rely mainly upon the money received from the sale of land to the settlers. The rapid success during the first few years, so far as the sale of land was concerned, led the company to quickly expend what resources it had, and to spread out the settlement in a very disadvantageous way, in the hope of rapidly disposing of the intervening country, which hope was not realized. One cause, which assisted in curtailing sales, was the agitation by the settlers to be supplied with water free of charge, as had been the rule up to 1890, and which they claimed to be entitled to under the terms of the indenture. The fall in prices of the produce was another serious factor.

Advances were obtained by the company from various financial institutions, which required heavy rates of interest and a wide margin of security amounting to three or four times the face value, the security being mortgages by settlers for future instalments of purchase money. In addition to capital raised by this means, £200,000 was borrowed in London by the issue of debentures. By a decision of the Supreme Court, the debenture-holders have been adjudged as now possessing all the unpledged assets of the company, and also the original concession; and are, consequently, now the representatives of the company, and have become the owners of all that belonged to the company at the time of its liquidation.

The Commission recommended that a loan be granted to the Mildura Irrigation Trust, not exceeding £30,000, with interest at 4 per cent. and a sinking fund of ½ per cent.; that the concession in the original indenture be cancelled to the extent of freeing 188,000 acres not disposed of, and reverting same to the Crown, that £5,000 of the loan be for the purpose of improving the pumping plant; and that a further advance of £400 per month be made to subsidize the work of distributing water. It was also urged that the Department of Agriculture should supply the want of an agricultural college by forming a small experimental station, and by appointing an expert to visit the settlement at cerain periods, to afford instruction and advice as

to the most advanced methods of dealing with fruit and its preservation and packing in the most attracive form for market.

Loans by Government to the trust.

To meet pressing necessities, an overdraft was guaranteed by the Treasurer, and, as recommended by the Commission, a loan was authorized to the extent of £34,700 to clear off the overdraft, and to improve, line, and consolidate the channels; and to add to the appliances for raising water for irrigation to improve any other portion of the works; and for doing any work which the Chief Engineer should declare to be necessary. In September, 1897, further assistance was granted by the Government, by increasing the loan by £10,000, and by providing for further annual loans not exceeding £2,000 in any one year, to make up for any deficit of expenditure over revenue of the trust. These future advances were conditional upon the debenture-holders and holders of mortgages contributing specified sums. Up to the 30th June, 1904, the total amount advanced was £58,700, which, together with interest accumulated to that date, £11,584, represents the total indebtedness of the trust to the Government.

Railway to Mildura.

In October, 1900, an Act was passed authorizing the construction of a railway, commencing at the terminus of the Birchip and Cronomby Railway, at or near Woomelang, and proceeding thence for about 124 miles north-westerly, and terminating at or near Yelta. The construction of the line was conditional on the Shire Council of Mildura entering into a bond for ten years from the opening for traffic to pay any deficiency on the cost of working the line, and 3½ per cent. interest on cost of construction and rolling-stock over and above the receipts. Such contribution is limited to a sum produced by a 1s. rate on all rateable property in the shire. It is provided that the expenditure on the construction of the line should not exceed £2,000 per mile. The line has been constructed, was opened for traffic towards the close of 1903, and the settlement is now on a fair way to prosperity.

Differential rating.

An Act was passed in April, 1903, extending the rating powers of the Irrigation Trust, raising the maximum rate leviable to £2 per acre, and providing for a differential maximum rate on the several classes of lands in the settlement, and for the rate and scale of charges when water is supplied by measure.

Future prospects of Mildura.

In a report on the position and prospects of irrigation in Victoria, published in the issue of this work for 1892, Vol. II., Appendix D., Mr. Stuart Murray, Chief Engineer of Water Supply states:—"The crucial test of competition in the open market, upon which hangs the ultimate success or failure of the undertaking, is yet to come. . . . The Mildura fruit-growers must look further than the Victorian, or even the Australian, market for the success of their industry." The same doubt appears to have been entertained by the Roval Commission in 1896, which, in its report, stated that the expenditure of the loan recommended would place Mildura upon such a footing as to be able to prove conclusively whether the permanent and profitable continuance of the settlement may be realized; that after the local demand of Victoria was fully supplied, the remaining produce of Mildura must be exported and meet competition in the world's market; that on the prospective success of so doing, there were many

and varied opinions; and that the high cost of the land and the expense of bringing it under culture is a most important factor in this connexion. The Commission was of opinion that, as the settlers had been attracted under the terms of the agreement beween the Government and Mesrs. Chaffey, which terms were not complied with by the latter, it behoved the Government to come to the aid of the settlers.

The Federation of the Australian Colonies has, however, resulted in opening up a wider protected market for home consumption, and the customs returns show that Victoria now exports to the other States, New Zealand, South Africa, and the United Kingdom, a considerable quantity of canned fruits, raisins, and dried fruits, most of which are the produce of Mildura. The following were the quantity and value of these exports during 1903:—

EXPORTS DURING 1903 OF CANNED AND DRIED FRUITS PRODUCED IN VICTORIA.

Country to which Exported.	Canned Fruit—Value.	Dried Fruits.			
		Raisins.		Other.	
		Quantity.	Value.	Quantity.	Value.
	£	lbs.	£	lbs.	£
Western Australia ..	13,225	57,861	1,022	4,319	145
Other Australian States	13,347	1,941,687	41,355	365,741	8,289
New Zealand ..	119	414,736	5,264	206	5
South Africa ..	1,129	5,132	60	..	..
United Kingdom ..	98	22,400	340	398	14
Other Countries ..	2,881	6,073	96	2,912	178
Total ..	30,799	2,447,889	48,137	373,576	8,631

It will be seen from this and the following table that Victoria is building up an export trade in canned and dried fruits, and that the exports are not confined to the local protected market. The following were the exports of these articles since 1895:—

EXPORTS OF CANNED AND DRIED FRUITS PRODUCED IN VICTORIA, 1895 TO 1903.

Year.	Canned Fruits.	Dried Fruits.	
		Raisins.	Other.
	£	£	£
1895	2,625	3,941	1,286
1896	3,904	835	1,777
1897	6,849	1,147	4,510
1898	5,823	7,388	6,674
1899	9,672	7,524	8,286
1900	20,396	10,150	5,121
1901	31,015	15,095	4,963
1902	30,223	23,730	20,519
1903	30,799	48,137	8,631

It will be seen from this table that, while the export of canned fruits in 1903 remained about the same as in 1902, there was a large increase in that of raisins. The quantity of other dried fruits exported was somewhat above the average, but greatly below the quantity of 1902.

Mildura has risen superior to difficulties which a few years ago appeared almost insurmountable—difficulties caused by adventurous speculation, bad management, fall in prices, and ignorance of methods and products most suitable for growth. The errors of the past are now being retrieved, and the latest reports are of the most sanguine description, it being stated that healthy progress is visible everywhere, and that the conditions of soil, climate, and water supply are being thoroughly mastered by practical experience. The grit, energy, and enterprise displayed have been remarkable. The products which have been found to give most payable results are raisins, currants, dried apricots and peaches.

The following figures, showing the population of the settlement since 1891, are a fair indication of its recovery:—

POPULATION OF MILDURA, 1891 TO 1904.

1891	Census	...	2,321	1897	September	...	2,500
1891	September	...	3,000	1898	,,	...	2,800
1892	,,	...	3,500	1899	,,	...	3,020
1893	,,	...	3,000	1901	Census	...	3,325
1894	,,	...	3,000	1902	September	...	3,625
1895	,,	...	3,000	1903	,,	...	4,050
1896	,,	...	2,000	1904	,,	...	4,100

The following is a statement of the revenue and expenditure of the Irrigation Trust during the year ended 30th June, 1904:— Revenue and expenditure of Mildura Irrigation Trust.

REVENUE AND EXPENDITURE OF THE TRUST, 1903-4.

Revenue.	£	*Expenditure.*	£
Arrears, Horticultural Assessment	2,350	Expenditure on Pumping Stations	8,040
Current Rates, Horticultural Assessment	8,233	Expenditure on Town Supply	821
Arrears, Town Assessment	406	Distribution of Water	2,625
Current Rates, Town Assessment	466	Interest	2,347
Special Rate, 1902	76	Other Expenditure	887
Extra Rate, 1903	2,689		
Miscellaneous	272		
Total	14,672	Total	14,720

The following were the revenue from rates, &c., and the expenditure on pumping distribution and town service, during the last five years:—

Year.	Revenue.	Expenditure.
	£	£
1900	9,801	9,647
1901	10,756	9,987
1902	11,461	11,650
1903	13,738	13,842
1904	14,672	11,486

Fire Brigades.

Connected with the water service of the State generally, is the service of water required for fire extinction.

Under the *Fire Brigades Act* 1890, there are constituted a metropolitan fire district, controlled by the Meropolitan Fire Brigades Board, and nine country fire districts, controlled by the Country Fire Brigades Board. The supervisors are the chief officers of the respective boards, who are aided by deputies and other assistants.

The arrangements for fire extinction in the metropolis are closely allied to those for the Melbourne water supply, the service having been provided under the clauses of the *Fire Brigade Act* 1890, and its amendments.

The metropolitan fire district embraces the area included in the various municipalities within a radius of ten miles from the General Post Office. The area vested in the Metropolitan Board of Works is included in this area, but the Metropolitan Fire Brigades Board has jurisdiction over portions of the shire of Wyndham, Braybrook, Keilor, Broadmeadows, Darebin, Whittlesea, Heidelberg, Templestowe, Nunawading, Mulgrave and Moorabbin within the ten-mile radius, not vested in the Metropolitan Board of Works.

The Metropolitan Fire Board is controlled by three members appointed by the Governor in Council, three by the municipal councils, and three by the insurance companies.

The Country Board, like that of the metropolis, consists of nine members—three of whom are appointed by the Governor in Council, two by the municipal councils, two by the insurance companies, and two by the fire brigades in the country districts. Under the supervision of this Board, local committees supervise the working of the Act. These consist of three members—a chairman, elected by the municipal councils, and one member each, elected by the fire brigades and the insurance companies; if there are no fire brigades in the municipal districts, the Governor in Council appoints the member.

For the purpose of extinguishing any fire, the chief officers of the fire brigades may in the areas under their respective control "cause water to be shut off from any main or pipe in order to obtain a greater pressure and supply of water for the purpose of extinguishing any fire, and no persons or body having the management of any water supply shall be liable to any penalty or claim by reason of any interruption of the supply of water occasioned by compliance with the provisions of this section."

Another section provides that "each board, its officers, and servants, any local committee, its officers and servants, and any brigade registered under this Act shall have the use of any water mains, water plugs, valves, pipes, vested in or belonging to the Board of Land and Works, or any public or municipal corporation, or local body whatsoever, and of all water therein, or in any well or tank, free of charge, for the purpose of extinguishing any fire, or for the purpose of drills, competitions, and practice, conducted under the authority of either board or any local committee."

Local councils have the right, in the interests of fire prevention with the approval of the Governor in Council, of making, altering,

or repealing by-laws for the purpose of regulating the height of all buildings erected in their own municipality, or in any part of it, and also for providing means of escape from such buildings during a fire.

The general duties of the Fire Brigades Boards are defined to be those "of taking, superintending, and enforcing all necessary steps for the extinguishment of fires, and for the protection of life and property in case of fire, and the general control of all stations and of all fire brigades shall be vested in the boards for the metropolis and country districts respectively. The boards may purchase or lease property for fire brigade stations, and control the formation of permanent and volunteer fire brigades, and schools of instruction, the maintenance of fire alarms, and the establishment of communication, telephonic, and other."

The Metropolitan Board of Works under the *Water Act* 1890 must, upon the request of any municipal council within its boundaries, fix proper fire plugs, in the main and other pipes belonging to the board at convenient distances, and at such places as the board may consider proper and convenient for the supply of water for extinguishing any fire which may break out within its limits. The cost of fixing fire plugs and notice boards, together with their maintenance, must be defrayed by the municipal council within whose limits the fire plug is fixed. The board may also fix fire plugs for private owners, provided they pay the cost and maintenance.

The Metropolitan Board of Works is bound to keep all its pipes, to which fire plugs are affixed, charged with water, unless prevented by unusual drought or other unavoidable cause, or during necessary repairs, and shall allow all persons at all times to take and use such water for extinguishing fires. On 31st December, 1903, it had fixed 425 pillar hydrants, 13,285 ball fire plugs, 157 "Tregear" hydrants, to its 950 miles 65 chains of reticulation mains, and except in case of accident, repairs, or cleansing, these mains are kept constantly full of water under pressure. The Metropolitan Fire Brigades Board on the same date had under its control the following:—45 stations, 147 permanent men (of all ranks), 6 men at theatres, 150 auxiliary firemen, 9 steam fire engines, 3 manual engines, 35 horse hose reels, 60 hand hose reels, 10 extension ladders and fire escapes, 12 exercise and supply carts, 2 salvage vans, 1 brake, 1 motor car, 58 horses, 84,022 feet of hose, 36 hand pumps, 2 smoke helmets and jackets, 112 telephones in stations, 103 fire alarm circuits, having 158 fire alarm points, and 345 fire alarm and telephone points. The total length of wire in use outside the stations for fire alarms and telephones being about 276 miles.

During 1903, the State contributed towards the maintenance of this board £12,700, the insurance companies £12,658, being equal to £4 11s. 6d. for every £100 of premiums paid on insured property, and the local municipalities £12,793, or 67d. in the £1 over an area wherein the property is valued at £4,571,777.

The Country Fire Brigades Board exercises control over 94 brigades, and had at the end of 1904 a roll of 1,942 members. There were 592 fires and alarms during the year. Most of the country towns are now provided with brigades, but in a great many the supply of water for fire extinction purposes during the summer months is a source of trouble and anxiety to the firemen. These brigades are gradually being provided with up-to-date fire stations. There were 41 fire insurance companies included within the operation of the Act, from whom £3,659 was received. The 84 municipal councils within the sphere of influence of the board contributed £3,715, and £3,636 was received from the State Treasurer, besides which amounts there was £10 general receipts. The total revenue was £11,020, the expenditure £10,185.

Rainfall Table.

The following table shows the average yearly amount of rainfall in each of the 26 basins or regions constituting the State of Victoria, from 1893 to 1904, and the rainfall during 1903 and 1904:—

Name of Basin.	Rainfall.		
	Yearly Average, 1893 to 1904.	During 1903.	During 1904.
	Inches.	Inches.	Inches.
Glenelg and Wannon Rivers ..	28·49	31·46	24·27
Fitzroy, Eumerella, and Merrie Rivers	31·03	33·01	27·02
Hopkins River and Mt. Emu Creek	26·65	31·63	26·22
Mt. Elephant and Lake Corangamite	25·17	28·78	26·85
Otway Forest	40·52	42·11	37·69
Moorabool and Barwon Rivers ..	26·80	28·82	25·99
Werribee and Saltwater Rivers ..	27·26	29·66	23·17
Yarra River and Dandenong Creek	34·86	39·95	40·92
Koo-wee-rup Swamp	36·28	38·03	37·64
South Gippsland	40·35	38·79	35·81
Latrobe and Thompson Rivers ..	38·45	35·33	35·40
Macallister and Avon Rivers ..	27·03	20·04	17·45
Mitchell River	30·88	25·22	22·09
Tambo and Nicholson Rivers ..	30·23	25·86	21·29
Snowy River	37·08	34·20	31·17
Murray River	24·94	21·76	20·54
Mitta Mitta and Kiewa Rivers ..	36·27	34·36	35·70
Ovens River	44·14	34·89	36·65
Goulburn River	28·02	28·93	26·36
Campaspe River	26·72	28·83	25·37
Loddon River	20·39	24·93	18·30
Avon and Richardson Rivers ..	17·20	22·55	14·77
Avoca River	19·40	23·45	15·22
Western Wimmera	21·91	21·64	17·45
Eastern Wimmera	24·55	27·05	20·16
Mallee Country	16·01	18·01	12·17
Weighted Averages ..	26·68	27·36	23·28

TABLE SHOWING AVERAGED AMOUNT OF RAINFALL.

In each of the 26 basins or regions constituting the State of Victoria, for each quarter, and for the whole year, with corresponding quarterly and yearly averages, for each basin, deduced from all available records to date:—

Name of Basin.	First Quarter.		Second Quarter.		Third Quarter.		Fourth Quarter.		Total Amount for the Year 1904.	Yearly Average.
	Total for 1st Quarter.	Average for 1st Quarter.	Total for 2nd Quarter.	Average for 2nd Quarter.	Total for 3rd Quarter.	Average for 3rd Quarter.	Total for 4th Quarter.	Average for 4th Quarter.		
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
Glenelg and Wannon Rivers..	4.82	3.38	7.07	8.68	7.35	9.97	5.03	6.46	24.27	28.49
Fitzroy, Eumerella, Merrie Rivers	5.63	3.78	8.29	9.63	8.23	10.81	4.87	6.81	27.02	31.03
Hopkins River and Mt. Emu Creek	6.64	3.71	7.31	8.08	7.24	8.09	5.03	6.77	26.22	26.65
Mt. Elephant and Lake Corangamite	8.01	3.79	6.14	7.37	7.16	7.49	5.54	6.52	26.25	25.17
Otway Forest	9.69	4.75	9.66	12.56	11.62	14.02	6.72	9.19	37.69	40.52
Moorabool and Barwon Rivers	8.69	4.15	6.22	7.76	6.52	7.81	4.56	7.08	25.99	26.80
Werribee and Saltwater Rivers	8.84	4.79	5.65	7.70	4.99	7.35	3.69	7.42	23.17	27.26
Yarra River and Dandenong Creek	14.03	5.53	9.71	9.65	10.80	9.85	6.38	9.83	40.92	34.86
Koo-wee-rup Swamp ..	11.93	5.16	9.05	10.56	9.50	10.91	7.16	9.65	37.64	36.28
South Gippsland	9.99	6.03	8.11	11.83	9.84	12.24	7.87	10.25	35.81	40.35
Latrobe and Thomson Rivers	9.40	6.04	7.61	10.11	9.62	10.90	8.77	11.40	35.40	38.45
Macallister and Avon Rivers	7.32	5.95	2.47	6.68	4.24	6.06	3.42	8.34	17.45	27.03
Mitchell River	7.85	6.70	4.49	7.88	6.17	7.31	3.48	8.99	22.09	30.88
Tambo and Nicholson Rivers	6.82	6.16	5.09	7.75	5.73	8.21	3.65	8.11	21.29	30.23
Snowy River	8.88	7.76	7.56	9.88	10.55	9.07	4.18	10.37	31.17	37.08
Murray River	4.80	4.50	4.52	7.65	6.09	6.83	5.13	5.96	20.54	24.94
Mitta Mitta and Kiewa Rivers	7.01	6.15	9.06	11.19	11.32	10.38	8.31	8.55	35.70	36.27
Ovens River	5.09	6.73	9.97	13.33	12.54	13.66	9.05	10.42	36.65	44.14
Goulburn River	6.11	4.21	6.27	8.58	7.85	8.20	6.13	7.03	26.36	28.02
Campaspe River	7.08	4.03	6.41	8.36	7.33	7.78	4.55	6.55	25.37	26.72
Loddon River	4.52	3.06	5.03	6.54	5.33	5.46	3.42	5.33	18.30	20.39
Avon and Richardson Rivers	3.72	2.26	4.06	5.48	4.25	4.94	2.74	4.52	14.77	17.20
Avoca River	3.81	2.32	4.12	6.46	4.57	5.22	2.72	5.40	15.22	19.40
Western Wimmera ..	2.80	2.22	4.91	6.86	5.18	7.39	4.56	5.44	17.45	21.91
Eastern Wimmera	4.25	2.72	5.73	7.84	6.08	7.40	4.10	6.59	20.16	24.55
Mallee country	2.73	1.92	3.32	5.19	3.26	4.48	2.86	4.42	12.17	16.01
State	5.83	4.00	5.89	7.99	6.76	7.77	4.80	6.92	23.28	26.68

RAINFALL IN REGIONS, DURING EACH QUARTER, 1903 AND 1904.

Percentage above the average, + (plus); below the average, — (minus).

Regions.	First Quarter.		Second Quarter.		Third Quarter.		Fourth Quarter.		Year.	
	1903.	1904.	1903.	1904.	1903.	1904.	1903.	1904.	1903.	1904.
Western Districts	+58	+ 71	+ 5	—15	+ 6	—18	+4	—23	+12	— 6
Cape Otway Forest	+50	+104	+11	—23	—12	—17	—5	—27	+ 4	— 7
Counties surrounding Port Phillip Bay	+31	+122	+ 4	—14	—12	—12	+23	—36	+ 9	+ 2
South Gippsland	+24	+ 66	—11	—31	—10	—20	— 4	—23	— 4	—11
Basins of the Latrobe, Macallister, and Mitchell Rivers	—30	+ 31	—25	—41	— 1	—17	—13	—45	—16	—22
Basins of the Tambo and Snowy Rivers	—50	+ 13	— 8	—28	+ 8	— 6	—1	—58	—10	—22
All Northern Areas between the Ranges and the Murray, West of the Campaspe River	— 3	+ 17	*	—26	+38	— 4	+17	—14	+15	—10
All Northern Areas between the Ranges and the Murray, East of the Campaspe River	— 3	+ 51	—18	—29	— 4	—18	+ 5	—36	— 7	—18

*Very slightly *above* average.

AVERAGES AND EXTREMES OF CLIMATIC ELEMENTS FOR THE SEASONS AND FOR THE YEAR DEDUCED FROM ALL RECORDS OBTAINED IN PAST YEARS AT THE MELBOURNE OBSERVATORY.

Meteorological Elements.	Spring.	Summer.	Autumn.	Winter.	Year.
Averages.					
Mean pressure of air in inches	29·893	29·838	30·005	30·000	29·934
Monthly range of pressure of air—Inches	0·896	0·803	0·806	0·979	0·871
Mean temperature of air in shade—Fahr.	56·8	64·8	58·5	49·2	57·3
Mean daily range of temperature of air in shade—Fahr. ..	18·8	21·4	17·7	14·3	18·0
Mean percentage of humidity. Sat. = 100	70	65	73	79	72
Mean rainfall in inches ..	7·29	6·00	6·70	5·75	25·69
Mean number of days of rain ..	37	24	30	41	129
Mean amount of spontaneous evaporation in inches ..	10·07	17·10	7·60	3·72	38·49
Mean daily amount of cloudiness—Scale 0 to 10	6·0	5·3	5·9	6·4	5·9
	h. m.	h. m.	h. m.	h. m.	h. m.
Mean daily duration of sunshine	5 58	7 21	4 26	3 28	5 18
Mean total of hours of sunshine	549 h.	710 h.	427 h.	322 h.	2008
Percentage number of hours during which the wind blew from the various points of the compass: North ..	16·0	7·7	16·1	28·5	..
North-West	9·4	4·1	7·6	13·0	..
West ..	15·2	9·5	12·2	14·9	..
South-West	16·8	20·4	12·6	10·8	..
South ...	16·5	24·1	14·9	6·3	..
South-East	9·8	19·2	14·1	5·0	..
East ..	3·7	5·6	5·6	2·7	..
North-East	11·2	8·1	15·2	17·3	..
Calm ..	1·4	1·3	1·7	1·5	..
Mean number of days of fog ..	1·2	0·7	5·0	9·9	16·8

Extremes.

Pressure of air.	Inches.
Greatest monthly range ...	1·503
Smallest ,, ,, ...	0·489
Greatest yearly range ...	1·719
Smallest ,, ,, ...	1·169
Highest air pressure on record	30·678
Lowest ,, ,, ,,	28·868

Temperature of air in shade.	Fahr. °
Greatest monthly range ...	69·1
Smallest ,, ,, ...	23·4
Greatest yearly range ...	82·6
Smallest ,, ,, ...	66·0
Greatest mean daily range ...	27·8
Smallest ,, ,, ,, ...	7·7
Highest temperature on record	111·2
Lowest ,, ,,	27·0

	Fahr. °
Solar radiation—highest on record	178·5
Terrestrial radiation—lowest on record ..	20·4
	Inches.
Greatest rainfall on record	44·25
Smallest rainfall on record	15·61
Horizontal motion in miles	92,221
Mean hourly velocity of wind	10·5

Agricultural Educational Establishments.

An Act for the establishment of Agricultural Colleges was passed towards the close of 1884. Five areas were reserved as sites for colleges and experimental farms—at Dookie, Longerenong, Gunyah Gunyah, Olangolah, and Bullarto. Subsequently two further reservations were made—at Rutherglen and Edi. The total areas of these reserves amounts to 14,324 acres. Particulars are as follow:—

Areas of Agricultural College and Experimental Farm Lands, 1904.

Name.	Area.	How Used.
	A. R. P.	
Dookie and Currawa	4,889 0 0	College and Experimental Farm
Longerenong (Jung Jung) ...	2,386 0 0	Experimental Farm
Edi	18 3 25	Tobacco Farm
Rutherglen	913 0 24	Viticultural Station, Model Orchard, and Experimental Farm work
Gunyah Gunyah and Jumbuk ...	2,500 0 0	Not in use
Olangolah	2,800 0 0	Not in use
Bullarto	817 0 0	Let for grazing
Total	14,324 0 9	

Experimental farm, Dookie.

In order to carry out experiments, devised for the purpose of ascertaining the suitability of the Victorian climate and soil for various kinds of useful products and of obtaining data respecting the rotation of crops, but more especially for the instruction of students in agriculture, a block of 4,806 acres, subsequently increased by 40 acres, was reserved in 1874, at Dookie, situated in Moira, a county in the North-eastern district of Victoria, on which to found, under the direction of the Council of Agricultural Education, a State Experimental Farm. The following account of the present state of the farm has been furnished for this work by Mr. E. G. Duffus, Secretary for Agriculture:—

The farm has, under the provisions of the *Agricultural Colleges Act* 1884, been vested in trustees, and all moneys received from the sale of stock and produce since June, 1885, have been paid into the Agricultural College fund.

A new dairy has been erected, at a cost of £1,069, on the most scientific plans, and is fitted with a complete dairying plant of latest pattern, including a pasteurizer, refrigerator, &c.

A wine cellar and fermenting house has been erected at a cost of about £1,100, and students are instructed in the art of wine-making. There are in cellar about 10,000 gallons of wine, representing vintages from 1894 to 1903, and also 230 gallons of spirit made

from the by-products of the vintage; while during the same period 9,000 gallons of wine were disposed of. There are 32 acres under vines, consisting of 4 acres table grapes, planted in 1887; 5 acres Gordo, Blanco, and Zante currants, planted in 1888; 11 acres Red Hermitage, 7 acres planted in 1889 and 4 acres in 1895; 10 acres Carbenet, planted in 1894; 2 acres Baxter Sherry, planted in 1895; and 2½ acres of Red Hermitage, planted in 1903. There are 20 acres under fruit trees of all the approved varieties.

A new implement and grain shed, 174 feet long, is now being erected, and other improvements have been carried out. A new chemical and biological laboratory has been built. This is one of the best fitted up laboratories in the State, and gives ample opportunities for the scientific teaching.

During the year the rainfall recorded was 21·66 inches.

Considerable attention is paid to experimental work in connexion with the cereals. The rearing of new varieties of wheat, suitable for the different parts of this country, has special attention paid to it.

Manurial tests are carried out each year, and the results are published for the benefit of the farmers.

There is a good and growing demand for seed wheat, oats, and barley from the college farm; whilst, for the commercial training of the students, a good deal of grain is marketed. The threshing and the harvesting in general are carried out by the students under competent instructors. The cropping also is mainly carried out by the students, who are taught how to use the ploughs, cultivators, seed-drills, and all other farming implements.

Experiments with new fodder plants and with others of economic importance are carried out, whilst attention is also paid to the indigenous grasses. A variety of medicinal and other plants is also grown on the farm for educational purposes. There is a 4¾ acre plantation of fifteen-year-old olives, of six varieties.

Accommodation has been provided for 66 students, to whom the charge per head per annum is £25 for maintenance, £1 5s. for medical attendance and medicines, and £1 15s. for books and other school materials, or £28 in all. No charge is made for instruction.

Attention is being given to the breeding of draught horses and Indian remounts. Most of the horses used on the farm have been bred on it. There are several highly-bred Clydesdale mares, and a first-class stallion has been purchased by the Council of Agricultural Education, to be used for stud purposes on the farm and for approved mares of the farmers from the surrounding districts. The cattle on the farm include Ayrshires principally, also Herefords and Shorthorns. Farmers, on paying a small fee, may have the use of the stud bulls for their cows. The breeds of sheep kept are Lincolns, Merinoes, Hampshire Downs, and South Downs. The raising of early lambs

for the market occupies considerable attention. The pigs kept are pure Berkshires. There is a good demand for them for stud purposes. The poultry industry is fostered, and pens of the best breeds are kept. A very successful laying competition commenced on 1st May, 1904. Thirty-seven pens of fowls, of different breeds, entered for the competition, which ended on the 30th April, 1905.

Longerenong Experimental Farm.

The Longerenong Experimental Farm, under the control of the Council of Agricultural Education, is situated about seven and a half miles from the town of Horsham, and two miles from the Dooen railway station and post-office. It consists of 2,386 acres of land, fairly representative of the Wimmera district, with the exception of 700 acres of low-lying swampy land, which is only fit for grazing purposes, with a carrying capacity of about one sheep to every two acres. The balance is good wheat-growing land.

Experiments are being conducted in growing different varieties of wheat, oats, and fodder crops. Two hundred acres of wheat crop on the farm this year averaged 30 bushels per acre, and although the season was not so favorable for oats, 27 bushels per acre was obtained from 40 acres. There are also 30 acres of well-kept orchard, 5 acres of which are devoted to raising American phylloxera-resistant vines. There are also 35 acres laid down in lucerne, which can be irrigated, and provide excellent green fodder for stock during the summer months.

Water is obtained from the Western Wimmera Irrigation Trust, and is conveyed in open channels from the trust's pumping station at Dooen.

The stock consists of 18 draught horses, and a herd of Ayrshire cattle. Considerable attention is devoted to the raising of Shropshire sheep, and there is a flock of pure Shropshires from the best imported pedigreed sheep obtainable. A number of flock sheep, principally breeding ewes, is also kept.

Edi Tobacco Farm.

The Government Tobacco Experimental Station, containing 18 acres of land, is situated at Edi, in the North-eastern district of Victoria. It is used for the purpose of conducting experiments in the culture of the better classes of tobacco and their treatment, also for manuring experiments, which are intended to be an object-lesson to farmers generally, and aim at ascertaining the varieties of tobacco best suited to the soils and climate, and the manures best adapted for improving the quality of the leaf and producing the largest returns.

For the present year (1905), investigations in tobacco culture will continue along similar lines to those of the preceding year. The variety tests which might be considered the most important will be continued both at the Edi farm and in co-operation with growers. Experimental fields, including twelve varieties, have been established on eleven farms. The varieties in each field include the following:—Blue Pryor, Medley Pryor, Yellow Pryor, Kentucky Yellow, Bonanza,

Oronoco, Comstock Spanish, Connecticut Seed Leaf, Hyco, Hester, Conqueror, Bullion. In addition,, tests on the effect of closer planting in modifying the texture of the leaf will be carried out. The experiment of growing cigar-leaf under shade will be continued on a larger scale.

The analysis of soils carried out last year, indicates an abundance of the more important plant foods, and these results, together with the returns from the manure tests, suggest no immediate benefit to be derived from the application of fertilizers. The most valuable results from a practical point of view will probably follow the attempts which are being made by field experiment to determine the particular varieties of tobacco for which the soils and climate of the district might be specially adapted. Should the co-operative system of experimenting in this direction be found to be a promising one, its extension to other parts of the State will be recommended.

Experiments, to a small extent, are also carried out in connexion with wheat and forage crops.

Rutherglen Viticultural Station.

The chief work being done at the Viticultural Station is in connexion with the propagation and grafting of the American and Franco-American resistant vines for the reconstitution of phylloxerated vineyards.

As is well known, the ordinary European vines rapidly succumb to the attack of phylloxera—a tiny insect that injures the vine roots and quickly destroys vineyards wherever it has obtained a footing. Phylloxera was discovered in Victoria in 1877. By its inevitable spread it soon destroyed the vines in the districts to which it had been introduced. Other districts became infected. The seriousness of these attacks led to the trials of many methods to exterminate the pest, all of which have unfortunately proved futile. French investigators had discovered that certain American vines were able to resist the deadly action of the tiny but formidable phylloxera. These are used as stocks on which to graft the desired producing kinds, as their roots were able to withstand the attacks of the insidious insect foe.

There are a number of American vines known, but all are not equally suitable for all soils, nor adapted as graft-bearers for all European varieties, hence the work undertaken at the viticultural station is to discover the most eligible kinds. To test their adaptability to the different soils, sub-stations were founded in each viticultural district of the State, and data were carefully collected regarding the growth of each variety in the very diverse soils purposely selected for these tests. Only such as are of vigorous growth are recommended.

To ascertain the grafting affinities of each kind of stock and scion, some of each of the principal wine and table varieties were grafted on each kind of resisting stock. These were then planted out permanently and the results noted. Growers can readily see by this plot which stock suits a certain variety best. The grafting of those

European vines (of wine, table, and drying varieties that are in greatest demand) on suitable resistant stocks is carried out extensively during the season. The work is done both by hand and machines. A few rootlings are used as stocks, but the majority of the grafts are cuttings. A large number of the cuttings grown at the station are utilized in grafting chosen varieties for vignerons, who may not have facilities or time to carry out this operation for themselves. In addition, many thousands of American vine cuttings are supplied direct to the growers.

About 10 acres are planted out permanently at the viticultural station with "motherstocks" for the production of cuttings. These have grown so luxuriantly that fully half a million can be supplied during the ensuing season, and this number can be largely increased if necessary during the following year. There are also two nurseries of considerable area, each containing many thousands of healthy rootlings both grafted and ungrafted. To practically prove the efficacy of resistant stocks, grafted vines have been planted on the very sites of phylloxerated vines that had to be uprooted. These are growing luxuriantly, and afford striking testimony to their resistant value, as they are still surrounded by vines that are badly infected by the pest.

The principal resistant stocks grown belong to the genera Riparia and Rupestris, with their hybrids. As its name indicates, the Riparia in its native habitat loves moist, fertile soils along water-courses. Its root system is spreading and horizontal. Placed in such conditions as it is naturally accustomed to, it grows luxuriantly, but from the character of the root system, it is susceptible to drought. The species of Rupestris that are cultivated are more erect in habit than the Riparias, which are trailing. They are generally deeper rooted plants, and hence are better able to thrive in districts with a less generous rainfall. The Hybrids—usually designated by numbers—apparently inherit the good qualities of both parent plants, and have so far proved themselves most suitable for all conditions of soil and climate. They have also a wider range of affinity as graft bearers.

As a rule American vines do not take kindly to calcareous soils. The Berlandieri is one of the best for planting under such conditions, while for saline soils Solonis has so far proved itself most suitable.

Recently fourteen varieties, mostly new to Australia, of wine-making grapes have been imported. They are largely cultivated in South-eastern France, and will be grown and tested at the Viticultural Station with a view to proving their value as wine producers. The average yield of wine per acre in Victoria compares very unfavorably with that of Europe, and it is to be hoped that among this new importation varieties will be found which will increase the yield without diminishing the quality of the product. Two of the varieties are white grapes from the famous Sauterne vineyards, and are calculated to improve the quality of white table wines, which are becoming more and more popular every year. A further importation

is expected in time for the next grafting season, which will include varieties from the Duro Valley in Portugal, and the Sherry district of Spain. Already wines of a port and sherry type of very considerable merit are produced in Victoria, chiefly from French grapes. With the Portuguese and Spanish varieties about to be imported the quality of this class of wines should be improved out of all knowledge, and permanently enhance the reputation of Australian wines.

Wine-making is carried out at the station cellars, and about 2,500 gallons are being made this vintage. The treatment of wines, including pasteurization, receives considerable attention, and growers often visit in search of advice on this topic. A small still is utilized for the manufacture of spirit for fortifying sweet wines.

An excellent laboratory has been erected, and should permit of excellent work being done in the chemical analysis and bacteriological examination of wines.

In the vineyard attached to the station, interesting and useful experiments are being conducted in methods of pruning, cultivation, manuring, &c.

As a college for the sons of vine-growers the Viticultural Station never became popular. The buildings are now being filled with boys from the Neglected Children's Department, who are being trained in vine-growing and general farming, and will eventually become a means of supplying vine-growers with skilled labour of a class now difficult to obtain.

Experimental work is carried out with manures, cereals, grasses, fodder, and reputedly drought-resisting plants. A model orchard has been planted, and is worked under the supervision of the horticultural branch.

Experimental dairying and the cross-breeding of dairy strains of cattle has been started at the Viticultural Station, with a view to investigating the possibilities of dairying in the dryer districts of the State.

The station is open to inspection on all week days, and is well patronized by visitors anxious to learn.

Gunyah, Olangolah, and Bullarto.

These reserves have never been used for the purposes of colleges. The two former sites, containing 5,300 acres are not in use, and the latter, containing 817 acres, is now let for grazing.

Endowment lands.

In addition to the college and farm lands provision was made, by the Act of 1884, to permanently reserve from sale an area of not more than 150,000 acres of Crown lands, and to vest it in trustees to be appointed, who should hold it in trust for the benefit of and by way of an endowment for State agricultural colleges and experimental farms. The land so reserved now amounts to 144,294 acres,

and is described in the following table, but nothing appears to have been done with it beyond letting for grazing:—

ENDOWMENT AREAS.

Parish.	Acres.	Parish.	Acres.
Ararat	... 1,100	Leeor	... 125
Ardno	... 210	Moyston	... 242
Alexandra	 79	Moyston West ...	... 319
Bellellen and Illawarra	... 750	Mullroo and Yelta ...	... 28,600
Beveridge Island ...	... 2,732	Meering	... 690
Brankeet	... 387	Myrrhee	... 394
Berringama	... 199	Mooroopna	... 98
Bealiba	... 135	Milloo	... 120
Bumbang	... 10,000	Miran Piram ...	... 99
Byawatha	... 108	Moira	... 136
Buckrabanyule ...	... 220	Mologa	... 107
Bringalbart	... 79	Nurcoung	... 230
Bangerang	... 58	Pental Island ...	... 17,350
Broadwater	... 198	Pannoomilloo ...	... 100
Carraragarmungee ...	... 1,864	Peechember	... 50
Cudgewa	... 732	Purnim	... 3,678
Colac Colac	... 420	Quantong	... 495
Corack East	... 474	Quambatook ...	... 380
Charam	... 331	Turrumberry N. ...	... 615
Carchap	... 99	Tullich	... 400
Charlton East ...	... 228	Terrick Terrick East and West	160
Dropmore and Ruffy ...	... 454	Terrick Terrick E. ...	... 40
Dinyarrak	... 359	Tallandoon	... 116
Dartagook	... 120	Tarwin	... 167
Estcourt	... 2,831	Turrumberry ...	... 281
French Island ...	... 340	Tallygaroopna ...	... 430
Gooram Gong ...	... 582	Tragowel	... 250
Granya	... 586	Toolongrook ...	... 160
Gowangardi and Currawa	... 272	Wychitella	... 1,015
Glenpatrick	... 100	Walwa	... 200
Glynwylln	... 524	Windham	... 452
Jumbuk	... 2,641	Wabba	... 335
Kunat Kunat ...	... 700	Warrenbayne ...	... 145
Karramomus and Tamleugh	... 672	Wappan	... 293
Kerrisdale	... 148	Woorak	... 630
Kaarimba	... 429	Waratah	... 148
Knowsley	... 103	Wareek	... 100
Knowsley East ...	... 296	Warrenmang ...	... 120
Korrak Korrak . .	... 150	Wail	... 240
Kinypanial	... 80	Wonthaggi North ...	... 2,535
Koonik Koonik ...	... 37	Yarck	... 569
Konnepra	... 126	Yanac-a-Yanac ...	... 168
Kerang	... 90	Yeringa	... 160
Lindsay Island ...	... 42,000	Yeerung	... 1,400
Laen	... 887		
Longwood	... 242	Total ...	... 144,294
Lang Lang and Yallock	... 4,780		

The total annual rental for endowment areas was £7,180 6s. 9d.

SCHOOL OF HORTICULTURE.

The school is situated in the Richmond Park. The site covers 40 acres of ground, and was originally part of the old police paddock. In 1890 the Government decided to start on this site an institution for the training of orchardists and small settlers, and during the past

seven years much has been done to provide for teaching the regular and casual students, and those visitors calling in search of special information.

Effective roads and culverts have been laid, model orchard blocks, gardens, and a students' training ground have been prepared, and a large variety of instructive implementa got together for use in the class and field work.

Class room instruction is given in horticultural science, vegetable pathology, botany, physical and commercial geography, entomology, measuring, levelling, designing, and plotting of homesteads, orchards, and garden areas, and the most approved methods of raising and managing fruit trees and plants. Practical work includes the propagation and management of orchard trees, citrus, table grapes, bush fruits, harvesting, storing, packing, marketing, drying and canning fruit, vegetable culture, clearing, grading, and trenching of land, management of soils, manures, drainage, and villa gardening.

The principal and his assistant carry out this programme by affording lessons daily in the class room and field. Much of the landed estate has recently been placed in order to receive domestic and farm animals of all kinds, and these are now added, and form a helpful source of instruction to students.

In 1899, women students were first admitted, and up to the present year about 170 have passed through the institution. They have for the most part devoted their attention to the designing and making of villa gardens, vegetable and herb culture, and the special cultivation of table grapes and lemons—branches of commercial horticulture most suited to women.

Previous to 1903, instruction was free, but a fee of £5 per annum is now charged. There is a steady advance in the number of students, and every indication of the school doing generally helpful work in the service of the State. The flower gardens surrounding the principal's residence are noted for their beauty, and the instructional character of the work ever in progress makes the place well worth a visit at any season. The school year extends from February to December. Application for admission should be made to the Secretary for Agriculture, Public Offices, Melbourne.

AGRICULTURAL SOCIETIES.

There are altogether 93 agricultural societies in the State, receiving aid from the Government. During the year ended 30th June, 1904, the total of such aid amounted to £2,000, including £40 which was expended in the purchase of medals. Particulars respecting the most important of these societies are as follow:—

The Royal Agricultural Society.

In any account of the origin of the Royal Agricultural Society of Victoria, it is necessary to allude to the old Port Phillip Farmers' Society, as it was practically from the ashes of that institution that

the present society arose. The Port Phillip Society, after years of useful work, gradually became disintegrated, largely through internal dissensions, and was allowed to collapse. Then, as the result of a public meeting, in November, 1870, it was resolved—in the absence of any central society to promote the interests of producers—to form a new agricultural society on a wide basis, and this was accordingly done, the institution being called the National Agricultural Society of Victoria. In February, 1871, the foundation council was elected (with the Hon. W. Degraves as first president). The trustees of the old institution afterwards handed over their balance of funds and rights to a show ground site to the new society. With some fluctuations during its progress, this society—now the Royal Agricultural Society of Victoria, having had its title altered in 1890—has grown to be the most important agricultural institution in Australasia. Its objects are to promote the development of the agricultural, pastoral, and industrial resources of the State in the manner following:—

(1) By holding exhibitions at such places and times as the council shall appoint; and by offering and awarding prizes and premiums at all such exhibitions, if deemed desirable.

(2) By holding meetings at such places and times as the council shall appoint, at which meetings papers may be read and discussed.

(3) By collecting such information from agricultural publications, scientific and other works, as may be useful in promoting the objects of the society.

(4) By corresponding with agricultural and other kindred societies at home and abroad, and collecting from such correspondence all information which, in the opinion of the council, may lead to practical benefit in the cultivation of the soil and breeding of stock, as well as in the prosecution of other important industries.

(5) By encouraging the attention of men of science to the discovery of better methods of cultivation, to the improvement of agricultural implements and machinery, the construction of farm buildings, the application of chemistry to the general purposes of agriculture, the destruction of insects injurious to vegetable life, and the eradication or utilization of weeds.

(6) By promoting the discovery and introduction of new varieties of cereals, vegetables, or grasses suitable to the climate, and capable of being cultivated with profit; and also the introduction of desirable kinds and varieties of live stock.

(7) By collecting information regarding the management of plantations, live-fences, and other subjects connected with rural improvement.

(8) By investigating the nature of diseases in animals or plants, and taking measures for the publication, at such times and periods as the council may appoint, of the information thus collected, together with all approved original essays sent in, lectures delivered, or papers read to the society; besides making provision for the establishment of a library and reading-room for the use of members.

(9) By remunerating any person, if thought fit—who shall ascertain by experiment how far such information may lead to useful results in practice—for any loss incurred by such experiments.

The society possesses the Crown grant of show grounds at Flemington, 30 acres in extent, together with 5 acres added by purchase, on which over £51,500 has been spent in permanent improvements.

This large sum has been derived from the general income of the society, excepting £3,000 provided by the Government as a recompense for all buildings and fencing on the site previously held on the St. Kilda road. At the beginning of last year the society was quite out of debt, but owing to recent heavy expenditure, principally incurred in altering the conformation of the grounds, and erecting new buildings, its present overdraft is over £7,000.

The annual exhibition, in the first week in September, is one of the most important public events of the year. Last year the prize money offered for competition amounted to over £2,600, and there were over 5,600 entries of exhibits of a very high standard of excellence. Every year the show is patronized by an increasingly large number of visitors, its importance being recognised and accentuated by the annual proclamation of a public holiday on the Thursday of show week.

The society has a membership roll of 1,438 subscribers, and a general income of over £8,000, its principal sources of revenue being gate money, entry fees, subscriptions, and donations. Its expenditure is mainly incurred in providing additional accommodation at the show grounds for the annually increasing number of exhibits, in prize money, and in working expenses in carrying out the objects of the society.

The institution is governed by a council of 36 members. Of these, three are trustees, who hold office continuously, the remaining 33 being elective members, of whom eleven, or one-third, retire each year, and are eligible for re-election. The society

occupies, on lease, commodious offices in the Equitable Building, Collins-street, with a reading-room and a good agricultural library.

Ballarat Agricultural and Pastoral Society.

This society was established in 1856, but it possesses no records of earlier date than 1861. It is managed by a council of not more than 75 members, consisting of the president of the society, three vice-presidents, one honorary treasurer, and 70 ordinary members of council, of whom ten form a quorum. No person is eligible for election as a member of the council unless he has been a subscriber for the previous year.

The objects of the society are the improvement and advancement of agricultural and pastoral pursuits, of implements and machinery incidental thereto, and of the breed of stock.

Ballarat, being the centre of the great merino district of the State, holds a special sheep show each year, in the month of August. Since 1876, when these special shows were first inaugurated, they have been most successful, the prizes awarded up to date having reached the amount of £11,424.

The agricultural show of the society is usually held each year in the month of November. It is amongst the most important in the Western District, and always attracts a large number of entries. The prize money awarded and paid from 1861 to 1903 inclusive was £30,840.

In 1877, the late Sir W. J. Clarke offered prizes amongst his tenants for the best managed farms within the Ballarat Shire. The prizes are now continued by his sons, Messrs. E. E. D. and W. L. R. Clarke, who give £70 per annum for the purpose. The money is divided in prizes of £20, £10, and £5; (1) for farms over 160 acres, and (2) for farms under 160 acres. The competitions create a large amount of interest amongst the tenants, and are partly the means of keeping their farms in deservedly high repute.

The total amount of prize money paid since 1861 is £55,697, awarded as follows:—Ploughing matches, £9,245; farm and garden produce, £1,877; agricultural shows, £30,840; sheep shows, £11,424; tenant farms, £2,028; reaper and binder trials, £283. A sum of £13,266 has been expended in improvements and repairs to the show yards, keeping them in first class order, and providing proper accommodation for all exhibits. On the 30th April, 1904, the society's debit bank balance, covering all liabilities, was £290. The total receipts for the year ended 30th April, 1904, was £1,827, and the expenditure £1,686.

Bendigo Agricultural and Horticultural Society.

This society was founded about 40 years ago. It is governed by a president and 33 members of committee, and holds a very important position amongst the kindred societies of the State. The shows are held on a portion of Rosalind Park, of which the society holds a permissive occupancy from the Bendigo City Council. The

position is central, being practically in the very heart of the city. The progress of the society of late years has been most marked, and buildings of a substantial character for the accommodation of exhibits and the public have been provided. In point of attendance and number of exhibits, the society holds a very high position.

Its annual spring show is held in the second week of October, and extends over three days, the average attendance being about 15,000 persons. About £1,100 in cash and trophy prizes are disbursed. It is practically free from debt, and has valuable assets in the form of buildings and freehold land.

The show room is 200 feet long by 48 feet wide, and in it dairy produce, flowers, fruits, and vegetables are exhibited. There are also capacious poultry and dog show rooms, capable of accommodating nearly 1,200 exhibits. The sheep pens provide for 150, and the pig pens for 70 entries. Horse and cattle stalls furnish the accommodation required. The two grandstands will seat about 2,000 visitors. The refreshment and luncheon rooms are permanent structures.

Kyneton Agricultural Association.

This association was informally established in September, 1856, by the holding of a ploughing match, when prizes amounting to £62 were offered for the best work by horses and by bullocks. A public meeting was held in October, 1856, when the society was formally inaugurated, and the rules and regulations governing the Port Phillip Farmers' Association, slightly modified, were adopted. In October, 1857, permissive occupancy was obtained of a piece of land opposite the hospital for a show ground, and here the shows were held for the next 30 years. The first grain show was held in March, 1858, and the first show for stock and implements in November of the same year. In 1886, the society had made such progress, and the entries had become so numerous, that it was necessary to procure a more suitable site for show purposes. This site was found on the racecourse reserve, where about £4,000 was spent in the erection of fencing and buildings, £3,000 being contributed by the society, and the balance by the District Racing Club. The reserve, which consists of about 87 acres, is controlled by a committee of management, three of whom are nominated by the society, three by the racing club, three by the residents of the district, and one by the Federal Defence Department. The exhibits of draught horses have always been regarded as of a very high order; and notwithstanding declining grants from the Government, the committee has been able to keep the prize list up to from £450 to £500 annually. The whole of the loan is now repaid, and the society had to its credit £16 4s. 6d. at the end of 1904.

Tatura and Goulburn Valley Agricultural, Horticultural, and Pastoral Society.

This society came into existence about twenty-nine years ago. It is governed by a president and 75 members of committee, consisting of the leading pastoralists and agriculturists throughout the district. Its objects are to further the agricultural and pastoral industries of the State by holding shows, awarding prizes, and

generally promoting the best interests of the farming, dairying, and grazing industries. Its show grounds, which are situated at Tatura, cover 25 acres, and provide comfortable and extensive accommodation for stock of all kinds. The land is valued at £650, buildings and improvements at £4,500, and represent a total asset of £5,150. The annual show, held in the third week in October, is popular, and commands up to 3,000 entries annually. Liberal and comprehensive prizes are offered, amounting to between £700 and £800 per annum. The annual revenue is about £1,400; members' subscriptions amounting to £700. The show is very successful, situated as the grounds are, within the district controlled by the Rodney Irrigation Trust.

The first agricultural classes, inaugurated by Mr. Wallace, the Director of Agriculture, were held under the auspices of this society. For many years past the society has held a special fruit display, showing the production of the irrigation district, and prizes are offered for the best managed farm, orchard, and vineyard.

During 1904, agricultural classes for young farmers were carried out by the Department of Agriculture, under the society's auspices, and the students have been for the second time successful in winning the A.N.A. gold medal for competition amongst all classes in the State. At the last Melbourne Royal Agricultural Society's show, this society had the honour of winning the 2nd prize (£50) in the Grand District Exhibit Competition.

Shepparton Agricultural Society.

In 1877, the farming and business people of Shepparton decided to form an agricultural society, and in the following year "The Shepparton and Lower Goulburn Valley Agricultural and Pastoral Society" was inaugurated. In 1885, the Horticultural Society of Shepparton was amalgamated with the larger body, and the term "Horticultural" was added to the title. In 1892, the name was abbreviated to the "Shepparton Agricultural Society." The original committee numbered 28 members, but the governing body to-day consists of a president and 150 committeemen, an excellent influence for the prosperity of the society being obtained by the large number of office-bearers. The objects of the society are stated to be "to promote the advancement of agricultural, horticultural, pastoral, and industrial pursuits, in such manner as from time to time may seem most advisable." In October, 1878, the first show was held upon a small allotment of land about an acre in extent, in the western portion of the town, close to the Goulburn River; but after the holding of the second show, this ground was found to be too confined for the purpose of the society, and, accordingly, a valuable site, 8 acres in area, was secured at the east end of the town, and close to the railway station, and here the third show was held. Subsequent additions have brought the area covered by the society's grounds up to 18 acres, and on it are now erected extensive and durable buildings, yards, and all necessary appurtenances for the display of exhibits, at an outlay of £3,500. In the early days, ploughing matches were held. In 1886 and 1896, the Grand National Show was held at

Shepparton. Up to 1900, one day was found sufficient, but since that time it has been necessary to extend the duration of the show to two days. In addition to conducting the show, the society gives attention to agricultural and producing measures, and in 1898 the Agricultural Society's Scholarship was founded for members' sons, the successful student gaining admission to the Dookie Agricultural College for one year. Visits of experts of the Department of Agriculture are also encouraged, and lectures on subjects appertaining to agriculture, manuring, and stock-rearing arranged. The society also undertakes annual visits to the Dookie College, accompanied by farmers of the district, and valuable knowledge of the different methods of farming, and the profitable culture of cereals, is thus attainable by producers. At the end of the year, the buildings and improvements were estimated to be worth £2,450. The receipts were £1,577, and the expenditure £1,354.

North Gippsland Agricultural Society.

The North Gippsland Agricultural Society was founded in 1861, at Sale, and was the first institution of its kind in Gippsland. It is governed by a president and a committee of 40 members. The annual show is held in the last week in October, on a good ground, 13 acres in area, situated about one mile out of Sale. There are numerous entries, and the attendance is a large one. In 1902, the Grand National Show was held on these grounds. The number of members is 220. The total receipts for the year were £593, and the expenditure £592. The bank overdraft was £13, and a liability on account of loan amounted to £900.

Other Agricultural Societies.

There are 87 other societies, all possessing ample and commodious show grounds, situated in or adjoining the more important towns throughout the State, and carrying out work of a similar, though perhaps not of so extensive a character.

Land Settlement.

A very useful lesson can be drawn from a close study of the information which is contained in the following table, showing the total amount of land of one acre and over in occupation in Victoria in 1904, according to the collected agricultural and pastoral statistics for that year, to be 32,181,048 acres, distributed amongst 52,598 holders. Of the total quantity about 13 per cent. is cultivated, 3 per cent. has been sown down in clover and lucerne, 76 per cent. is still under natural grass, and 8 per cent. uncleared. These figures need but little comment, and, when carefully analyzed, a very unsatisfactory state of affairs is seen to prevail in the various districts of the State.

At the present time, those districts which are apparently the least designed by nature for the purposes of cultivation are those which show the greatest area under tillage, whilst those districts which, lying close to the seaboard, enjoy a fairly uniform rainfall throughout the year, and which may be said to court the acquaintance of the

husbandman, are those in which comparatively little tillage has as yet taken place, but are used almost entirely for grazing stock over land still under natural pastures.

LAND IN OCCUPATION IN EACH DISTRICT OF VICTORIA, 1904.

(Areas 1 acre and upwards.)

District.	Number of Occupiers.	Acres Occupied.				
		For Agricultural Purposes.	For Pasture.		Other Purposes and Unproductive.	Total.
			Sown Grasses, Clover, or Lucerne.	Natural Grasses.		
PART I.						
Central ...	10,940	251,956	153,150	2,048,251	48,791	2,502,148
North Central	4,824	171,482	73,198	1,581,427	7,490	1,833,597
Western ...	8,700	219,346	155,379	5,724,097	137,060	6,235,882
Wimmera ...	5,583	1,173,592	1,237	3,680,934	122,411	4,978,174
Mallee ...	2,813	895,334	2,610	2,108,726	1,307,919	4,314,589
Northern ...	9,065	1,264,209	48,441	3,593,857	74,289	4,980,796
North Eastern	4,035	127,920	2,632	3,113,976	171,552	3,416,083
Gippsland ...	6,638	71,775	516,896	2,572,921	758,187	3,919,779
Total ...	52,598	4,175,614	953,543	24,424,192	2,627,699	32,181,048
		PERCENTAGE OF TOTAL OCCUPIED IN EACH DISTRICT.				
PART II.						
Central ...	...	10·07	6·12	81·86	1·95	100·00
North Central.	...	9·35	3·99	86·25	·41	100·00
Western ...	...	3·52	2·49	91·79	2·20	100·00
Wimmera ...	...	23·58	·03	73·94	2·45	100·00
Mallee ...	...	20·75	·06	48·88	30·31	100·00
Northern ...	...	25·38	·97	72·16	1·49	100·00
North Eastern	...	3·74	·08	91·16	5·02	100·00
Gippsland ...	...	1·83	13·19	65·64	19·34	100·00
Total ...	...	12·98	2·96	75·90	8·16	100·00
		PERCENTAGE IN EACH DISTRICT OF TOTAL IN STATE.				
PART III.						
Central ...	20·80	6·03	16·06	8·39	1·86	7·77
North Central	9·17	4·11	7·67	6.48	·28	5·69
Western ...	16·54	5·25	16·29	23·43	5·20	19·38
Wimmera ...	10·62	28·10	·13	15·07	4·65	15·47
Mallee ...	5·34	21·45	·28	8·63	49·78	13·41
Northern ...	17·24	30·28	5·08	14·71	2·83	15·48
North Eastern	7·67	3·06	·28	12·75	6·52	10·62
Gippsland ...	12·62	1·72	54·21	10·54	28·88	12·18
Total ...	100·00	100·00	100·00	100·00	100·00	100·00

Reducing the matter to percentages, as is done in the second and third parts of the table, the results are more clearly seen. In the Western District, containing some of the richest agricultural land in the State, there is only 3·52 per cent. of the total land occupied now brought under cultivation, whilst no less than 92 per cent. is left in its natural condition, and used solely for grazing purposes, and this notwithstanding its proximity to shipping facilities, and while it contains no less than 19·38 per cent. of the total occupied land in the State, it contributes only 5·25 per cent. to the total cultivated land. In the comparatively arid Wimmera, Mallee, and Northern Districts, the percentages of cultivated to the total land occupied, are 23·58, 20·75, and 25·38 acres respectively. Although the number of holders of one acre or more in these districts form but 33·20 per cent. of the total holders of the State, no less than 79·83 per cent. of the area cultivated belongs to these three districts. The Central, North Central, and Western Districts contain 46·51 per cent. of the holders, but only 15·39 per cent. of the cultivated area.

In the next table the distribution of cattle and sheep on pastoral lands is given for the year 1904-5. Horses and pigs have not been taken into account, as the former are found in large numbers in urban districts, and the latter on agricultural and dairying holdings; dairy cattle, store stock, and sheep only have been tabulated: —

AREA CULTIVATED AND STOCK, 1904-5.

District.	Acres Occupied, 1904-5.		Stock, 1904-5.		Stock—Equivalent of Sheep—per 100 acres of Pastoral Land.*
	For Agricultural Purposes.	For Pasture (including that classed as unproductive).	Cattle.	Sheep.	
Central	251,956	2,250,192	270,316	919,669	161
North Central ...	171,482	1,662,115	123,427	715,195	117
Western	219,346	6,016,536	360,122	4,173,458	129
Wimmera ...	1,173,592	3,804,582	52,871	1,859,428	63
Mallee	895,334	3,419,255†	31,249	185,996	15
Northern ...	1,264,209	3,716,587	225,421	1,372,545	98
North-Eastern ...	127,920	3,288,163	227,845	52,5443	85
Gippsland ...	71,775	3,848,004	403,725	415,957	116
Total ...	4,175,614	28,005,434	1,694,976	10,167,691	97

* Reckoning ten sheep as the equivalent of one head of cattle—as has heretofore been the basis of combination in Victoria and New South Wales.

† Excluding 2,624,037 acres of uncleared mallee.

It thus appears that, of a total of 32,181,048 acres in occupation, 4,175,614 acres, or something under 15 per cent., are used for agriculture, and that the remainder, the pastoral lands, are, on an average, carrying in sheep and cattle, only the equivalent of 97 sheep to the 100 acres. The Central District lands carry the equivalent of 161

sheep per 100 acres; the Western, 129; North Central, 117; Gippsland, 116; Northern, 98; North-eastern, 85; Wimmera, 63; and the Mallee, only 15.' On the agricultural lands (4,175,614 acres), 121,231 hands were employed on 31st December, 1904; and on the pastoral (28,005,434 acres), 21,098 hands.

Generally speaking, only about one-sixth of the land privately held in the State by 70,000 owners is under cultivation and artificial grasses; the remaining five-sixths being in its natural state. There is no doubt whatever that the future prosperity of the State will mainly depend upon the cultivation of the soil, and at the present time the question of population is therefore one of the most important matters for consideration. From 1891 up to the end of 1904, no less than 157,462 persons, mostly adults, have left the State, and the exodus is still continuing, of the very class it is most desirable to retain in, or to attract to, the country. Upon increased population will depend the revenue and security of our national debt. With such larger population, the railways would not only pay, even at rates much lower than the present, thus enabling farmers to obtain larger returns for their produce in all markets, but would be a considerable source of income, instead of a burden, as at present. The Customs revenue would be enormously increased at comparatively little extra cost of collection. All this, however, presupposes that the population is distributed throughout the State as the great agricultural and mineral resources of Victoria warrant, and not, as at present, with great urban aggregations.

Public lands in suitable localities, and of a character fit for agriculture, are not now available to any great extent, and the practice which has lately been established of large land-owners cutting up portions of their estates into small areas suitable for farms, is not altogether satisfactory, since the price is often beyond, and the terms unsuitable to, those requiring the land. To retain this desirable class of yeomanry in the State, it appears to be necessary not only to aid them in obtaining settlement on private lands, but also to place easily within their reach such areas of Crown lands as may be suitable for agriculture, and will support an average family. The value of such *bonâ fide* settlers to the community should form an element in the consideration of the purchase money or rental.

It is unfortunate that much of the State in common with the rest of the Commonwealth, is subject to recurrence of drought. The average rainfall is not to be depended on, if the mean of a period be derived from a series of extremely wet and extremely dry years, as is generally the case in Australia in districts more than 50 miles from the coast. As matters now stand, however, although land might be selected and profitably used perhaps for one or a few successive seasons, the producer becomes, on account of the almost certain return of drought conditions, unable to depend on the rainfall for the necessary watering of his land. There is no doubt that the prosperity of this State is largely dependent on its agricultural returns, which last year were valued at £9,400,519, and this dependence will probably be more and more pronounced as time goes on. As most of

the best land in the vicinity of markets or seaports is in many cases in private hands, but unused for other purposes than grazing, the Crown lands now available lie at distances remote from markets, where there are no good roads giving ready access to railways. If entirely dependent on the rainfall, the question of receiving a certain and adequate reward for industry would be problematical, since no certain forecast of the season can be made. Irrigation must, therefore, be resorted to, to render land cultivation profitable in all years. Small areas of intense cultivation, where the soil is good, as is generally the case, would then be able to yield sufficient return to support a family. With a judicious policy of irrigation, and resuming large estates for closer settlement, working hand in hand, people will be settled on land from which they may be certain of obtaining a good living; and the wealth and commerce of the State will also be increased by the population thus attracted from other places.

Agricultural Education.

Extracted from "A Survey of the Work and Progress of the Victorian Agricultural Department," by S. Williamson Wallace, Esq., Director of Agriculture.

Agricultural education has been intrusted to a council. The form this education has taken has been that of establishing two colleges, one of which, that at Dookie, has been a success, both as a college and as an experimental farm. I maintain, however, that what is of more immediate service to the agricultural community is the education of the farmers already engaged in farming, and their sons who are working with them, rather than the education of prospective farmers. The sons, in many cases, of those not at present engaged in farming may ultimately never take to the business.

The Department of Agriculture has for years had officers on the staff whose duty it has been to give single lectures on agricultural subjects to meetings of farmers, held under the auspices of agricultural societies. This work, although useful and interesting, cannot be called very educational, as the information given in one lecture does not lead to a better understanding of the next. To meet this difficulty I have had classes of instruction for farmers and farmers' sons, extending over several weeks, held during the last two winters, and this winter the classes are more popular than ever. Seven centres have been selected, namely, Nhill, Warragul, Tatura, Benalla, Wodonga, Rushworth, and Wangaratta, and the average attendance will exceed that of former years, possibly 50 students per class. The Department has made no special effort to form classes this season, as the agricultural societies secured students in sufficient number to form as many classes as could possibly be attended to with the officers available for giving instruction. This method of instruction has come to stay in Victoria, and will probably extend over the whole of Australia. Inquiries have reached me from other States, and it is only a matter of time before Australian agriculturists will realize that that is the best method of instruction for the greatest number which can be had at the least sacrifice of time

and money. However excellent this system may be, the winter season as a rule, is the only time when farmers and their sons can devote their days to lectures and study.

To meet all demands for classes during the winter months, the Department would require to maintain for a whole year a staff of lecturers who would work for three or four months only, or depend on picking up suitable men for the work during the winter season. Engaging men specially can be done to a small extent, but if it were attempted on any large scale failure would be the result. I have, therefore, after a great deal of consideration, and after consultation with Dr. Howell, who is now supervising the work of the lecturers, matured a plan of keeping them employed throughout the year, and I think there is every chance of making this scheme a success. To organize the matter thoroughly it would be necessary to form an educational branch of the Department of Agriculture, with a chief officer, who, besides teaching, would make all necessary arrangements and have the teaching staff under his control.

The method I propose is to hold evening classes of two weeks' duration at farm houses—the number of farmers attending at any centre to be from ten to twelve, and the classes to be held all the year round, except in the winter time, when the officers would be engaged at the farmers' classes, held in the townships, as is being done at present. If this system is to succeed, the co-operation of leading farmers in every district would be necessary—those who would lend a room for the purpose, and invite their neighbours to attend.

The lectures would be held in the evening, say one and a half hours' lecture, and half-an-hour devoted to asking and answering questions. Four lecturers would be required, one of whom would arrive on a Monday and stay three days lecturing and discussing such subjects as manuring suitable to the district, tillage, rotation of crops, and kindred subjects. On the fourth day he would leave for another centre, say 20 miles away, and would be replaced by an officer competent to lecture on farm stock, their breeding, and management. In two days the second lecturer would leave, being replaced by a third, who might lecture upon poultry, the best breeds to be kept for export and laying purposes, their management and feeding. Two days later this lecturer would be replaced by a fourth, who would lecture on other agricultural subjects. The course of instruction at this particular farm-house would then terminate after ten days' instruction. Four classes would be in progress at one time, in farm-houses sufficiently far apart to prevent overlapping, and yet near enough for the officer to reach the next centre and lecture on the same day. It will be at once seen that the success of such a scheme depends very largely on the patriotism of the leading farmers, as it is not every one who has a room that would accommodate ten or twelve farmers, and who would be willing to give that room up for two hours each evening for two weeks. As to the lecturers, they would find their way to the nearest township after the lectures were over—to cycle eight or ten miles on a summer evening would be no obstacle. I would not like the scheme to fail from any idea that it would be necessary to offer hospitality to lecturers.

I propose that these farm-house classes should be tried in August, when the farmers' classes held for a month in townships are finished, and the officers are available to do the work.

GENERAL REMARKS ON THE TOBACCO PLANT.

Extracted from a pamphlet by F. J. Howell, Esq., Ph.D., Chemist for Agriculture, &c.

The ready adaptability of the tobacco plant to a wide range of soil and climatic conditions makes its growth an easy matter, but the extreme sensitiveness of the plant to the slightest variations in these conditions, as manifested in the flavour and quality of the leaf, restricts the possibility of the successful growth of any one type to exceedingly limited areas. It is only a tobacco possessing certain well-defined qualities, and meeting the specific requirements which in the present highly-specialized condition of the industry are demanded, that is worth the trouble of growing. As Whitney remarks: "A nondescript tobacco is not worth growing, and should not be grown, as it lowers the price of really good types of tobacco, to the detriment alike of the grower and consumer." As there are certain tobaccoes then in demand—suited by their particular characteristics for certain specific purposes, and as these characteristics are the resultant mainly of particular soil and climatic conditions—it appears that the two lines of activity to be taken up in investigations connected with the industry are—first, to find out what kinds of leaf are in demand, and then to investigate the existence of the climatic and soil conditions capable of producing the desired characteristics. The second line of inquiry would involve laboratory investigations in the chemical and mechanical analyses of soils, as well as the establishment of numerous and widely-distributed observation stations, or, as the term is used here, experimental plots, where tests would be carried out with different varieties.

With respect to the kinds of tobaccoes in demand in different parts, an extract from a recent paper by Milton Whitney will convey an idea of the wide existing differences of opinion prevailing in different parts on the characteristics constituting desirable qualities in the product.

"The differences in the export type, known to the trade as 'foreign,' which are cured and manipulated according to the demands of the various foreign countries, are worthy of special consideration."

"To the general public such differences are sometimes hardly perceptible, but in the trade the slightest difference in shade, colour, thickness, shape or length of leaf, is taken into account in determining to what country or trade the tobacco is best suited. For example, Great Britain gives preference to a long, narrow olive-green leaf, which is required to be heavily fired; in fact, the stronger the odour of hard wood smoke, the more acceptable the tobacco is to the British trade. The Austrian Government prefers a long, broad, silky leaf, from medium to light brown colour. The Italian Government uses

the same type, only of shorter size and darker in colour, while the French prefer a tobacco that has been made exceedingly dark by means of steaming and hard pressure while hot."

The commercial grouping of tobacco is one of classes, types, and grades. The adaptability of a tobacco for a particular use, such as cigarettes, cigar, or smoking, marks it off as belonging to a class. The possession of certain qualities as flavour, texture, and colour, determines the type, while the grade expresses the measure of excellence of the leaves from any one type. The production of the different classes and types is the outcome principally of climatic conditions and the texture and physical properties of the soil. It will be recognised then that the production of the different classes and types cannot be successfully attempted on the same class of soil—that a soil adapted by its physical properties for the production of a large, heavy leaf of a high oil or gum content, will not produce a light tobacco. The adaptability of various soils to different classes and types of tobacco has received great attention at the hand of Whitney, in America, with the object of determining the conditions favourable to the best development of each type. The ultimate object, as stated, has been "to give a basis for the classification of tobacco soils, and for the improvement and modification of the conditions in many soils which are not, under present methods of manuring and cultivation, well adapted to any particular type of tobacco."

Prior to similar investigations being taken up in Victoria, the introduction of new and untried varieties is necessary.

The establishment of experimental fields, covering a wide range of soils, in which various varieties might be tested, would indicate the suitability of particular areas and particular soils for the production of different types. The examination of the soils, on which certain of these types might have succeeded, would then afford data for expressing opinions on the results of analyses as to the adaptability of untried areas for the same type. Until this data resulting from field experiment is available, the chemical and physical analysis of a soil will have a limited value only. Up to very recently, one type only has been almost exclusively grown in the North-Eastern district, as the general crop, and the large body of facts resulting from the experience of growers themselves, apart from the investigations of the expert, which affords so much valuable data to the investigator in America, is not available in the case of Victoria. From the experience of growers themselves in America, it has been found that certain varieties, through the yields and excellence of the product, have given a distinct character to certain districts. The work of the expert is to investigate the conditions producing these distinctive characteristics, and, by a comparative study of untried areas, to discover and suggest the possibilities of expansion beyond these restricted localities known by experience to be adapted for the production of these characteristics. In Victoria, in the absence of the growers' initiative, a wide distribution of variety tests must precede any large system of soil investigation. From the variety tests of last year, reported on by Mr. Smith, there is every evidence of the growers of the North-Eastern district being able to produce a tobacco very much superior to the

one formerly placed on the market. To obtain some general idea of the character of the soil in the district, a chemical and mechanical analysis of a number of samples taken from different localities was carried out in the laboratory. This examination reveals the presence of the most important plant foods in exceptionally large quantities. The soils may be regarded as of high fertility. The mechanical analysis discloses a texture indicating no very high retentive power for water, and therefore not adapted for the production of the heaviest types of leaf. The clay content, however, is higher than that of American soils producing the finest types of light yellow tobaccoes.

As, however, the type of a tobacco is the resultant of climatic as well as soil conditions, no reliable opinions as to specific adaptability can be formed by comparing the composition of a soil on one side of the world with that on the other; in fact, the determinative influences of climate on the tobacco plant have been shown to be so subtle as to fail detection by even metereological instruments. We must find that answer from the plant itself.

The chemical composition of the soil in relation to the tobacco plant.

No plant is so profoundly affected by soil characteristics as tobacco, but it is rather to physical character of soil than to chemical composition that we must ascribe the paramount influence exerted on the physiology of the plant. To quote Whitney again:—"It is practically true of tobacco, to a greater extent, perhaps, than of any other crop, that the texture and physical properties of the soil influence the physiology of the plant to such an extent as to determine and control the distribution of the widely-differing distinct types of tobacco. Soils producing a heavy shipping tobacco will not produce fine tobacco of any variety. Soils containing a large proportion of clay, or which for other reasons are very retentive of moisture, tend to produce large, heavy plants which cure to a dark brown or red. A lighter sandy soil produces a plant having a thinner and more delicate leaf, which, by proper treatment, can be cured to a bright red mahogany, or fine yellow colour. So marked is this influence of soil upon the quality of tobacco that a fine bright tobacco land may be separated by only a few feet from a heavy clay soil which will produce only a heavy manufacturing or export leaf."

Although the paramount influence of the physical composition of a soil is clearly recognised, the chemical composition also cannot escape consideration. A knowledge of this, by revealing deficiency or over abundance in a particular plant food, may suggest means by fertilization on one side or the reduction of "raging fertility" on the other, of so bringing soils under control as to exercise a decided improvement on the quality of the product.

A comparison of the average figures of the four important plant foods in the six Edi fields, with two American districts—Kentucky and North Carolina—discloses percentages in the Edi soils equally in three ingredients to the Kentucky, and considerably surpassing in all the North Carolina. It is possible that an addition of lime to some of the Edi soils might prove of advantage, but in all other respects the figures would appear to indicate that the use of fertilizers will probably prove of little effect.

FIELD EXPERIMENTS IN MANURING, 1903-4.

Extracted from a paper by F. J. Howell, Esq., Ph. D., Chemist for Agriculture.

I.—Hay Manuring Experiments.

The co-operative manuring experiments in Southern Victoria conducted during the season 1902-3 afforded facts of great value to the Southern grower. The marked operative effect of phosphatic manures in these experiments in the production of increased yields revealed a response to applications of phosphoric acid in the bulk of Southern soils, almost as striking as earlier experiments in Northern areas had shown to be the case in that part of Victoria. A new fact brought to light in the Southern experiments, which might be accepted as contradictory of earlier Northern results, appeared to be the large contributory share in the production of increased yields which applications of nitrogenous manures might be expected to play in certain crops of Southern agriculture. With respect to potash, the effective action of additions of this ingredient in the majority of the fields of the South agreed with what appeared to be the universal experience in the North. There appeared, however, indications that on certain types of soil in the South, potash might require to enter into consideration in a system of manuring intended for the production of maximum crops.

The experiments conducted during the season of 1902-3 were, it will be remembered, carried out under climatic conditions which might be regarded as exceptional. The country is just emerging from the serious position which followed as the result of these conditions. It appeared then necessary to seek confirmation of returns obtained under such conditions by results secured under more normal circumstances. The experiments in the South were, therefore, repeated over a large area, and in a more comprehensive way last year, and although the rainfall of this year inclined rather to the other extreme than the normal, the results taken together with the experience of the preceding year, may be accepted as a basis for expressing opinions generally as to manurial requirements. It is satisfactory to find that the results of two extreme seasons agree in the main points the experiments were intended to elucidate, and that the knowledge gained may be regarded as of distinct value to the agriculturist.

The system of experimenting.

All the tests were carried out in co-operation with farmers who provided the land, and gave the necessary assistance in putting in and taking off the crops. Special efforts were made in the present tests to gain regular and reliable results. Each crop was sown by a Government field officer, with a grain drill specially adapted for the continuous regular discharge of fertilizer and seed. The crops were inspected during growth by the officer, who himself applied the top dressings where necessary. Each plot was harvested with the binder, and stooked, under the supervision of the officer, and the same precautions were afterwards observed in weighing results. Prior to the sowing of the crop, the land, which had been set aside for the purpose by the farmer, was inspected, with a view to determining its suitability. In a percentage of cases there was not that regularity

in the nature and treatment of the soil which is so desirable a feature in tests of this character. Depressions and rises, clay or sand patches, introducing differences in both chemical composition and mechanical character, finishing furrows and other disturbing factors not considered deserving of notice by the ordinary observer, but of supreme concern to the experimenter, were too frequently present, all helping to contribute in places to those irregularities in returns which at times appear to flatly contradict results obtained from another portion of the field. It will be recognised, however, that these are conditions which must be expected, and to an extent accepted in any system of co-operative farm experimenting. They may be met, and their disturbing effects largely obviated by the elimination of returns from portions of a field so affected; by the introduction of double checks, and by the consideration of the average returns of large numbers of fields in which individual irregularities are made to disappear, and certain broad features, generally characteristic of the soils of a district, brought into prominence. It must be recognised, however, that, under the most favourable circumstances the conditions for experimenting obtaining on a farm can never equal those possible at an experimental station, where continuous takes the place of intermittent observation, and where the selection of locality, the preparation of the soil, time of sowing, and time of harvesting can be suitably arranged, and the whole set of operations adjusted to the attainment of an ideal set of conditions. But, admitting disadvantages in these particulars, a wide system of co-operative field tests carries advantages in other directions, and the Victorian farmer, I think, has recognised the fact.

On each farm the area experimented on was 1 1-3 acres, and plots were selected so that the width corresponded to one sweep of a small fertilizer drill, and also adapted itself to easy harvesting by one sweep of the binder. Variations in regard to the manures used were introduced, to meet differences in climatic conditions, and make the range of tests wider.

The object sought in the experiments.

The scope of the field of inquiry covered by the experiments is a wide one, and answers have been sought, not only as to soil deficiencies, but as to particular forms of plant food, and combinations best meeting these deficiencies, in dealing with the tests to which the various manures were subjected, effort was made to answer the following questions:—

1. The effects of applications of phosphoric acid alone.
2. Of phosphoric acid and potash.
3. Of phosphoric acid and nitrogen.
4. Of phosphoric acid, nitrogen, and potash.
5. The comparative effects of sulphate of ammonia and nitrate of soda in combination with phosphoric acid alone, as well as in combination with phosphoric acid and potash.
6. The effect of light, heavy, and medium additions of a nitrogenous manure to medium dressings of superphosphate.
7. The effect of light addition of nitrogenous manure to light applications of a superphosphate.

8. The comparative effect of equal quantities of the three forms of phosphate manure, viz., superphosphate, Thomas phosphate, and bonedust.
9. The comparative effect of equal quantities of Thomas phosphate and superphosphate, both alone and in combination with the two forms of nitrogen and the two forms of potash.
10. The effect of equal quantities of sulphate of ammonia with the sulphate and chloride of potash.
11. The effect of equal quantities of the chloride of potash with nitrate of soda and sulphate of ammonia.

Results of the year's experiments.

There were more than 70 fields established last year in Southern Victoria, but, owing to the loss of many crops through caterpillars and heavy and continuous rains during harvesting, results of reliability were finally available from 50 fields only, which were fertilized. The results confirm in a remarkable manner the returns obtained in the preceding year's tests, both in regard to the average returns of the unmanured plots, and in the increased yields following applications of manure—whether phosphatic manure or the combination of a phosphatic with a nitrogenous and potassic. The experiments attest the splendid effect produced by phosphatic applications on soil productivity, and the stronger operative effect of superphosphate, as compared with Thomas phosphate. Experiments with bonedust indicate the absence of any marked difference from the superphosphate, particularly in rainy seasons.

Summary.

The results of the hay manuring experiments are summarized as follow:—

1. The effect of phosphatic fertilizers on Southern soils is most pronounced.
2. In the comparative tests between the three phosphatic forms of superphospate, Thomas phospate, and bonedust, results point to an undoubted superiority on the part of the first manure, both in the larger yields produced where equal quantities of the three have been used, and the larger accruing money value of the increase in produce over the cost incurred.
3. Bonedust, owing to an improvement in mechanical condition and probably to its nitrogen content and the response of Southern soils to this ingredient, has, used in equal quantity with the two other forms produced, increased yields larger than Thomas phosphate, and almost equal to superphosphate. Owing, however, to its much higher price it cannot compare from the point of view of resulting profits with the second manure.
4. Thomas phosphate fails to show, in the increased yields produced by the use of equal quantities, figures equal to those of bonedust, but owing to its much lower cost, the difference in resulting profits is not so great as the first consideration would appear to indicate.

5. Numerous comparative tests between equal quantities of superphosphate and Thomas phosphate, both alone and in combination with nitrogenous and potassic manures, establish firmly the greater effective power of the first fertilizer, and although the market rates for Thomas phosphate are lower than those ruling for the great bulk of superphosphates, the profits resulting from the latter are very considerably in excess of those of the former. It should, however, be noted that the analysis of last year's Thomas phosphate showed a grade of that manure below the standard formerly obtainable on the market, and much below what European analysis shows it ought to be, and it seems probable that with an improvement in quality it will compare very favorably with superphosphate.
6. Nitrogenous manures find an almost universal response on southern soils, and have resulted generally in increased yields sufficiently large to give substantial profits.
7. In the results of the tests between the nitrate and ammonia form, there seems sufficient evidence to justify the premier position in effective power being given to sulphate of ammonia.
8. In the tests to decide the effect of light, medium, and heavy dressings of a nitrogenous manure, it appears that the progressive increase in yield following heavier applications are not sufficiently marked to justify the larger quantities used.
9. Increased yields appear to follow a light application of a phosphatic fertilizer (1cwt. per acre) used in combination with a light application of a nitrogenous manure (½cwt. per acre)—superior to those produced by a heavy dressing of a purely phosphatic fertilizer.
10. Medium and heavy dressings of a nitrogenous fertilizer (1cwt. and 1½cwt.) in combination with medium dressings of a phosphatic manure (2cwt.), show a considerably reduced effect, relatively, to light applications in combination with light phosphatic dressings.
11. The effect of potash generally has not been sufficiently pronounced to merit marked consideration.
12. Where the two forms of the sulphate and chloride of potash have been used, there has been a striking regularity in the operative effect shown by each, both in combination with superphosphate and Thomas phosphate alone, as well as in combination with the addition of a nitrogenous manure to the two phosphatic forms.
13. Chloride of potash used with sulphate of ammonia—a combination in which poisonous compounds resulting under certain conditions are supposed to act injuriously to plant life—appears, with a few exceptions, to have produced results closely corresponding to those obtained from a combination of potash sulphate with the same ammonia salt.

14. The financial aspect of the results of the experiments are most satisfactory, and taking the mean of the extreme prices ruling at different periods for the crop in question as a basis for calculation, it appears that for an expenditure of from 12s. to 15s. per acre in manure, increased returns of a money value, taking a low estimate, of from 30s. to 40s. may be expected. These remarks are not, of course, intended to apply to soils of well recognised exceptionally high fertility requiring no fertilization. The productivity of his farm will indicate to each farmer the necessity or otherwise of considering in his case the questions here dealt with.

II.—Grain Manuring Experiments, Northern Areas.

The very numerous experimental manure fields established throughout the whole of the northern wheat-growing area, during the years 1899-1902, appeared to give conclusive answers to the most important questions of fertilization concerning that portion of Victoria, and left little to be attempted in that part in the solution of manurial problems of immediate concern. It, however, appeared desirable to be in a position to anticipate possible future requirements, and to secure indications of the possible effect of the continuous exclusive use of phosphatic manures over long periods of time. With this object in view, as well as with the idea of gaining an insight into the effect produced by different systems of cultivation, a number of large experimental fields was established on various farms in the north. In only two cases out of six originally established have the experiments been continued up to the present time. Although it is yet early to make comparisons between results obtained from the different systems of cropping and cultivation, a few important facts appear evident in the returns already obtained, and it appears desirable to now give these publicity. It must be recognised that such tests, conducted on the same plots for 10 or 15 years, would afford information of incalculable value to the northern wheat-grower. The arrangement with the farmer terminates at the end of six years, and a renewal of the term for a like period is certainly advisable.

The effects of fallowing.

A comparison of the yields obtained in 1903 on the plots continuously cropped, with those obtained from the plots where a year's bare fallow has intervened, reveals the increases due to the latter system, and such a comparison ought, after some years, to indicate pretty clearly the system to be adopted with advantage by the farmer.

The good effect of fallowing may be due to various causes. It may follow on the results of conservation of moisture, from the disintegration of mineral matter, from improved physical conditions, or from organic operative agencies, working in the direction of the conversion of unavailable forms of nitrogen into available forms. With the magnificent rainfall of last season, it can hardly be thought that the larger yields of the fallowed plots were in any way due to a larger soil moisture content.

The effect of sub-soiling.

The various cultivation tests are not yet in a sufficiently advanced stage to admit of discussion. The effect of sub-soiling, however, appeared sufficiently marked to justify some reference. Both in the appearance of the growing crop and the actual results obtained in weight of grain and straw, there appears evidence for concluding that a deeper cultivation in the more compact clay soils of the north will result in a considerable improvement in yields.

The residual effects of manures.

The fact of the full profits, resulting from the use of phosphatic manures, not being contained in the first year's returns, has already been demonstrated to the farmer by field tests conducted by this branch. In these tests, the residual effects on a second year's crop have been determined and made known. It is, however, a little surprising to find that such small quantities as 10 and 20 lbs. of a superphosphate are capable of exercising so marked a residual effect after a period of four years from the first application. In the year 1900 a small field embracing 15 plots, each 1-5 of an acre in area, was put down on a farm at Wycheproof. In the following year the field was let out to grass, fallowed the next year, and then cropped the succeeding season without manure. The increased yields due to manures, both in the first and fourth years, were very evident. With the exception of one or two irregularities the effects appear consistent throughout.

The Northern results summarized.

The pronounced effect of phosphatic fertilizers is only confirmatory of the results of former experiments, but the whole of the present returns tend to show a considerably more marked effect from these fertilizers, under the ample moisture supply of last year, than under the prevailing drier conditions of preceding seasons. The limits, however, of an effective application with an ample moisture supply, are lower in these returns than expected, and appear to be somewhat below, rather than above, 80lbs. of superphosphate to the acre. The natural fertility of the soils under review, judging from the returns of the unmanured plots, may, however, be considered a high one, and on soils below this standard larger quantities would probably prove effective. The wet season appears to have specially favoured the effective action of Thomas phosphate, raising it apparently in instances to an equality with that shown by the higher grades of superphosphate at present on the market. There appears, further, in the returns, evidence for concluding that northern soils which hitherto, with few exceptions, have remained passive to nitrogenous applications, may show, under an ample moisture supply, a response to such treatment, and indications are also present that continuous grain cropping, year after year, with phosphatic fertilizers, may, after some years, lead to soil conditions in which the application of a nitrogenous manure, in addition to a phosphatic, may also become a necessity. It is, with the data at present to hand, a little early, perhaps, to draw such conclusions, but the easy possibility of such an occurrence demands attention. Such a contingency suggests the advisableness, where the three year course of crop, grass, and bare fallow is not the practice, of occasionally intervening some leguminous winter crop, such as peas, the cost of which might be profitably covered by feeding

off in spring. Such a practice has in instances been successfully carried out in the north. The returns appear also to show that the use of small quantities of gypsum mixed with the superphosphate may prove of some slight value on certain soils of the north—deficient possibly in lime, or of a mechanical condition tending to set the soil and interfere with the development of the plant in its earlier stages of growth. The few tests carried out on different methods of applying manures favour largely the application with the drill, equal quantities of superphosphate applied broadcast as a top dressing after sowing the grain, as well as ploughing in prior to sowing, showing considerably smaller yields than those obtained from the applications made with the drill.

GENERAL REMARKS ON DISEASES PREVAILING IN THE LIVE STOCK OF VICTORIA.

By A. A. Brown, Esq., M.B., B.S., Inspector of Foods for Export, &c., Department of Agriculture.

The remarks made and published in the *Year-Book* for 1902 on diseases prevailing in stock in Victoria admit of certain amendments, as further investigations revealed diseases not hitherto encountered in certain species.

Horses. Horses are particularly free from malignant infectious disorders. Glanders and Farcy do not prevail anywhere in Australia. Pneumonia and Strangles are the principal infectious disorders to which they are subject. Tuberculosis does not have a place in the category of Victorian horse diseases. Stringhalt, a condition concerning which no definite pathological knowledge at present exists, is prevalent in many districts. The common parasitic diseases in our horses are (1) Bots—the larvæ of the gadfly (Gasterophilus Equi)—inhabit the stomach, and another variety (Gasterophilus Hæmorrhoidalis) inhabit the rectum; (2) Round Worms—the Spiroptera Megastoma, or Reticulata, or Sclerostomum Tetracanthum, produces tumours in the stomach of the horse. This worm in the course of development passes through the body of the meal worm, the larvæ of the meal beetle (Tenebrio Molitor). The Tenebrio Molitor is now extensively found in Victoria. A few years ago it did not exist on the farms nor about stables, but was confined to the grainhouses. By means of the meal worm, the embryos of the Spiroptera Megastoma are carried far and wide. The Strongylus Armatus is found in the mature state in cysts in the intestines, and in an immature state in aneurisms of arteries of the abdominal cavity, particularly the anterior mesenteric. A large round worm (Ascaris Megalocephala) and a small thread worm (Oxyuris Curvula) inhabit the intestines; (3) a tapeworm (Tænia Perfoliata) is frequently observed.

Cattle. The infectious diseases observed in cattle are Tuberculosis, Actinomycosis, Anthrax, Symptomatic Anthrax (Black quarter) and Pleuro-pneumonia. Rinderpest, Eczema-epizootica (foot and mouth disease), Texas Fever, or Tick Fever, a disease dependent on a malarial organism, Pyrosomum Bigeminum, and introduced into the

blood of cattle by the cattle tick (Ixodes Bovis), do not exist in the State. The herds of Victoria are not seriously affected with tuberculosis. In consequence of the mildness of the climate, cattle can be kept in the open all the year round, and this continuous life in the open is conducive to the health of animals, and to the suppression of this disease. Tubercle does not prevail to any greater extent than about 5 per cent. in Victorian cattle, and, as greater care is now being exercised by stock-owners in the feeding and shelter of milch cows, it is hoped that in a few years the percentage will undergo a material decline. Parasitic diseases are rare in Victorian cattle. The stomach fluke (Amphistoma Conicum) and the liver fluke (Distomum Hepaticum) are occasionally seen. "Measles" (Cysticercus Bovis), the hydatid stage of the Tænia Mediocanellata (a large tapeworm in man) has only been once noticed, but small tumours in various situations amongst the muscles caused by the Spiroptera Megastoma have been occasionally found. "Warbles," tumours in the skin, caused by the Hypoderma Bovis, or ox gadfly, do not exist in our herds.

Sheep.

The infectious diseases prevailing in sheep are Multiple Abscess or Pseudo-tuberculosis, Malignant Œdema, Tetanus, Foot-rot, Pneumo-enteritis, and Anthrax. Tuberculosis does not occur. Pneumo-enteritis, or Epizootic Catarrh, the "Bradsot" of Europe, a disease due to a sporulating bacillus about 3·5 micro-millimetres long, prevails to some extent. The disease probably prevailed extensively in New South Wales in 1834-5, causing great mortality in those years. The symptoms are, fever, running at the eyes and nose, and great prostration of strength. Putrefaction sets in very early after death, and the smell emitted is offensive and sickening. The carcass rapidly swells up, and turns black, and the wool is readily pulled out. The germ is an anærobe, growing on gelatine and agar, and liquefies gelatine. The parasitic diseases are, fluke (Distomum Hepaticum, D. Lanceolatum), stomach worms (Strongylus Contortus), lung worms (Strongylus Rufescens, or Filaria) and tapeworms (Tænia Expansa). The Sheep Blowfly (Calliphora Oceanicæ) is a source of great trouble in some parts, particularly in New South Wales. Other flies besides the Calliphora may also be concerned in producing the annoyance which may be provocative of considerable mortality. Scab (Dermatodectes Ovis) and sheep-gadfly (Œstrus Ovis) do not exist.

Swine.

Swine Fever, Tuberculosis, and Actinomycosis are the contagious diseases in our swine. In 1901 there were 350,370 pigs in the State. In March, 1903, I announced the outbreak of swine fever, and since that time the plague has caused great loss. The Government Statist estimated that there were 286,075 pigs in Victoria at the end of 1904, and this shrinkage was no doubt due to mortality caused by the prevalence of swine fever. As regards parasitic diseases, hydatids (Echinococcus Veterinorum) are occasionally seen. Trichinosis (Trichina Spiralis) and "Measles" (Cysticercus Cellulosæ) the hydatid stage of the tapeworm, Tænia Solium of man, do not exist here.

Rabies (Hydrophobia) does not exist in Victoria. Distemper is the chief infectious disease prevailing. Worms (round and tape varieties) are common parasites. Dogs.

There are no infectious diseases prevailing in goats in Victoria. Goats.

Tuberculosis, Roup, Avian Diphtheria, and Fowl Cholera, are the infectious disorders. The common parasites are the hen mite (Dermanyssus Avium) and a mite (Cytodites Nudus) which lives in the subcutaneous tissues, and in the lungs, and on the pleural and peritoneal surfaces. Round worms (Ascaris Inflexa) Heterakis Papillosa, and Sclerostoma Syngamis) and Tapeworms (Tænia Proglottina and T. Infundibuliformis) are very rife. Fowl ticks (Argas Americanus) prevail in limited areas, and are very destructive, causing fever and death. The Department of Agriculture is putting forth efforts to eradicate this pest from the State. Poultry.

ENTOMOLOGY.

Extracted from the Report of C. French, Esq., F.L.S., F.E.S., Government Entomologist.

During the year investigations and experiments have been extensively carried on. The root-borer experiments have proved that trapping in itself is insufficient to stamp out this pest, and although a reward has been offered for the best means of exterminating the insects, no real practical solution of the trouble has as yet been brought under notice. The root-borer is one of our very worst pests, as for years the fruit-growers were unaware of the cause of the trouble, and when this was found out, in most cases, the badly affected trees were either dead or dying, the grubs in the roots being most difficult to treat successfully. This matter is receiving careful attention. Investigations and experiments.

The grasshopper fungus tests have been followed up. The fungus, which is fatal to grasshoppers, but harmless to all other forms of life, is supplied in tubes, for diffusion over infested districts. My suggestion as to making a small charge for the material has made a large difference in the number of tubes applied for, the number of tubes sent out during the present year being 842, and the amount received for them £36 6s. The letters received as to the value of this important discovery continue to be most satisfactory. The tubes on the present occasion have all been prepared at the chemical laboratory over which Dr. Howell presides. Experiments on the San José Scale with lime, sulphur, and salt, are still being carried out. A new material placed on the market in the shape of "red oil" gives promise of excellent results.

The peach aphides, both kinds, have not been so bad as in former years, constant treatment having had a very marked effect, the peach crop of last season having been an exceptionally heavy one.

The onion land in many parts of the rich Drysdale district has still resisted our efforts to free it from the eel-worm, though the experiments carried out demonstrated that the wire-worm and other pests of

a caterpillar nature could not be destroyed by means of gypsum, sulphate of iron, and other materials. The experiments will be continued—we trust with success.

Further experiments for the eradication of the St. John's Wort have been made, and now that a sum of money has been granted for the purpose, we hope to be able to state what we have found to be the cheapest and most effectual methods of treatment. It is satisfactory to know that this plant can be permanently destroyed by means of certain chemicals, and the publication of a pamphlet, with coloured plates, and methods of treatment, has been authorized, and is now in course of publication, for broadcast circulation amongst country municipalities, farmers, graziers, State schools, &c. Dried specimens of the plant have been sent to most of the municipalities throughout the State.

Lectures upon various subjects have been delivered by the field members of the staff (inspectors under the Vegetation Diseases Act), and have been well attended.

Inspections.

The inspection of orchards, nurseries, and gardens, has been carried on energetically, but the operations connected with the eradication of St. John's Wort have increased the work of the inspectors. Some indication of the extra work entailed upon the officers may be gleaned from the fact that, according to the report of the Government Statist, the area under orchards has increased at a rapid rate, and in 1902-3 consisted of 45,885 acres[1], the latter being the area of orchards cultivating fruit for sale, and in addition to the above there are no less than 5,976 acres[2], laid down in private gardens growing fruit for home consumption.

Inspection of the nurseries still continues on a satisfactory basis, this being one of the most urgent portions of the inspectorial work. These nurseries are inspected every six months, and when found clean and free from disease are passed by the visiting inspector and a certificate to that effect given. The system of nursery examination has been very successful, especially in the United States, and it should be equally successful here. It is to be hoped that the other Australian States may soon follow our example, as it is in the nursery that the real danger lies, and it is to it that San José Scale and other serious pests have invariably been traced. During the year 1931 certificates have been issued by this branch, the number of packages of plants exported under our certificate being 3,637.

The work of destroying old and worn-out infected orchards, mostly relics of land-boom times, continues, and no pains will be spared to get rid of this nuisance, as well as menace, to the grower, be he growing for sale or otherwise.

Fumigating and treatment of used fruit-cases.

Plants and cuttings coming into Victoria from foreign parts, or from the other States, are fumigated at the Burnley Gardens, if a certificate that they have been treated at the port of shipment does not

[1] In 1904-5 this area had increased to 47,205 acres.
[2] In 1904-5 this area had decreased to 5,546 acres.

accompany the consignment. Even when they have been thus certified, the entomologist reserves the right of examination, and, if necessary, a second fumigation. In the North-eastern districts, many orange and lemon orchards have been treated by means of the cyanide gas, the tent being available to those applying for it. Owing, however, to the capricious changes in our climate, the results have not always been quite satisfactory. The necessity for dipping, *i.e.*, scalding, used fruit cases, appears to be plainer than ever, as it is largely through the agency of these cases that the grubs of the codlin moth are distributed. The matter is now under consideration, the trouble being in working out a scheme for the proper treatment of a large number of cases with a minimum of inconvenience and expense to the grower. Dipping the cases is of the greatest importance, but on a large scale extremely difficult.

Miscellaneous insect and bird troubles.

The grasshopper pest having been successfully tackled, it remains for this branch to devise some practical means for the suppression of the caterpillar plague, so much dreaded by the farming community. The trench system on large areas, and the food poisoning by means of arsenic, bran, and treacle, for small holdings, have been tested and found to be quite satisfactory.

With regard to the probable introduction of "fruit flies," there appears to be a grave and increasing danger, no less than fourteen larvæ of the Mediterranean fruit fly having been found in one mandarin orange, taken from one lot, which was promptly condemned. This consignment had been sent from Maryborough (Queensland) and had not been fumigated, and if it had been so treated the results would probably have been the same, as the cyanide would be unlikely to affect grubs inside any fruit.

Whilst on the subject of fruit flies, I desire to point out that the inspection here is as perfect as circumstances will permit; but that the said inspection will keep out the fruit flies, the enemy to fruit-growers most of all to be dreaded, is impossible, and I take this opportunity to point out this fact to the fruit-growers of the State. There is but one of two evils, either to prohibit all citrus fruits and bananas, in fact all soft fruits, from certain outside sources, or to take the risk of introducing these pests into our State, and, as I mentioned previously, this matter is of the gravest importance, and should have the best consideration of all concerned. As showing the importance of our banana and orange imports, it may be mentioned that during the past year the value of the former was no less than £81,700, and of the latter, £68,000.

The arrival of an enormous quantity of rice, 136,586 sacks, badly infested with the larvæ of the "dried-flour moth" (*Ephestia Kuhinella*) has given us some concern, but as this rice is to be converted into starch we have allowed it to be treated under our supervision. The grain sent from India and other countries is very dirty, and should be fumigated at the port of shipment. This is important.

The English starlings, after having driven off most of the small insect-eating birds, are increasing with extraordinary rapidity, and if some prompt and decisive measures for their destruction be not soon taken, the fruit-grower has a serious time before him.

Examination of imports and exports.

No less than 653,639 bunches of bananas were imported during the year, out of which number 59,849 bunches were condemned, either on account of the presence of fruit fly larvæ, or as having become heated on the voyage, the refuse being either towed outside the Heads by means of barges, or given to the cow-keepers, who have, under our supervision, to steam all fruit before carting away.

Besides lectures, inspections and experiments, the entomological branch carries on a great deal of correspondence, possesses a library of books and publications on technical matters, and controls a valuable museum of economic entomology and ornithology, which teachers from the Education Department, pupils of the Veterinary College, and members of the Field Naturalists and Science Clubs have visited, and from which collections are sent to exhibitions and shows of agricultural societies.

FORESTRY.

Previous issues of this work emphasized the desirability of curtailing, in the interests of economic forestry, the facilities granted to saw-millers and splitters to denude Crown lands of their timber. The beneficial effects on climate of the presence of forests should insure their preservation. Where observation has extended over a prolonged period, as in the countries on the Mediterranean border, marked changes of climate have been noted, and are ascribed by scientists to the denudation of the forests. The evenness and comparative mildness of the seasons have given place to alternations of drought and flood, and consequent desiccation and erosion of the soil, with diminution of fertility. Forest mould is deep and absorbent, and the trees protect it from the direct action of the sun's rays, and the springs and small streams thus originated regulate the irrigation of the lower lying areas. In Victoria there is a marked difference in the rainfall of open, treeless districts, and that of forest regions, and the clearing effected by settlers has reduced the volume of water in the rivers and creeks.

Forest legislation in this State has done little in the way of preserving the trees. Of a total area of 56,245,000 acres, Victoria has a forest area of 11,797,000 acres. There are 4,327,142 acres of existing forest reserves, and 332,133 acres of timber reserves, the remainder of the 11,000,000 acres being the area of practically inaccessible mountain ranges, where economic forestry is rendered difficult. Extensive areas of the best natural forest country, such as the Dividing Range, have long since passed from the Crown. The Conservator of Forests and his officers have striven during the past seventeen years to preserve intact the limited areas now left to the State. A Bill

drafted by a Royal Commission on State Forests has, however, been shelved in favour of other legislation, and its salutary provisions have not yet become law.

The Governments of the principal European nations, as well as those of Canada and the United States, have seen the necessity for forest conservation, and many of them have taken steps towards reafforestation. But in Victoria the area of woodland is proportionately less than those of Russia, Sweden, Norway, Prussia, Baden, Würtemberg, Austria, and Hungary. In the report of the work of the Forestry Branch for 1903-4, published in the Journal of the Department of Agriculture, the following facts are noted:

Restrictions enabling proper modes of conservation to be carried out are strenuously resented by interested parties, and the urgent necessity for systematic and regulated foresting is apparently unperceived. Good forest conservation work was, however, achieved during the year. The timber needs of the community can only be met by an immediate strengthening of the hands of the administrators, in order that the perpetual encroachments of interested persons and corporations may be withstood. The regulations made by the Governor in Council give no kind of security for consistent administration or fixity of purpose, and legislation to prevent further alienation of forest lands is sadly needed. Such alienation means a perpetual loss to the State, and the Minister has stopped it for the time being. The continuance and expansion of the royalty system lately introduced is advocated. Grazing on the forest and timber reserves should be under the control of the Forest Branch, and subsidiary to the larger forest interests. It is more profitable to reproduce valuable eucalypts than to rent the areas for grazing. The issue of licences is unwise, the timber-getters often using fire carelessly, thus originating extensive bush fires. Stringent precautions were taken by the officers of the Department in the summer to prevent bush fires. The heavy rains, however, proved the salvation of the trees. An annual lesson to State-school scholars on the "Careless use of fire" is recommended, and an article in the *School Paper*. Sleeper-hewing has been continued throughout the year. It is pointed out that if the Railway Department would accept a proportion of lesser-sized sleepers in their contracts for full-sized ones, some waste, at present necessary, would be avoided. Wattle plantations have been extended; but, in view of the fact that a substitute for tan bark will probably be forthcoming shortly, any large development of wattle-growing for purposes of profit is discountenanced. Strict supervision has prevented the waste of valuable timber; but the field staff has been greatly hampered by the total inadequacy of the fines inflicted for serious forest offences. Thinning for the improvement of the reserves has also been carried on, and inferior and crooked timber removed. The exploitation of the forests for the benefit of other great industries, which has been the rule in the past, prevents any large revenue being obtained from the forest industry. Insect pests and parasitic growth cause the foresters some concern, the prevalence of the former being due to the enormous mortality of

insectivorous birds, through the laying of poisoned grain for vermin destruction purposes. The discontinuance of ringbarking permits is recommended, unless operations are carried out under the direct supervision of a forest officer. In the near future it will probably be necessary to close for a term of years, either in whole or part, for particular kinds of forest produce, certain areas of forest.

A useful and informative paper on "Forestry in Victoria" is furnished by H. Mackay, Esq., as follows:—

FORESTRY IN VICTORIA.

By H. Mackay, Esq.

The true aim of forestry is the preservation of the forests of a country by wise use. In practice, it embraces a knowledge of rocks and soils, the food of the plant life which covers them; of botany, the knowledge of vegetable living bodies; of chemistry, the science which reveals the nature and properties of bodies; and of sylviculture, the rational treatment and working of forest areas, so as to maintain them in a timber-yielding condition. It includes also planting and sowing where Nature has clothed the surface of a country with niggard hand, or where, by the action of man or the ravages of fire or tempest, areas have been denuded of tree vegetation and rendered unprofitable. But the primary function of the forester in a newly-settled country is to maintain and increase the sylvan wealth with which Nature has clothed hill, valley, and plain, by regulating and correcting wasteful or inferior growth, while at the same time carefully restricting the yearly output of timber and other produce to such quantity as the forest can safely yield without deterioration.

Forest Area and Plan of Working.

Victoria, with a total area of 56,245,000 acres, has about twelve million acres of woodland. Of the latter, over 4,600,000 acres are set aside as climatic reserves and for the production of timber, but no portion is formally dedicated in perpetuity for the purpose of forest and water supply. Of the State forest domain, some 3,000,000 acres are situated on the slopes of high mountain ranges, and their protection is essential for the maintenance of streams and springs; over half-a-million acres are situated in the extreme Eastern part of the State, but, owing to difficulties of transport, are not at present accessible for practical working; half a million acres, chiefly in the central district, which have been cut over, are closed for the protection of the young timber; while in the remaining area, over 600,000 acres, timber cutting is carried on in various parts. The bulk of the forest revenue is, however, derived from a total area of about 100,000 acres, the trees being felled on the selection system of treatment; while for the supply of mine-props and fuel, large blocks are allotted and worked as coppice, or coppice under standards, thinnings only, light or severe as the circumstances require, being taken out in some districts. The Government having accepted the principle that the forests should not be worked at a loss, it has been the duty

of the present writer to assess royalty charges in such a way that the State may obtain a fair return for its timber and other forest produce. The licence system, which enabled cutters to get timber irrespective of quantity at a fixed charge per month or per quarter, is now happily abolished in the greater part of Victoria, and while the revenue from all sources is expected this year to exceed £20,000, leaving a credit balance for plantation work, the stricter control which can be enforced over the operations of timber-getters is of much more importance than mere revenue.

Tree Distribution.

In the early days of settlement little care was exercised to delimit and protect for the use of the community the best forest areas on the plains and lowlands. In some instances, indeed, good agricultural land bore excellent hardwood, such as redgum, and with some reason the claims of the State yielded to the pressure of settlers, whether the land was required for tillage or pasture. But in the case of the poorer lands, such as the auriferous belts of Silurian formation, bearing ironbark and grey box, which stretch from the river Goulburn westward to the Northern Pyrenees, there was seldom any valid reason for alienating inferior soil, fit only for the grazing of sheep. It bore, naturally, the best crop the soil was fit to yield, but this was speedily ringbarked and destroyed on thousands of acres in the endeavour to improve the pasture. In the same way, in Gippsland, the areas of forest redgum, a timber of exceptionally fine quality, were quickly alienated, so that, to-day, the State possesses only 300 acres of this hardwood in the whole of the Eastern division.

The early sale, in large tracts, of the fine volcanic lands of the Western District, and their long retention as a vast sheep-walk, have undoubtedly had an evil effect on the proper settlement of Victoria. Not the least mischievous result has been that, as the population increased, land selectors had to endeavour to make homes for themselves in the thick virgin forests of the Otway Peninsula and Western Gippsland, thus destroying by axe and fire in a few years enormous areas covered with valuable hardwood, as well as woods of fine grain. Despite, however, the reckless destruction of bluegum, mountain ash, messmate, blackwood, and beech, on the mesozoic sandstone ranges of the Southern District, and of ironbark and box on the central tablelands, Victoria is still the best wooded of all the Australian States. This, however, is obviously due to the extent of her mountain territory and average rainfall, and not to any protective action on the part of her people. The best forests of commercial value are now chiefly confined to the uplands and mountain slopes of the Eastern and South-Eastern Districts, but along the course of the Murray there are still valuable areas covered with redgum in all stages of growth; while in the Central District there are extensive tracts bearing healthy young messmate, box, and ironbark. One remarkable feature of settlement and the restriction of the destructive forest fires which used to burn for weeks without check is the gradual encroachment of thick belts of young timber on the lower slopes and foothills of the mountain

ranges. This is especially noticeable between Mount Wellington and the Snowy River, in the Otway District, and between the North-Eastern Railway and the head of the Ovens River. Where open forests of large trees once stood, a close and in many cases almost impenetrable growth of spar timber and saplings has taken their place. Again, where, within the memory of men still living, the country consisted of thinly timbered or bare grassy slopes, the surface is now completely covered with stringybark, box, and whitegum, and on the higher levels mountain ash. This extension of young forest is, of course, confined to districts with a regular rainfall, and, from a forester's point of view, it is not an unmixed benefit, since inferior trees of the stringybark family in many instances dominate and crowd out more valuable species.

It may be well to point out here that the natural reafforestation of grey and yellow box areas, and to a less extent of redgum, is greatly impeded by the maintenance of dual authority in connexion with forest grazing. The control of grazing in many valuable forests is still retained by the Lands Department, and exercised in a manner which often greatly injures them. Sheep especially eat greedily box seedlings and stool shoots, even when grass is abundant. They thus destroy all hope of obtaining regular hardy crops of natural growth. To this cause alone is due the absence of young pole timber in many of the valuable box forests, where rabbits are scarcely ever seen. Every endeavour has been made, but generally without avail, to put a stop to this senseless practice of sacrificing young forest growth to what is at best a small grazing revenue, and until the Conservator is given statutory power to regulate all grazing in the forests, there is no likelihood of proper control being conceded.

Many alarmist statements having been made by ill-informed persons that there is an increasing scarcity of timber of commercial value here, it is only right to correct this error. The supplies of useful hardwood, such as bluegum, spotted gum, blackbutt, mountain ash, messmate, stringybark, and peppermint, which, owing to the extension of railways, are now accessible, are probably greater than at any time since the beginning of settlement in the State. It is true that many areas of redgum, ironbark, and grey box are closed for a period of rest, the mature trees having been cut out, but on the other hand timber of the three kinds mentioned is used to a less extent than formerly, and is chiefly in demand for railway, harbor, and municipal works, where strength and durability are essential. Although the percentage of waste in conversion, owing to hollows or "pipes," is considerable, a large stock or redgum of fine quality is still obtainable in the Murray and other river reserves, while some sixty thousand acres of healthy young forest, with a stem diameter of six to twenty inches, is strictly protected. It is significant that last year, owing to the large supplies of redgum sleepers which were offered, the Railway Department was able to reduce its schedule price for this line material to 2s. 10d. a sleeper, a lower price than any in force for a long period. It is to be regretted that our

railway engineers will not consent to use bluegum in re-sleepering lines. Records which cannot be questioned show that in the early days of railway building here it was so employed, and proved to be durable. In Tasmania, with a wetter climate than Victoria, its average life in the track is about sixteen years. On a section of the Geelong to Ballarat line, bluegum sleepers cut near Apollo Bay are reported to have lasted about forty years. It is estimated that in one district alone nearly two million sleepers could be hewn from faulty trees of this species which the mills have passed by, and which are now going to waste. With regard to the supplies of hardwood in our mountain forests, such as the Upper Yarra and Otway reserves, when it is borne in mind that a sound mill tree of fair size will yield from 700 to 1,200 feet of sawn timber, and that many trees will give up to 1,500 feet, while the yield per acre in a good virgin forest varies from 20,000 to 50,000 feet to the acre, according to the species, it will be realized that a mill of ordinary size, cutting, say, from a million to a million and a half feet annually, makes very little impression on the standing crop at the end of a year's output. Taking, as a standard for yield per acre, trees such as mountain ash or blackbutt, which give a fairly mature crop in a rotation of sixty years, there are belts on the Yarra water-shed, in a reserve of 300,000 acres, which, under selection cutting, leaving many young immature trees standing, yield about 25,000 feet per acre, or an output of two and a half million feet from less than 100 acres. The yearly output of sawn timber from Victorian forests is, roughly, 18,000,000 super. feet, and of this quantity the Yarra and Otway reserves yield nearly 14,000,000 feet.

Victorian Timbers.

With respect to hardwoods which have a commercial value, Victoria has some twenty, all species of the eucalyptus family. In addition, there are about forty woods of fine grain, most of them, however, being trees of small size, and confined to a limited area in the deepest recesses of the hardwood forests. At the head of the latter, for size, beauty of grain, fitness for cabinet work, and general utility, stand the blackwood and evergreen beech. Both of these are now chiefly confined to creek valleys in the Otway Peninsula, Gippsland, and Wilson's Promontory. A description of the smaller timbers of fine grain would be beyond the limits of this short paper, but steps have lately been taken by the Forest Service to make a complete collection of them (as well as of the hardwoods), and a small handbook will also be issued setting forth their characteristics and the purposes for which they can be utilized. The hardwoods of Victoria are of a class well known in Australia and Tasmania, and have been in general use for all kinds of building and construction, as well as for railway lines, telegraphs, and harbor and bridge work, since the first settlement of the country. They may be divided into two main classes —in the first rank, for hardness, durability, toughness, and general utility, are redgum, red ironbark, white ironbark, grey box, bluegum, N.S.W. blackbutt or flintwood, yellow stringybark, and Gippsland mahogany; while in the second class may be placed spotted

gum, messmate, mountain ash, the three stringybarks, woollybutt, and bloodwood. In addition to these hardwoods and woods of fine grain, we have, among many inferior species, five acacias, which yield tanning bark of good quality, the most valuable being the golden or broad-leaf, and the black feather-leaf varieties.

Plantations and Nurseries.

In plantation work, and gifts of trees for shelter belts to small settlers, a great advance has been made during the past few years. State plantations are established near Geelong, Maryborough, and Creswick, and the experience thus gained in the propagation and growing of Australian hardwoods, as well as exotic conifers, has been of great benefit to the community. In addition to the young trees reserved for the plantations, from eighty to a hundred thousand transplants are distributed every year, the bulk of the stock being issued to farmers in the Northern district, State schools, and municipal councils. For plantation work, Victoria may be divided roughly into three main districts, the Northern, Midland, and Southern. In the Southern district, evergreen oaks, elms, planes, Himalayan and Californian cypresses, deodars, and Mt. Atlas cedars; hardy pines, such as pinus insignis, Canariensis, pinaster, laricio, and Austriaca; and eucalypts, such as the sugar gum, Gippsland mahogany, yate, and swamp mahogany, flourish. The same trees thrive fairly well in the sheltered areas of the central lowlands, while on the higher levels, silver and spruce firs, the Douglas fir, Californian redwood, and the mammoth sequoia show fair growth. It is, however, one thing to grow trees in a shrubbery or park, and quite another to plant them in close lines for the production of timber. Unquestionably, no eucalypt so far has given the State such uniformly good results for the latter purpose as the sugar gum, the timber of which, in its original home (South Australia), is in high repute for railway and harbor works and telegraphs. Among conifers, the handsome pinus insignis easily distances all rivals in height and stem growth. Of late years it has been propagated solely for shelter-belts, as its timber, although it affords material for interior construction and case-making, cannot compare with the better class of merchantable pines, or with the redwood of its native State. Its great utility here is as a shelter tree. It exhausts the soil in its neighbourhood, and should not be planted in or near a garden or orchard; but on the windward side of homesteads, outbuildings, or farmyards, it is a great protection. The Lambert and Lawson cypresses of California have also come into favour for shelter-belts and hedges in Gippsland and the Southern district generally. The former thrives even in the dryer climate of the Northern plains, its range extending eastward from St. Arnaud to the Goulburn. In the Northern district, owing to the irregular rainfall, and the desiccating winds of the summer season, the choice of trees for shelter and shade is very limited. At the head of the list stand the sugar gum and pepper tree, for loamy and clay soils, while the locust or false-acacia, the silky oak, and the white cedar or Pride-of-India come next. In saline soils in this region, the Aleppo pine, tamarisk, ailanthus, false-acacia,

and Moreton Bay fig have given the best results. Even to the extreme Northern limit of the State, no hardwood transplant equals the sugar gum, its one drawback being that, especially when planted out towards the end of winter, it is very sensitive to frost. It has now been propagated and grown here for some sixteen years, and as it has attained in the plantations in that period a girth of 35 to 40 inches, its hardy habit, quick growth, and comparative freedom from insect or fungoid disease, have amply justified its selection as a standard eucalypt. At one time the blue gum was extensively planted, too often without any regard to the climate and soil which suit it. On the plains of the central and coast districts it has not been a success. It is peculiarly liable to the attacks of wood-boring beetles, and so far there is no demand for its timber for mine-props; while, so long as box, ironbark, and red gum are available, the general public will not use it for fuel. Undoubtedly the blue gum is one of the finest of Australian hardwoods, but, as a whole, the plantation-grown trees of this species do not equal in the quality of their timber the natural growth in the forest reserves. Worked as coppice for the production of pole timber and fuel, blue gum in the plantations will yield, in a short rotation of 15 to 20 years, from seven to ten tons of dry fuel per acre per annum. The State has still fairly large areas of this timber, in the Otway Peninsula, North-Eastern reserves, Gippsland, and Mt. Cole. The belts of limestone country which form the sea-front to the Southern Ocean have a climate of their own, and here, owing to the prevalence of strong south-westerly winds, only the hardiest trees suited to calcareous soils flourish. Among conifers may be mentioned the handsome Norfolk island pine, the Lambert cypress, and the Aleppo, Austrian, and Cluster pines. Among Australian trees, the erect and drooping varieties of sheoak rank first, as they not only furnish shelter and shade, but also yield excellent fuel. Next to these, come the *Zagunaria* of Queensland, the local Boobyalla, and the coastal wattle (*acacia longifolia, var. sophorae*). The latter, in conjunction with marram grass, is also a most valuable sandstay on the dunes.

The plantations established during the past twenty-five years must be regarded as, to a large extent, experimental. The choice of the Monterey pine (*p. insignis*) as the standard conifer for the production of softwood while trees, such as the Douglas fir (Oregon pine), the pitch pines of America, the Californian redwood, and the Corsican pine were neglected, was unwise, for the reason, among others, that it has caused the loss of so long a period of growth of the more valuable species. The further mistake made of planting conifers twelve feet apart, which resulted in broad-crowned trees with strong lateral branches, thus greatly weakening the timber by excess of knots, and retarding the free development of stem-growth, has been avoided in later work, close planting being now the rule. Even in the growth of such useful trees as the white willow, Carolina and Canadian poplars, basswood, and tulip tree, which will flourish in many parts of Victoria, and furnish a light, tough timber useful for furniture, parts of vehicles, and box-making, nearly a generation

of time has been lost. Happily, during the past few years steps have been taken to test the growth of such trees as these. Many of our hardiest eucalypts are now sown broadcast, instead of being raised in nursery lines and put in their permanent sites as transplants, but this method, of course, involves the thorough working of the soil to a fine tilth. Where transplants of such trees as sugar gum are used, the best results have been obtained by laying down properly prepared nursery beds at the plantation, and raising the young trees on the spot.

Planting or sowing is costly, and in the case of indigenous trees, is only advisable at present on open or denuded lands, where there is no tree growth. To remove useful forest growth, native to the soil, and plant inferior exotics in its place is simply folly, and a very expensive folly in the long run. The first cost of laying down a plantation ranges from £2 to £3 10s. an acre, and the maintenance expenses are afterwards heavy. The area chosen must not only be substantially fenced, but also wire-netted, to prevent the ravages of rabbits and hares, and this netting is a serious item when a large tract has to be enclosed. It is sound policy to encourage plantations of conifers which yield timber of good quality, but as regards our own eucalypts, the hardiest and most vigorous trees are those which spring up from seed in the natural forest. Artificial re-stocking in these forests is not necessary, as by light thinnings and cleanings, valuable young crops can be greatly improved at less than a quarter of the cost of raising them in plantations, while on denuded areas healthy germination can nearly always be obtained from dormant seed after the surface has been fired at the proper season. As regards the raising of trees for general distribution, Macedon has not been happily chosen as a site for a general nursery. It has defects of soil, subsoil, and situation which unfit it for the early production of transplants for the Northern district, and also for the raising of deciduous trees. The sugar gum especially is a standard tree for the Northern district, and it is difficult to raise it open-root at Macedon, and then transport it safely to any distance, while, in addition, the young trees of this species are not ready to issue for autumn planting. This difficulty does not exist with seedlings for forest plantations, as they can be raised locally open-root in properly prepared beds, and quickly transferred to their permanent sites. Some little time ago the writer chose a site for a new nursery near Bendigo, with the view of raising there all trees required for the Northern plains, and thus reducing the cost of upkeep at Macedon. The place chosen has a strong, useful soil and subsoil, and has the Coliban water supply near it. The early opening of this nursery will enable the department to raise a much larger quantity of tree plants at a low cost, and will be a first step to the laying down of plantations northward of Bendigo.

Tree Plants for Settlers.

As regards grants to small settlers, it has been the aim of the State to encourage by a generous distribution of useful transplants,

the growth of trees around homesteads for shelter and shade. The fact that settlers too often wantonly destroy valuable forest in preparing their land for tillage and pasture is to be deplored, but they will only be brought to recognise their error by seeing the benefit derived from planting even a few useful trees to protect their homes, as well as live stock, from stress of weather. The demand for shelter trees is greater than the State nurseries can meet, and issues to farmers are now chiefly confined to quick-growing eucalypts, pepper trees, and hardy pines. The annual grant of trees has greatly improved the appearance of homesteads on the Northern plains and in other treeless districts, and so long as it is confined to struggling farmers who could not afford to purchase plants from private nurseries, no reasonable objection can be urged against its extension.

Climatic Effect of Tree Denudation.

There is another aspect in regions formerly well-wooded which must not be lost sight of. As settlement creeps up from the plains denudation of tree cover goes on apace. The American wood-lot, the strip or belt of live timber which is so marked a feature on farms in the North-eastern States, and even in Quebec and Ontario, is scarcely ever seen in Victoria. Here the axe is set to every tree, and often not a shrub is left for shelter or shade. In summer the cattle and sheep vainly seek restful shade. The dam or creek has no cover from the fierce rays of the sun. Evaporation quickly empties the stock supply, which under dense canopy might well outlast any ordinary summer. Around the homesteads may be seen a few sickly pines, keeping the air from the living-rooms, and ruining the soil of the small garden enclosures, but the stockyards and outbuildings are left unsheltered. Often on bleak winter evenings the writer has seen dairy cattle shivering near naked homesteads, vainly trying to escape from the driving rain, while in the paddock hard by native trees, which would have afforded warmth and shelter, stood leafless and dead. What this neglect of shelter means to the dairyman in shrinkage of milk supply is only now being realized. Even in sheep paddocks the same neglect of cover commonly prevails. One of the earliest settlers on the plains of the Western district some twenty-five years ago determined to plant shelter-belts on his property, choosing, under advice, blue gums, with outside hedges of kangaroo acacia, Osage orange, and boxthorn. The protected hedges gave warm cover, but the blue gums, with their bare poles and their open crowns, afforded but little shelter, and were gradually used for fuel, and replaced with sugar gum and Monterey or Aleppo pines. It was soon found that the flocks kept in the paddocks provided with windbreaks not only kept in better condition than the rest, but that the clip of wool obtained from them materially improved in staple and weight. The experiment was soon followed by neighbouring owners, and to-day the strip of country referred to, between Skipton and Yally-a-poora, although thinly and partially planted, is in marked contrast with the bareness of the neighbouring plains.

But the benefit of shelter-belts is not confined to sheep and cattle. Their influence on standing crops must not be undervalued. In the Portland district there are stretches of limestone land, mixed with sandy loam, which 40 years ago yielded over 50 bushels of wheat to the acre, but which now, even with careful tillage, and the strongest manures, will scarcely yield a poor crop of rye. The live timber between these farms and the coast line has been destroyed, and harsh sea winds laden with salt prevent the healthy growth of cereals. Nor is this a solitary instance of deterioration of climate in our State following denudation. In the Ballarat district there are rich uplands where the peach and apricot flourished and yielded heavy crops about a generation ago. Now, in the same soil, the face of the country being denuded for miles, even the hardiest fruits cannot be grown with success. On the northern slopes of the main Divide westward of Woodend, where the soil is a red volcanic loam, the destruction of timber round the holdings has made it difficult to raise crops of pulse, where heavy yields were once the rule, while the yields of oats and potatoes vary greatly according to whether the fields are protected or not by belts of the neighbouring forest. Moreover, it is admitted by the settlers themselves that the naked stretches of country are subject to severer frosts, and it is a common sight to see potato lands in the open burnt up from this cause, while well-sheltered fields are scarcely touched.

How, it may be asked, can the people of this country be brought to see that their true interest and profit in farming and grazing lies in planting, or in preserving shelter-belts of trees on the weather side of their holdings. Some of the American States strive to attain this object by granting a lower scale of municipal taxation to holdings where tree cover is systematically maintained. Such a law in Victoria could not well be of general application, since our climate and rainfall varies so much. Even at this day, in Gippsland and the North-eastern district there are long stretches of valley and hill country occupied by settlers where thorough clearing is necessary in order to get the benefit of sunlight and heat for the growth of cereals and grass. But such districts are the exception, and the fact remains that unwise destruction of useful timber goes on throughout this State without legislative check or control. The Department of Public Instruction has, in a tentative way, taken up the subject of tree-planting at the schools, but judging from the condition of the young trees in many school reserves, much has yet to be learnt in the matter by teachers and scholars alike. It is questionable whether any marked advance in forest protection will be achieved by appealing merely to sentiment in the minds of children. By bringing home to the minds of parents the common-sense view that it is their interest to protect all healthy or useful tree growth on their lands, and by putting before them in a simple and attractive form the elementary truths of forestry, much more is likely to be gained, and this work, which properly belongs to the Forest Department, has been taken in hand.

Legislation Essential.

Now that the systematic working of the reserves has been authorized, the necessity for a controlling law is more than ever apparent. Three things are essential to the maintenance of the forest domain of this State: an Act of Parliament, conferring large powers of management and control on the executive officers; a detailed survey and delimitation of the permanent reserves; and the framing of working plans to insure proper exploitation. A commencement has been made by the writer with these plans, but unless the reserves are protected from alienation by law, and provision is made in the Act for their strict enforcement, all the care taken in their preparation will be simply wasted labour. In this matter, Victoria is singularly backward, not only in comparison with the best-governed States of Europe, but even with Turkey, which, since the year 1870, has had a useful forest law. Many of the States of the American Union, the provinces of Canada, and the Cape Colony, have recognised the necessity of such a law, and have made provision accordingly, while Japan has not only framed and put in force such legislation, but controls her forests on the most conservative lines, and by liberal assistance and encouragement has, during recent years, secured the training of her most promising executive officers in the best schools of Germany and France.

One of the first duties to be taken in hand, and steadily pursued till the work is complete, is a timber survey of the State, which will record, with precision and fulness of detail, the distribution of species, condition and fitness for conversion, and average yield per acre, of the tree-growth in all the reserves. This survey is especially necessary in remote forests which are not yet recorded in any working plan, so that future exploitation may be on a safe basis. In any undertaking of mill associations to build up an export trade, not only secure tenure, but the assurance of unfailing supplies is necessary. Now that British, South African, East Indian, Chinese, and Philippine railways are using Australian hardwood for sleepers, and supplies of timber true to name in some of the States of this group cannot be depended on, it should not be difficult for shippers to foster an export trade in railway and building timber from this State.

Forest Training.

In 1902 the writer drew up a scheme for the creation of a Forest School at Macedon, with the object of giving the protective staff, together with pupil foresters who might enter as recruits from time to time, a regular course of instruction in forestry as well as in nursery and plantation work. Although only £500 a year was asked for as a grant to meet the cost, the severe economy exercised at the time in State finance prevented its adoption, and after the entry of one pupil (who has since been successful in passing excellent examinations in botany, geology, and general forestry), the work was perforce abandoned for a time. Now that public funds are set aside for the

advancement of forestry, one of the first things to be taken in hand should be this school. As a first condition the scheme provides that all applicants for entry as pupil foresters must pass a searching physical test, and also be successful in a competitive examination in botany, geology, chemistry, French or German, and theoretical forestry. The course of study for those who are successful extends over two years, and embraces geometrical and freehand drawing, surveying, geology, and mineralogy, chemistry, physics, botany, entomology, with theoretical and practical forestry, and one modern language, either French or German. The proficiency of candidates is to be tested by half-yearly examinations, and it is intended that at the end of the second year, a "pass" or "pass with credit" certificate shall be issued to those who are successful, which will qualify them for forest employment. At the same time the school should prove an admirable training ground for the foresters on service, who desire to improve their technical education, or to qualify for promotion. It is unfortunate that Dookie, the chief agricultural school of the State, is distant from any tract of natural forest. It is essential that pupils in forestry should have the advantage of practical training in the work which lies before them. Hence the science classes at Dookie could not well be utilized, and the classes would best be concentrated at Macedon, as that place has suitable buildings and appliances available, and also has Wombat State Forest for practical work in the immediate vicinity.

There is another means by which useful information on the general subject may be given to the staff, as well as the public, and which may be alluded to here. Towards the end of last year the writer made arrangements with the late Director of Agriculture for the monthly publication of a Forestry Division under the covers of the *Journal of Agriculture*. Contributions were not to be limited to Victoria, and the list of writers proposed included some men with special knowledge in neighbouring States. A Notes and Queries column for the dissemination of information on minor points of botany, entomology, and sylviculture was also provided for. This project would have cost little, as copies would have been subscribed for in the other States, and we should soon have had, fully established, a really useful journal of Australian forestry. The arrangement, however, has not been carried out, owing to changes in the control of the department, and as a consequence the journal required for the Australian forest service will probably be established shortly in Sydney.

A great responsibility rests on the Executive and Parliament of Victoria to provide the administrative powers which are absolutely necessary if the forests are to be preserved from irreparable injury. Apart from the question of timber altogether, it must never be forgotten that the forest governs the water supply. In this country, subject to extremes of drought and flood, the protection of the mountain watersheds should be a public duty of the first importance. But, while very large sums of money have been spent—and lost—by the State in subsidizing irrigation trusts on the lowlands and plains, but little foresight has been exercised, or care shown, to protect from

alienation lands at the head of streams and springs, which, in Europe or North America, would be carefully retained under forest cover, since they, and they alone, feed the rivers which supply the irrigation channels. It may be conceded that cycles of drought probably occurred in South-eastern Australia before the axe of the settler touched a forest tree, but while great periodic rains are doubtless due to complex laws affecting ocean and air currents, the influence of large masses of live timber, on local rainfall, cannot be gainsaid. The writer has on many occasions observed a marked diminution in the rainfall over bare plain country, as compared with that on a forest-clad portion of the same plain, and has seen it raining heavily over inland forests scarcely above sea-level, while the surrounding country escaped even light showers. Moreover, as tests made with the rain gauge *under similar conditions* bore out these observations, the difference cannot be attributed to the absorptive property of cultivated soil, or to any marked elevation above sea-level. As regards the influence on local rainfall of forests on the crests and slopes of mountain ranges, this is usually admitted, even by those investigators who question or deny that forests have any marked influence in determining the climate and general rainfall of a country.

The Weather of the Year 1904.

By P. Baracchi, Esq., Government Astronomer.

General. The first two months of the year were remarkable for the excessive amount of rain and the abnormally large number of wet days which interfered with, and retarded, harvest operations; for the relatively low temperatures which gave to the hottest period of the year the character of the Autumn season; and for the frequency and severity of thunderstorms and gales which swept over the State, causing considerable damage to property. The worst thunderstorms occurred during the latter half of January, and the worst gales at the beginning of February. Snow was reported from the eastern highlands towards the end of January. At Melbourne 5.53 inches of rain were registered in the first month of the year, the average for which is 1.88 inches. The wettest January on record at Melbourne in any year previous to 1904 was that of 1897, when 5.46 inches of rain fell.

Fine, dry, pleasant weather was experienced throughout the month of March and the first half of April. By this time the country was in great need of rain, as the delay in commencing operations owing to the dryness of the soil, was now becoming discouraging. Fortunately a good general rainfall came shortly after the middle of April.

For the greater part of May, fine, mild Autumn weather prevailed; but at about the 23rd May the first snow of the season fell on the eastern ranges, also at Ballarat, and in the Colac district, after which date the weather suddenly assumed its winter characteristics.

In the winter months some periods of intense cold and more than usually frequent frosts were experienced in the northern plains, and in the lower intermediate districts between the coast and the dividing range. There was a prevalence of strong south-westerly gales along the coast. A violent storm raged in the north-eastern districts on 16th July, and was very destructive at Avenel, where it damaged several buildings, and caused the deaths of two persons. But in general, this season was favorable to country interests, and the agricultural outlook at the beginning of August was generally good. Atmospheric disturbances and intense weather changes prevailed throughout the month of September. This month commenced with general heavy rains, and snowfalls over the eastern ranges and south-eastern districts. The Moe swamp and the Carrum swamp were flooded. During the latter half of the month strong south-westerly gales were of frequent occurrence on the coast, and exceptionally cold weather prevailed inland, with severe frosts, and snow at many places in the elevated localities. The October rains fell almost entirely in the first half of the month, after which the prospects of a good harvest were assured. The weather during this month, and up to the middle of November, was, however, subject to violent disturbances. Many parts of the State were visited by destructive thunderstorms, gales, and hailstorms. One of these occurred in the Warracknabeal district, where rabbits and geese were killed by hailstones. Very little rain fell after the middle of November. Hot, dry weather set in at this time, and continued till the end of the year.

During this period exceptionally high temperatures were registered, and even the highest thermometer reading on record in this State was exceeded. The previous highest record for any place in Victoria in any year was 120 degrees F., and the maximum temperature of air in shade registered at Mildura, on the 30th December, 1904, was 121·5 degrees F. The year ended with a veritable heat wave, and bush fires, which commenced early in the month, had by this time extended over many localities, and assumed a most alarming aspect.

The rainfall.

Regarding the State as a whole, the total amount of rain of the year 1904 was 3.40 inches, or nearly 13 per cent., below average. The only localities where the average was reached or surpassed were the districts around Mount Elephant and Lake Corangamite, the basins of the Yarra River and Dandenong Creek, and the Koowee-rup Swamp, where the excess over the average was respectively 6 per cent., 17 per cent., and 4 per cent. On the other hand, the greatest deficiency is found in the Gippsland districts, extending over the basins of the Macallister, the Avon, the Mitchell, the Tambo, and the Nicholson Rivers, where the total rainfall of the year was from 28 to 35 per cent. below average.

Next in order of relative dryness come the Mallee country, with a deficiency of 24 per cent., the Murray districts, and the Wimmera, with a deficiency of from 21 to 18 per cent.; the basins of the Ovens, the Snowy, the Avoca, the Richardson, the Werribee, the Saltwater, the Glenelg, and the Wannon Rivers, with a deficiency of from 17 to

14 per cent.; the basins of the Loddon, the Fitzroy, the Eumerella, and the Merri Rivers, and South Gippsland, with a deficiency of from 12 to 10 per cent.; the basins of the La Trobe, the Thompson, the Goulburn, and the Campaspe Rivers, and the Otway Forest, with a deficiency of from 8 to 5 per cent.; and finally, the basin of the Moorabool, the Barwon, the Hopkins, the Mitta Mitta, and the Kiewa Rivers, and Mount Emu Creek, where the annual rainfall was only from 3 to 1 per cent. below average.

As regards the seasonal distribution of the total amount of rain of the year, the most noteworthy characteristics are as follows:—

The first quarter of the year.

The rainfall of this quarter was remarkably excessive over the greater part of the State, and the only locality which experienced relatively dry weather during this period was the basin of the Ovens River, where a deficiency of 24 per cent. below average was registered.

The greatest excess was 153 per cent. above average over the basins of the Yarra River and Dandenong Creek; and the least, 7 per cent. above average, in the Murray Districts. The average rainfall was exceeded to the extent of from 104 to 131 per cent. over the basins of the Moorabool and Barwon Rivers, the districts around Mount Elephant and Lake Corangamite, the Koo-wee-rup Swamp, and the Otway Forest; from 65 to 85 per cent. over the basins of the Avoca, the Avon, the Richardson, and the Campaspe, the basins of the La Trobe, the Thompson, the Werribee, the Saltwater, and the Hopkins Rivers, the basin of Mount Emu Creek, and South Gippsland; from 42 to 56 per cent. in the Mallee country, in the eastern areas of the Wimmera, and over the basins of the Loddon, the Goulburn, the Fitzroy, the Eumerella, the Merri, the Glenelg, and the Wannon Rivers; 26 per cent. on the western areas of the Wimmera; 23 per cent. over the basin of the Macallister River; 17 per cent. over the basin of the Mitchell River; 14 per cent. over the basins of the Mitta Mitta, the Kiewa, and the Snowy Rivers, and 10 per cent. over the basins of the Tambo and Nicholson Rivers. Nearly the whole of these excessive rains fell during the first six weeks of the year, and were the consequence of an exceptional prevalence of heavy thunderstorms.

The second quarter.

Rains of this quarter were below average throughout the State; but the deficiency was to a very great extent compensated by the fortunate circumstance that most of the total amount fell soon after the middle of April, when the country was in the greatest need of moisture. The average rainfall for the quarter was reached only over the basins of the Yarra River and Dandenong Creek. There was only a slight deficiency of from 9 to 14 per cent. in the Western districts, extending over the basins of the Hopkins, the Eumerella, and the Merri Rivers, the Koo-wee-rup Swamp, and the basin of Mount Emu Creek.

The deficiency ranged from 18 to 23 per cent. below average in the districts around Mount Elephant and Lake Corangamite, the Otway Forest, and over the basins of the Glenelg, the Wannon, the Moorabool, the Barwon, the Snowy, the Mitta Mitta, the Kiewa, the Campaspe, and the Loddon Rivers; from 25 to 28 per cent. below

average over the basins of the Wimmera, the Avon, the Richardson, the Goulburn, the Ovens, the La Trobe, the Thompson, the Werribee, and the Saltwater Rivers; from 31 to 36 per cent. below average over the basins of the Avoca, the Tambo, and the Nicholson rivers, the greater part of South Gippsland, and the Mallee country; from 41 to 43 per cent. in the Murray districts, and over the basin of the Mitchell river; and finally 63 per cent. below average over the basins of the Macallister and Avon Rivers, which were relatively the driest regions at this period of the year.

The third quarter.

The rainfall of the third quarter exceeded the average to the extent of from 9 to 16 per cent. over the basins of the Mitta Mitta, the Kiewa, the Snowy, and the Yarra Rivers, and the basin of the Dandenong Creek, but it was below average in every other part of the State. The deficiency was only from 2 to 6 per cent. below average over the basins of the Loddon and the Goulburn, and the Campaspe rivers, and in the districts around Mount Elephant and Lake Corangamite; from 10 to 15 per cent. below average over the basins of the Hopkins River and Mount Emu Creek, the Koo-wee-rup Swamp, the basins of the La Trobe, the Thomson, the Mitchell, the Ovens, the Avoca, the Richardson, and the Avon rivers, and the Murray districts; also from 16 to 20 per cent. below average in the Otway Forest, in South Gippsland, in the eastern areas of the Wimmera, and over the basins of the Moorabool and the Barwon rivers; and lastly from 24 to 30 per cent. in the Mallee country and Western Wimmera, and over the basins of the Tambo, the Nicholson, the Macallister, the Avon, the Werribee, the Saltwater, the Fitzroy, the Eumerella, the Merri, the Wannon, and the Glenelg rivers.

The last quarter.

The rains of the last quarter of the year were below average over the whole of Victoria, and the deficiency was considerable, and even great, in many parts, more especially in Eastern Gippslnd. The nearest approach to the average was recorded in the Mitta Mitta and Kiewa districts, where the deficiency was only 3 per cent. Less than one-half the average rain of the quarter was registered over the basins of the Macallister, the Avon, the Mitchell, the Tambo, the Nicholson, and the Snowy rivers, the basins of the Werribee and Saltwater rivers, and the basin of the Avoca River, in all of which regions the deficiency was greatest, and ranged from 50 to 60 per cent. below average. There was a deficiency of from 13 to 16 per cent. in the Murray districts and Western Wimmera, and over the basins of the Goulburn and the Ovens rivers; from 18 to 27 per cent. below average in South Gippsland, in the Koo-wee-rup Swamp, and over the basins of the La Trobe and Thomson rivers, in the Otway Forest, in the districts around Mount Elephant and Lake Corangamite, over the basin of Mount Emu Creek, and the basins of the Hopkins, the Glenelg, and the Wannon rivers; and lastly a deficiency of from 30 to 39 per cent. over the remaining districts, comprising the Mallee country, Eastern Wimmera, and the basins of the Avon, Richardson, Loddon, Campaspe, Yarra, Barwon, Moorabool, Merri, Eumerella, and Fitzroy rivers, and Dandenong Creek.

It will be seen from this account that the behaviour of the rains in the last quarter of the year resembled that of the second. The

totals for each of these two periods were everywhere in the State below average, and the deficiency was great in many parts, especially in Eastern Gippsland, but fortunately, again, most of the spring rains fell in the months of October and September, and were sufficient to satisfy the needs of the country at one of the two most critical times of the year, the turning-point which determines the success or failure of the season. This is another instance, therefore, which may be pointed out to students of rainfall statistics, as showing how important it is to analyze and to give due weight to the distribution of rainfall at different periods of the year before drawing conclusions from the mere totals and averages of the year, or even of the quarters.

A detailed tabular account of the rainfall of the year 1904 is given in a previous part of this work. In the small table following, the records from some 850 stations are grouped and summarized, so as to show in a concise form the amount and distribution of rain over the principal subdivisions of the State during each quarter of the year, and the percentage above or below the corresponding average, based on all available records of past years:—

Basins.	First Quarter.		Second Quarter.		Third Quarter.		Last Quarter.		Year.	
	Amount of Rainfall recorded.	Percentage above or below Average.	Amount of Rainfall recorded.	Percentage above or below Average.	Amount of Rainfall recorded.	Percentage above or below Average.	Amount of Rainfall recorded.	Percentage above or below Average.	Amount of Rainfall recorded.	Percentage above or below Average.
	in.		in.		in.		in.		in.	
Glenelg and Wannon Rivers ..	4.82	+41	7.07	−18	7.35	−26	5.03	−22	24.27	−15
Fitzroy, Eumerella, and Merri Rivers	5.63	+49	8.29	−14	8.23	−24	4.87	−34	27.02	−12
Hopkins River and Mount Emu Creek	6.64	+79	7.31	− 9	7.24	−10	5.03	−26	26.22	− 2
Mount Elephant and Lake Corangamite	8.01	+111	6.14	−17	7.16	− 4	5.54	−18	26.85	+ 7
Cape Otway Forest and South Coast	9.69	+104	9.66	−23	11.62	−17	6.72	−27	37.69	− 7
Moorabool and Barwon Rivers	8.69	+109	6.22	−20	6.52	−16	4.56	−35	25.99	− 3
Werribee and Saltwater Rivers	8.84	+ 85	5.65	−27	4.98	−32	3.69	−50	23.17	−15
Yarra River and Dandenong Creek	14.03	+153	9.71	0	10.80	+10	6.38	−35	40.92	+17
Koo-wee-rup Swamp	11.93	+131	9.05	−14	9.50	−13	7.16	−26	37.64	+ 4
South Gippsland	9.99	+ 65	8.11	−31	9.84	−20	7.87	−23	35.81	−11
La Trobe and Thomson Rivers	9.40	+ 65	7.61	−25	9.62	−12	8.77	−23	35.40	− 8
Macallister and Avon Rivers ..	7.32	+ 23	2.47	−63	4.24	−30	3.42	−59	17.45	−35
Mitchell River	7.85	+ 17	4.49	−43	6.17	−15	3.48	−61	22.09	−28
Tambo and Nicholson Rivers ..	6.82	+ 10	5.09	−34	5.73	−30	3.65	−55	21.29	−30
Snowy River	8.88	+ 14	7.56	−23	10.55	+16	4.18	−60	31.17	−16
Murray River	4.80	+ 7	4.52	−41	6.09	−11	5.13	−14	20.54	−18
Mitta Mitta and Kiewa Rivers ..	7.01	+ 14	9.06	−19	11.32	+ 9	8.31	− 3	35.70	−1½
Ovens River	5.09	+ 24	9.97	−25	12.54	−10	9.05	−13	36.65	−17
Goulburn River	6.11	+ 45	6.27	−27	7.85	− 4	6.13	−13	26.36	− 6
Campaspe River	7.08	+ 75	6.41	−23	7.33	− 6	4.55	−30	25.37	− 5
Loddon River	4.52	+ 47	5.03	−23	5.33	− 2	3.42	−36	18.30	−10
Avon and Richardson Rivers ..	3.72	+ 65	4.06	−26	4.25	−14	2.74	−39	14.77	−14
Avoca River	3.81	+ 64	4.12	−36	4.57	−12	2.72	−50	15.22	−21
Western Wimmera	2.80	+ 26	4.91	−28	5.18	−30	4.56	−16	17.45	−20
Eastern Wimmera	4.25	+ 56	5.73	−27	6.08	−18	4.10	−38	20.16	−18
Mallee Country	2.73	+ 42	3.32	−36	3.26	−27	2.86	−35	12.17	−24
	5.83	+ 46	5.89	−26	6.76	−13	4.80	−30	23.28	−12

Temperature.

The frequency of thunderstorms, gales, and heavy rains which prevailed during the first six weeks of the year 1904 mitigated the temperatures of this period, and rendered the summer heat moderate almost throughout the State. Frosts and snow were recorded in January, and the highest thermometer readings in January, February, and March were generally about 10 degrees Fahr. below the extremes on record for the months. In the early autumn and up to the last week of May fine and mild weather prevailed, with temperature slightly above the average. Cold weather set in suddenly towards the end of May. During the winter months short spells of intense cold were experienced in the northern plains, where low temperatures were registered from 2 to 5 degrees below the lowest readings on record for these localities. In the coastal districts, on the contrary, the winter temperatures were generally higher than the average, and remained from 4 to 11 degrees above the extremes of the coldest years. The lowest temperatures on record for the highlands is 17 degrees in June and July, but the minimum temperatures registered in the year 1904 were from 6 to 8 degrees higher. In the intermediate districts, the extreme cold of winter was experienced in May and August, when the minimum temperatures, especially in the north-eastern areas, fell as low as, or slightly lower than, the lowest reading of any previous winter. The month of September was colder than in average years, more especially towards the end of it, when heavy falls of snow and frosts were reported from many places. The October temperatures did not deviate from the average value to any great extent. Hot weather set in shortly after the middle of November, and continued throughout the month of December with increasing severity, culminating at the end of the year with a phenomenal heat wave. On this occasion the thermometer rose to 121½ degrees Fahr. at Mildura on 30th December, which is the highest reading ever recorded in the State. The maximum and minimum temperatures of the summer and winter months of the year 1904, together with the corresponding extreme values recorded in any previous year, are briefly summarized in the following tables:—

Table Giving the Highest Temperatures of Air in Shade,

For the five warmest months of the year 1904, and the extremes on record for the corresponding month:—

Region.	Highest Readings in 1904.					Extremes on Record.				
	Jan.	Feb.	Mar.	Nov.	Dec.	Jan.	Feb.	Mar.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°
Eastern Ranges ..	..	..	..	70.0	86.0	94	89	78	80	86
Highlands	87.0	89.0	83.0	84.0	102.0	108	107	103	101	105
Coast	96.0	96.0	85.0	89.0	93.0	109	105	105	103	105
Intermediate Dists. ..	100.0	99.0	96.0	92.2	111.5	111	110	106	106	112
Northern Plains ..	110.0	111.0	111.0	104.0	121.5	120	120	115	112	115

TABLE SHOWING THE LOWEST TEMPERATURE OF AIR AT NIGHT,

For the four coldest months of the year 1904, and corresponding extremes on record :—

Region.	Lowest Temperature in 1904.				Extremes on Record.			
	May.	June.	July.	August.	May.	June.	July.	August.
	°	°	°	°	°	°	°	°
Eastern Ranges ..	18.0	22.0	24.0	22.0	17	16	17	19
Highlands ..	28.0	23.0	25.0	22.0	18	17	17	19
Coast	35.0	38.0	32.0	35.0	31	27	27	30
Intermediate Districts	25.0	26.0	27.3	27.0	27	24	24	27
Northern Plains ..	23.0	23.0	21.0	24.0	28	25	23	24

THE MELBOURNE CLIMATE.

The values of the climatic elements registered at the Melbourne Observatory in the year 1904 are given in Table I. and IA.

The corresponding values showing the average and extreme conditions of the Melbourne climate deduced from the records of nearly half a century are exhibted in Table II. A comparison of these two tables indicates the following general characteristics of the season of the year under review :—

Atmospheric pressure.

The mean pressure of air for the year 1904 was equal to that of average years. The mean pressure of air for each month remained throughout within 0·12 inches of the average, being from 0·07 to 0·10 inches above in April and July, from 0·06 to 0·12 inches below in January, February, and June, and within 0·03 inches in the remaining months.

The lowest reading for the year was 29·195 inches, and the highest 30·475 inches, which gives a maximum range of 1·280 inches.

The corresponding extreme values on record are as follow :—

Lowest air pressure registered in any year, 28·868 inches.

Highest air pressure registered in any year, 30·678 inches.

Greatest annual range, 1·709 inches.

Temperature.

The summer was relatively cool, the mean temperature of January, February, and March being from 2 degrees to 4 degrees below average.

The only period of intense heat was experienced in December, when a great heat wave swept over the State, and the thermometer rose on one occasion to 102 degrees F., the highest record of the year.

During the five warmer months, viz., January, February, March, November, and December, the average temperature in the hottest part

of the day ranged from 68·3 degrees in March to 78 degrees in December. It rose above 100 degrees only once, above 90 degrees eleven times, six of which were in December, and above 80 degrees twenty-five times. At night the thermometer remained on a single occasion above 70 degrees, and twenty-one times above 60 degrees.

The mean temperature of air in the three coldest months, June, July, and August, was equal to that of the corresponding months of an average year. The average maximum temperature of the day was from 55 degrees to 58 degrees F., and the average lowest temperature at night was from 43 degrees to 45 degrees F. The thermometer never failed to exceed 50 degrees in the day, and fell below freezing-point on a single night, on which 31·5 degrees was registered, this being the lowest temperature recorded in the year.

In the more temperate months of April, May, September, and October we find the mean temperature 2 degrees above the average in April and May, during which the weather was exceptionally fine and mild; and 3·3 degrees below average in September, which was a month of comparatively very cold and considerably disturbed weather; and only a small fraction of a degree within the average in October, which was a normal month.

Rainfall.

The months of January and February were abnormally wet. Two-fifths of the rain of the whole year fell in its first six weeks, and was the heaviest recorded for the like period in any previous year since 1856.

Rain was also excessive in the months of June and August, and differed only slightly from the average in May, July, and October; but the months of March and April were very dry, and hardly any rain fell during December.

There were 128 wet days in the year, or four days below the average number. The total rainfall amounted to 29·72 inches, which is about 4 inches above the average of 49 years.

Winds.

The number of hours during which the wind blew from each of the eight points of the compass will be found in Table I. These numbers show that wind blew—

From the North, 16 per cent. of the total number of hours in the year.

From the North-west, 8 per cent. of the total number of hours in the year.

From the West, 15 per cent. of the total number of hours in the year.

From the South-west, 14 per cent. of the total number of hours in the year.

From the South, 14 per cent. of the total number of hours in the year.

From the South-east, 10 per cent. of the total number of hours in the year.

From the East, 5 per cent. of the total number of hours in the year.

From the North-east, 11 per cent. of the total number of hours in the year.

Calms, 7 per cent. of the total number of hours in the year.

North winds were most frequent in May, June, July, and August.

South winds were most frequent in January, February, March, and December.

East winds were most frequent in April and December.

West winds were most frequent in June, September, and November.

Also intermediate land winds from the N.W. and N.E. quadrants were most frequent in May, July, and August, and intermediate sea winds from the S.W. and S.E. quadrants were most frequent in January, February, March, and December.

In the warmer months of the year, January, February, March, November, and December, which contain 3,648 hours, cool sea winds proponderated over the warm land winds in the following proportions:—

Duration of cool sea winds, 2,705 hours, or 74 per cent. of the whole number of hours in the five warm months.

Duration of warm land winds, 686 hours, or 19 per cent. of the whole number of hours in the five warm months.

Duration of calms, 257 hours, or 7 per cent. of the whole number of hours in the five warm months.

The above conditions were reversed in the colder months, May, June, July, and August, when the land winds preponderated over the sea winds thus:—

Duration of sea winds from the S.W. and S.E. quadrants, 1,215 hours, or 41 per cent. of the 2,932 hours comprised in the four colder months.

Duration of land winds from the N.W. and N.E. quadrants, 1,539 hours, or 52 per cent. of the 2,932 hours comprised in the four colder months.

Duration of calms, 198 hours, or 7 per cent. of the 2,932 hours comprised in the four colder months.

In the remaining months of April, September, and October, which contain 2,184 hours—

Sea winds from the S.W. and S.E. quadrants blew for 1,200 hours, or 55 per cent. of the total number of hours.

Land winds from the N.W. and N.E. quadrants blew for 815 hours, or 37 per cent. of the total number of hours.

Duration of calms, 169 hours, or 8 per cent. of the total number of hours.

The most remarkable feature of the winds of the year 1904 was the occurrence of gales of unusual violence and frequency during the months of February, July, August, September, and November.

Sunshine.

The number of hours recorded in each month of the year 1904, during which the sun was not covered by cloud while it remained above the horizon of Melbourne, and the mean daily duration of bright sunshine obtained by dividing the said number of hours by the number of days in each respective month, are shown in Table I. On comparing these with the corresponding average and extreme values given in Table II., we find that the actual duration of bright sunshine was greater than the average in the months of April, May, October and December; approximately equal to the average in June, July, September, and November; and less than the average in the remaining months—January, February, March, and August; the excess in the first case being 15 per cent., and the deficiency in the last case 16 per cent. The duration of bright sunshine in the various months varied from a minimum of 80 hours 13 minutes for June, the shortest month, to a maximum of 264 hours 53 minutes in December, the longest month. The respective averages for these two months are 88 hours 49 minutes, and 243 hours 34 minutes, showing that the extreme range of the year 1904 was practically equal to the average. It may be interesting to compare these values with those of exceptional years. Thus the total duration of bright sunshine for June was only 36 hours 57 minutes in the year 1891, and 122 hours 32 minutes in 1882; for the month of December, 188 hours 28 minutes in 1902, and 308 hours 22 minutes in 1897; showing a possible variation of nearly 100 per cent. of the average in winter, and 50 per cent. in summer. In the year 1904 the sun remained above the horizon of Melbourne 4,420 hours, but was covered by clouds during 2,420 of these hours, the remaining 2,000 hours being the total duration of bright sunshine of the year, which is only 9½ hours less than the average, and represents a mean daily duration of 5 hours 28 minutes, or only 5 minutes below the mean daily duration of a normal year. The highest and lowest number of hours of sunshine recorded in any year since 1881 are as follow:—2,335 hours in 1898, and 1,737 hours in 1901.

Solar radiation.

The maximum temperature of direct solar radiation ranges, in normal years, from 116 degrees F. to 159 degrees F. the lowest value taking place in June and the highest in January; but there are records of very exceptional years in which the maximum thermometer reading in the sun has barely reached 109 degrees in June, and exceeded 178 degrees in December, the extreme values on record being 108·6 degrees for the lower limit and 178·5 degrees for the upper. The range in 1904 was from 117·8 in June to 160·2 degrees in December. The solar heat was less intense in January, February, March, and November, and more intense in May, June, October, and December than that of the corresponding months in average years, and was approximately normal in the remaining three months.

Terrestrial radiation.

The lowest temperature to which the layer of air near the ground falls at night is a very important climatic factor, as showing the extent to which the ground cools by throwing off into space the heat which it may have accumulated during the day.

In clear wintry nights the ground thermometer has been known to fall as low as 20·4 degrees, which is the lowest record for Melbourne, and nearly 2 degrees below freezing-point, even in the hottest period of summer.

In average years the minimum temperature near the ground, at night, ranges from 35 degrees to 40 degrees in the first four months, and in the last two months of the year, and from 26 degrees to 31½ degrees in the intermediate months. In 1904 it remained within 1 degree (one degree) of the average during the months of April, June, July, August, October, and November; from 1½ degrees to 2½ degrees above average in the months of January and February, and about 2 degrees below average in March, May, and September. The only exceptional condition of the year in respect to terrestrial radiation was the minimum ground temperature for December, which was 5 degrees below average, and the lowest ever recorded in this month at Melbourne.

Humidity.

The figures given in Tables I. and II., to indicate the varying degree of humidity of the atmosphere, are based on a scale in which saturation is represented by 100, and are the monthly means derived from the daily values, which latter depend on three daily observations of the dry and wet bulb thermometers. The relative humidity during the first quarter of the year 1904 was greater than that recorded for the same period in any previous year of observation. It was also above average, but to a much less extent, in October; below average in December, and approximately normal in the remaining months.

Evaporation.

Under ordinary conditions the amount of water lost through evaporation at a free water surface is greatest in January. It decreases gradually to its minimum value in June, then rises steadily to the end of the year, thus following the seasonal variations of temperature. But it depends also on the behaviour of other climatic elements, such as the frequency and strength of the winds, the relative humidity, the duration of sunshine, and other conditions.

Thus in the year 1904 we find the evaporation below average in the dull and relatively cool summer, above average in the fine, mild, sunny months of April and May, and in the extremely dry month of December, while in the other months, in which the general character of the average Melbourne climate prevailed, evaporation was approximately normal. The total amount of water which passed into the atmosphere in the state of vapour during the year 1904 was 36.16 inches, which amount is about one inch less than the average, also 9 inches less than the highest value, and 5 inches more than the lowest value on record.

Explanation of Table I., *infra*.

(1) Pressure of Air.—Under this heading are given, for each month, the mean, the highest, and the lowest readings of a standard barometer, placed at an elevation of 93 feet above mean sea level,

the readings being reduced to the temperature of freezing point. The daily means from which the monthly mean is computed are based on three observations made each day, at 9 a.m., 3 p.m., and 9 p.m., Melbourne Mean Time.

(2) Temperature of Air in Shade. —The eight columns under this heading give respectively:—

(*a*) The mean for each month, as computed from the daily means, which are based on three observations made each day, at 9 a.m., 3 p.m., and 9 p.m.

(*b*) The monthly average of the highest temperature recorded every day, technically called "Mean of Daily Maxima," or more briefly, Mean Max.

(*c*) The monthly average of the lowest temperature recorded each night, technically called "Mean of Daily Minima," or, more briefly, Mean Min.

(*d*) The daily average range, viz., the monthly mean of the daily differences between the highest and the lowest temperature of air in shade observed each day.

(*e*) The highest and the lowest readings of the thermometer observed in each month, with the dates on which these extremes concerned.

(3). Solar Radiation.—The three columns under this heading give respectively:—

(*a*) The monthly mean of the highest readings, shown by a black bulk thermometer in vacuo, on each day in the corresponding month, popularly known as "the heat in the sun."

(*b*) The highest reading registered by the black bulb thermometer in each month, with date on which it occurred.

These values represent the varying heating powers of the solar rays after passing through the atmosphere.

(4). Terrestrial Radiation.—Under this heading are given:—

(*a*) The monthly mean of the lowest readings shown each night in the corresponding month, by a self-registering thermometer placed horizontally near the surface of the ground on top of short grass.

(*b*) The lowest reading registered in each month, with date on which it occurred.

(5). Mean Humidity.—The values in this column show the average monthly amount of invisible water vapour which the atmosphere actually contained, expressed as a percentage of the maximum amount which it could have held, or would have required to become saturated, under the same conditions of temperature.

(6). Spontaneous Evaporation.—In this column are given the values representing the height in inches of a layer of water which was lost in each month of the year, through evaporation, at the free surface of water contained in a cistern fully exposed in the open, slightly below the surface of the ground. These values serve to give an approximate idea of the amount of water which passes from the free surface of rivers, lakes, ponds, &c., into the atmosphere, in the state of water vapour, under the conditions of the Melbourne climate.

(7). Cloud.—The amount of cloud at any moment is usually expressed by a number, in the series 0 to 10, which is intended to represent the proportion of the area covered by cloud at the time of observation to the area of the whole visible sky. Thus, 0 indicates total absence of cloud, 10 an entirely overcast sky, and intermediate numbers partial cloudiness. Several observations are made daily, from which the average cloudiness of each day is computed. The monthly values given in this column are the means of the daily values in the corresponding months.

(8). The Rainfall.—Number of wet days and of foggy days are given in the next three columns, which do not require explanation.

(9). Number of hours of sunshine.

(10). The number of hours during which the wind blew from each of the principal 8 points of the compass, and the duration of calms.

(11). The mean velocity of winds, in miles per hour.—The quantities given in this, the last column of the Table I., represent the velocity of a steady flow, which, if continued uniformly throughout a month, would be equivalent to the total motion of air actually registered in that month.

In this table, which is based on all available records of past years, it is only necessary to explain the process by which the three different sets of values, namely, "Average," "Highest," and "Lowest," as set down for each month and for each element, have been arrived at. Explanation of Table II *infra.*

We may take as an example the element, "Absolute Maximum Temperature of Air in Shade" for January. We have on the Observatory register 48 values of the highest temperature recorded in the month of January during the past 48 years; the mean of all these values is 102·6 deg., which is the average absolute maximum temperature for January. But amongst the same 48 values we find one of 111·2 deg., which is the greatest, and another 94·7 deg., which is the smallest of all. Thus, we say in regard to this particular element, that the highest temperature of air in shade at Melbourne in the month of January is on an average 102·6 deg., but there have been other years in which it has been as high as 111·2 deg., or as low as 94·7 deg. in January. These are the three values given in the table as the Average, Highest, and Lowest for the Absolute Maximum for January. The same reasoning applies to all the elements throughout the table.

TABLE I.—MELBOURNE CLIMATE. METEOROLOGICAL MEANS AND EXTREMES FOR EACH MONTH OF THE YEAR 1904.

Month.	Pressure of Air.			Temperature of Air in Shade.								Solar Radiation.			Terrestrial Radiation.		
	Mean.	Highest.	Lowest.	Mean.	Mean Max.	Mean Min.	Mean Daily Range.	Absolute Extremes.				Mean.	Highest.	Date.	Mean.	Lowest.	Date.
								Highest.	Date.	Lowest.	Date.						
	in.	in.	in.	°	°	°	°	°		°		°	°		°	°	
January ..	29.819	30.148	29.292	64.1	74.9	57.0	17.9	94.2	9	48.1	27	137.3	151.2	9	50.6	41.0	22
February ..	29.764	30.191	29.361	63.2	73.7	56.8	16.9	96.7	18	49.0	29	134.9	153.2	18	51.5	41.8	29
March ..	29.995	30.209	29.597	59.2	68.3	52.7	15.6	79.2	31	41.7	24	127.9	141.9	1	47.0	33.4	24
April ..	30.116	30.409	29.347	60.4	71.3	50.9	20.4	86.9	7	41.8	1	128.8	140.1	1	42.7	34.2	24
May ..	30.052	30.423	29.587	55.3	64.3	48.2	16.1	77.8	13	35.9	25	115.3	132.9	9	40.4	28.9	24
June ..	29.947	30.277	29.321	49.7	56.9	45.0	11.9	64.9	21	32.9	18	103.1	120.1	21	38.6	26.8	18
July ..	30.087	30.475	29.279	48.2	55.7	42.8	12.9	64.4	23	31.5	23	98.9	117.8	3	35.8	26.6	23
August ..	30.013	30.398	29.489	49.8	57.5	43.9	13.6	62.8	22	34.0	26	107.0	125.3	17	37.0	27.0	26
September	29.941	30.303	29.473	49.8	59.1	43.3	15.8	69.2	24	35.1	12	120.5	133.9	13	36.8	27.6	12
October ..	29.875	30.359	29.281	56.8	68.1	48.9	19.2	88.7	31	38.2	3	128.5	147.9	31	42.9	31.0	3
November ..	29.859	30.252	29.195	59.6	71.0	50.8	20.2	92.2	16	41.6	20	134.6	146.7	16	43.5	33.0	20
December ..	29.841	30.159	29.511	64.3	78.1	53.4	24.7	102.0	24	44.7	22	140.2	160.2	24	45.2	33.2	1

Month.	Mean Humidity per cent. — Satn.=100	Amount of—			No. of Days of		No. of Hours of Sunshine.	Number of Hours during which the Wind blew from—							Calm.	Mean Velocity in Miles. per hour.
		Spontaneous Evaporation.	Cloud. — Scale. 0 to 10.	Rain in inches.	Rain.	Fog.		N.	N.W.	W.	S.W.	S.	S.E.	E.	N.E.	
January ..	0.73	4.95	5.6	5.68	14	0	221	79.0	54.5	66.5	107.5	172.5	107.5	35.0	86.5	35.0	8.9
February ..	0.74	3.91	6.3	6.24	10	1	176	67.5	21.5	72.5	147.0	150.5	109.0	32.5	34.0	61.5	8.8
March ..	0.78	2.97	6.6	0.95	8	2	156	19.0	12.0	99.0	135.5	180.0	165.5	29.0	21.5	82.5	6.5
April ..	0.74	2.39	4.2	0.77	3	3	192	62.5	57.5	42.5	66.0	105.0	103.5	79.0	125.0	79.0	5.4
May ..	0.75	1.57	5.7	2.56	16	2	119	204.0	110.5	74.0	35.0	45.0	50.0	29.0	140.0	56.5	6.9
June ..	0.80	1.35	7.7	3.29	18	3	80	171.5	62.5	189.0	109.0	14.0	10.0	26.0	79.5	58.5	8.0
July ..	0.81	0.89	6.4	1.57	12	5	103	175.5	105.5	101.5	89.5	27.0	92.5	12.0	103.0	37.5	7.8
August ..	0.75	1.42	7.1	3.28	13	1	101	195.0	90.0	146.5	92.5	41.5	9.5	21.5	102.0	45.5	8.4
September	0.70	2.16	6.0	1.26	12	1	151	159.0	62.5	158.0	102.0	78.5	30.5	18.5	69.0	42.0	8.9
October ..	0.74	2.85	5.0	2.72	11	0	203	120.0	61.5	114.0	109.0	115.5	46.5	32.0	92.5	53.0	7.5
November ..	0.67	4.93	5.4	1.29	8	0	232	73.0	71.0	177.0	112.5	121.5	77.0	17.5	32.5	38.0	9.5
December	0.58	6.79	4.7	0.11	3	0	265	42.0	20.0	108.0	125.0	193.5	110.0	53.5	50.5	39.5	8.6

TABLE IA.—The table below contains the values of the principal meteorological elements for the whole year 1904, with the corresponding averages and extremes based on the Climatic elements.

OBSERVATORY RECORDS OF 48 YEARS.

Meteorological Elements.	Year 1904.	Average for 48 years.	Extreme between which the Average Values have oscillated in 48 years.	
			Highest.	Lowest.
Mean atmospheric pressure (inches)	29.942	29.936	..	..
Highest " " "	30.475	30.678	..	..
Lowest " " "	29.195	28.868	..	..
Range "	1.280	1.364	1.719	1.169
Mean temperature of air in shade, Fahrt. ..	56.7	57.4	58.7	56.3
Mean daily maximum	66.6	67.3	69.0	65.8
Mean daily minimum	49.5	49.3	51.2	47.2
Absolute maximum	102.0	102.6	111.2	96.6
Absolute minimum	31.5	31.6	33.9	27.0
Mean daily range	17.1	18.0	20.3	14.6
Absolute annual range	70.5	74.3	82.6	66.0
Solar radiation (maximum)	160.2	139.3	178.5	108.6
Terrestrial radiation (minimum)	26.6	33.0	46.2	20.4
Rainfall (in inches)	29.72	25.55	44.25	15.61
Number of wet days	128	132	165	102
Year's amount of free evaporation (in inches) ..	36.165	37.5	45.65	31.59
Percentage of humidity (saturation = 100) ..	73	72	..	..
Cloudiness (scale 10 = overcast, 0 = clear) ..	5.9	5.9	..	..
Duration of sunshine (number of hours) ..	1,999	1,997	..	..
Number of days of fog	18	17	..	..

TABLE II.—CLIMATE OF MELBOURNE. CLIMATOLOGICAL TABLE, BASED ON THE RECORDS OF THE MELBOURNE OBSERVATORY FOR THE PERIOD 1858–1903.

Meteorological Elements.		Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Year.
Pressure of Air—		in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Mean for each Month.. ..		29.883	29.885	29.964	30.024	30.025	29.995	30.023	29.983	29.920	29.884	29.875	29.820	29.936
Highest recorded in each month		30.265	30.413	30.456	30.502	30.678	30.664	30.640	30.582	30.610	30.489	30.385	30.281	30.678
Lowest recorded in each month		29.135	29.199	29.342	29.233	29.051	29.119	29.165	29.033	29.030	29.002	29.123	28.868	28.868
Range ..	Average	0.767	0.744	0.707	0.804	0.903	0.969	0.974	0.992	0.965	0.916	0.795	0.849	1.361
	Highest	1.071	0.998	1.039	1.143	1.399	1.298	1.399	1.503	1.337	1.346	1.081	1.309	1.709
	Lowest	0.564	0.511	0.489	0.542	0.551	0.667	0.677	0.667	0.665	0.695	0.554	0.645	1.169
Temperature of Air in Shade—		°	°	°	°	°	°	°	°	°	°	°	°	°
Mean for each month	Average	66.2	66.3	63.8	58.6	53.2	49.7	47.6	50.3	53.1	56.7	60.5	63.6	57.4
	Highest	71.5	73.8	67.8	60.8	56.4	53.4	50.8	53.0	55.5	59.5	64.1	68.5	58.7
	Lowest	60.6	62.7	59.8	54.6	50.9	46.4	45.3	47.1	50.3	53.5	56.8	57.9	56.3
Absolute Maximum for each month	Average	102.6	100.1	95.5	84.7	71.7	64.0	63.1	69.2	74.6	84.5	93.4	99.1	102.6
	Highest	111.2	109.5	105.5	94.0	82.1	68.1	68.4	77.0	81.8	96.1	105.7	110.7	111.2
	Lowest	94.7	89.6	86.7	74.0	66.0	57.5	58.7	61.9	71.0	73.8	83.5	86.6	96.6
Absolute Minimum for each month	Average	47.2	46.9	44.3	41.3	36.8	33.6	31.5	33.4	35.6	38.3	41.9	45.3	31.5
	Highest	52.0	53.5	51.4	45.5	42.0	38.0	39.0	39.6	41.5	42.8	45.5	48.8	33.9
	Lowest	42.0	40.3	37.1	34.8	31.3	28.0	27.0	28.3	32.1	32.1	36.5	40.0	27.0
Mean of daily Maximum	Average	78.1	77.8	74.8	68.6	61.4	56.8	55.5	58.8	62.7	67.1	71.3	75.3	67.3
	Highest	85.2	86.4	79.2	73.3	67.4	61.8	58.2	61.6	65.4	71.1	78.1	81.2	69.0
	Lowest	73.0	72.4	69.2	62.5	58.3	52.9	52.2	56.0	59.3	63.5	66.9	70.1	65.8
Mean of daily Minimum	Average	56.4	56.6	54.6	50.6	46.5	43.8	41.4	43.1	45.4	48.1	51.0	53.7	49.3
	Highest	60.4	62.2	61.7	54.7	49.4	49.2	45.6	45.8	48.5	50.8	53.8	57.6	51.2
	Lowest	53.2	52.5	50.3	47.4	43.4	40.7	38.8	39.7	43.1	45.4	46.6	50.4	47.2
Mean daily range in each month	Average	21.7	21.2	20.2	18.0	14.9	13.0	14.1	15.7	17.3	19.0	20.4	21.5	18.0
	Highest	26.2	26.7	24.1	24.2	20.2	17.5	17.6	19.5	20.5	23.2	27.2	27.8	20.3
	Lowest	16.8	16.4	15.9	12.4	11.1	7.7	10.3	12.7	13.7	15.6	15.1	16.2	14.6
Monthly range	Average	55.4	53.2	51.2	43.6	34.9	30.3	31.6	35.8	40.5	46.2	51.5	53.7	..
	Highest	63.6	68.6	62.2	58.9	47.0	37.0	39.8	45.3	47.9	59.6	64.2	69.1	..
	Lowest	45.2	38.4	39.6	23.8	24.8	25.9	23.4	26.0	34.6	33.4	40.9	41.9	..

TABLE II.—CLIMATE OF MELBOURNE. CLIMATOLOGICAL TABLE—*continued.*

Meteorological Elements.		Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Year.
Temperature of Air—		°	°	°	°	°	°	°	°	°	°	°	°	°
Terrestrial Radiation	Average	39.6	39.3	36.6	34.7	30.6	27.7	25.5	27.4	29.5	31.4	34.9	38.1	24.7
	Highest	45.6	46.2	44.2	41.0	36.0	32.7	29.8	34.2	34.4	39.2	40.6	45.0	28.4
	Lowest	30.2	30.9	28.9	25.0	23.2	20.4	20.5	21.3	25.3	25.9	24.6	34.0	20.4
Solar Radiation	Average	158.7	155.8	150.9	140.5	127.4	118.3	117.7	125.9	124.1	142.8	149.9	153.3	161.2
	Highest	178.5	167.5	164.5	152.0	140.6	128.5	125.3	137.4	141.7	154.3	159.6	170.3	178.5
	Lowest	144.6	143.0	139.9	129.7	117.5	108.6	109.0	115.5	121.1	136.8	139.7	142.3	108.6
		in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Monthly Amount of Registered Rainfall	Average	1.88	1.70	2.15	2.46	2.13	2.08	1.83	1.79	2.34	2.71	2.30	2.25	25.61
	Highest	6.83	6.78	6.36	6.71	6.94	5.22	7.02	7.62	5.87	7.61	12.13	7.18	44.25
	Lowest	0.04	0.03	0.16	0.57	0.45	0.60	0.49	0.48	0.61	0.28	0.25	0.17	15.61
Number of Days of Rain Recorded in each month	Average	7	7	8	11	13	13	15	13	14	13	11	9	132
	Highest	14	15	19	19	20	21	20	18	22	21	16	20	165
	Lowest	1	1	3	5	6	7	7	7	8	7	3	4	102
		in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Amount of Evaporation at a Free Water Surface for each month	Average	6.37	5.00	3.86	2.26	1.49	1.11	1.07	1.47	2.29	3.29	4.49	5.71	38.24
	Highest	8.33	6.38	5.15	2.99	2.69	2.31	1.66	2.11	3.23	5.80	5.79	7.50	45.65
	Lowest	4.84	3.84	2.79	1.57	0.97	0.61	0.66	1.03	1.64	2.56	3.19	3.70	31.59
Percentage of Humidity. Saturation=100	Average	0.64	0.65	0.68	0.73	0.79	0.80	0.80	0.75	0.72	0.70	0.67	0.65	0.72
	Highest	0.72	0.75	0.75	0.84	0.86	0.88	0.88	0.81	0.81	0.79	0.75	0.72	0.76
	Lowest	0.57	0.54	0.61	0.63	0.70	0.75	0.74	0.65	0.63	0.64	0.59	0.55	0.67
Mean Daily Amount of Cloudiness	Average	5.1	5.2	5.5	5.8	6.5	6.6	6.3	6.3	6.1	6.0	5.9	5.6	5.9
	Highest	6.7	6.8	7.4	7.7	8.0	7.7	7.5	8.0	7.4	7.1	7.2	6.9	6.4
	Lowest	3.9	3.2	3.7	3.1	4.7	3.2	5.1	4.7	5.0	4.8	4.7	3.8	5.4
		h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.	h.m.
Mean Daily Duration of Sunshine in Hours	Average	8.16	7.36	5.40	4.37	3.38	2.57	3.19	4.11	4.55	5.43	7.16	7.51	5.33
	Highest	9.57	9.12	8.19	5.56	4.59	4.50	5.16	5.32	6.21	7.18	9.10	9.57	9.57
	Lowest	6.33	5.32	4.18	2.13	2.18	1.14	2.30	2.34	3.35	4.13	6.60	6.50	1.14
Total Number of Hours of Sunshine in each Month	Average	256.25	214.60	175.16	138.0	112.52	89.12	103.48	130.15	147.40	181.37	218.14	242.36	2010.2
	Highest	309	258	241	178	154	123	164	172	191	274	266	308	2335
	Lowest	203	155	133	66	71	37	64	80	107	131	180	188	1738
Number of Days of Fog	Average	0.1	0.4	0.6	1.6	2.8	4.0	4.0	2.0	0.7	0.4	0.2	0.2	16.9
	Highest	2	3	2	7	10	14	11	8	6	2	2	4	39
	Lowest	0	0	0	0	0	0	1	0	0	0	0	0	5

THE BUTTER INDUSTRY.

The growing importance and value of the butter industry is such as to warrant special notice of anything which may possibly affect it. During the course of the past year a very important Commission was appointed by the Government to inquire into and report upon the industry generally. The Commission was the outcome of the intense dissatisfaction of the butter producers throughout the State as to the manner in which the trade was conducted and the consequent losses which they themselves suffered. The labours of the Commission have now been completed and its report, containing many valuable suggestions for the improvement and better development of the industry, has been promulgated for general information. In view of the enormous importance of this industry, a short history of its progress, compiled by the Commission and published as part of its report, is inserted:—

History of the Butter Industry.

An Extract from the Report of the Royal Commission on the Butter Industry.

The butter industry in Victoria prior to the year 1888 had received little or no assistance from the Government towards developing the trade. The supplies during the spring and summer seasons were more than equal to the local demand, but most unsatisfactory during the winter months. The value of the industry to the people of Victoria was recognised by the Government in 1888, and practical attention given to the development of the trade. It was important that the quality of the butter should be improved, and more economical methods of production adopted, before the product could be profitably sold in London and foreign markets. Many obstacles presented themselves to this development. That modern methods and appliances should be introduced was absolutely necessary, and, with the object of educating the farmers and dairymen in scientific manufacture, a travelling dairy and experts were employed to give practical demonstrations, and lectures were delivered on the working of a modern dairy. A model dairy and school of instruction, conducted by Government experts at the Centennial Exhibition 1888-9, received much attention from country visitors and students. The simplicity and economical working of these dairies awakened the producers to the wealth in the industry when developed under the favorable conditions existing in Victoria.

That a profitable export trade to London should be immediately established was of vital importance to Victorian producers. The State was losing the intercolonial trade, which had been the outlet for surplus cask butter. In addition to the butter made on farms, a number of factories had been established, so that in 1889 the question of finding a market for the surplus supply was very pressing.

A system of inspection and stamping butter for export had been organized, and, subject to this inspection and approval, the Government of the day, out of the grant of £233,000 made in 1889-90 to promote the agricultural, dairy, fruit, and wine industries, set aside a sum of £30,000 "for the giving of bonuses for dairy produce and fruit of best quality and in best order exported to foreign markets." This bonus was payable on produce exported after the 21st October, 1889, subject to regulations gazetted 2nd May, 1890. The £30,000 provided proved inadequate, and an additional sum of £23,000 was, on the 23rd December, 1891, diverted from the purposes set out in the original grant 1889-90, and made available for a bonus on butter and fruit exported. Another amount of £26,000 was similarly diverted on the 24th October, 1892, and an additional sum of £40,000 was appropriated by Parliament in 1892-3 as a bonus on dairy produce and fruit exported for the year ending 30th June, 1893, subject to regulations gazetted 24th March, 1893. Butter factories and creameries were also entitled to and received bonuses on buildings, subject to the regulations for the distribution of £37,000 granted by Parliament in respect to factories in the original *Special Appropriation Act* 1889-90.

The bonuses paid on butter exported amounted to £103,599 13s. 1d.; on cheese exported, £1,500 19s. 10d.; on buildings, £30,387 16s. 2d.; making the total £135,488 9s. 1d. In addition to this amount the expenses of handling and freezing the butter prior to export and attending to the marketing of the early shipments were paid by the Government out of the sums granted for bonuses. With the object of assisting the producers in preserving surplus butter during the summer season refrigerating works had been established at Newport, where owners could store their butter in the chambers free of charge for three months. This business was afterwards removed to Melbourne. Refrigerating cars had been provided by the Railway Department, and cool storage erected at the stations.

The facilities afforded by the Government supervision and handling, together with the large sums paid in bounties, were attended with immediate improvement in quality, and a rapid development of the export trade. In 1895, 174 factories were manufacturing butter of a quality not previously attainable, and by means of the modern scientific methods first grade butter was produced in the driest and hottest districts, and the surplus was sold at good prices on the London market.

The factories were, to an extent, established on a co-operative principle, assisted by the Government bonus, but in many instances the butter agents and company promoters more readily realized the profitable nature of the investment, and taking advantage of the bonus, induced the farmers to join with them for the purposes of obtaining control and marketing of the producers' supplies. It is to be regretted that a number of the companies and factories gradually

reverted to the original promoters, or became the sole property of interested agents, the country shareholders consequently losing their subscribed capital.

At the inception of the export trade in 1889 the Government arranged the ocean freights with the mail companies at 1⅛d. per lb., and Government officers attended to the bills of lading. During the following four years, 1890-3, the rate of freight was 1d. per lb., with the exception of 1891-2, when a supposed Sydney firm had secured the whole of the refrigerated space in the steamers, and the Government was compelled to pay an extra ¼d. per lb. to this firm during that season. In 1894 the rate of freight was ⅞d. per lb. An alteration in the shape of the butter boxes had the advantage of increasing the quantity of butter in a ton (shipping measurement) from 1,400 lbs. to 1,764 lbs., but the P. and O. and Orient lines refused to accept lower freights. A contract entered into by the Minister of Agriculture with another line of steamers on the 1st May, 1896, at ¾d. per lb., forced the mail companies to reduce the rate of freight to that figure, and as a number of shippers decided to support the P. and O. and Orient lines, the Department had to compromise with these companies and the outside line that had effected a reduction of ⅛d. per lb. The mail steamers have retained the advantage gained in 1896 until the present year, 1905, when the contracts expire, and the freight on butter to London remained under contract with these companies and the factories at ¾d. per lb., whilst shippers outside the contract have been shipping their butter by other lines at ¼d. per lb. New contracts are now being entered into with other lines at ⅜d. per lb., and advantages are offered to shippers which the mail companies refused to grant.

After the Government withdrew the assistance rendered to the factories by attending to all the bills of lading and arranging for the sale of a number of the early shipments to London, the factories continued to send their butter direct to the Government Cool Stores, and employed agents to arrange for insurance, and negotiate with the banks for advances on bills of lading. The actual commission charged by these agents in the early history of the trade cannot be definitely stated, but it was gradually reduced to 6, 5, and 4 per cent. This charge covered Melbourne and London commissions. When a number of factories co-operated in 1901 to do their own agency business in Melbourne, it was considered that 3½ per cent. was sufficient to allow for the export, and 4 per cent. for the local business. This allowance was practically reduced by a ½ per cent. after deducting the bonuses returnable to the factories. Since the appointment of this Royal Commission, English firms have agents in Victoria who have secured a good proportion of the trade, and are doing the business at 2½ per cent. Some local agents are now prepared to accept 3 per cent.

In 1893 the Government occupied fifteen chambers of the Melbourne City Council's building in Flinders-street for the purpose of freezing and chilling perishable produce for export prior to shipment. The chambers included a space of 3,491 square feet, and the Department of Agriculture paid the Council 6s. a ton for chilling and 10s.

a ton for freezing the produce. In 1894 the Government leased the chambers at a rental of £2,750 per annum, the space being extended to 5,327 square feet. The space and the rental were gradually increased till 1900, and the cool storage space occupied by the Government since that year has been 36,681 square feet. For the chambers and the refrigerating plant, supplies, engineers, and assistants provided by the City Council, the Department of Agriculture pays £15,000 per annum. Butter usually occupies one-third of the space, but in the height of the export season one-half is utilized. The stores are under the immediate control and supervision of the Dairy Expert, Mr. Robert Crowe, who is assisted by five butter experts in the inspection and grading of butter for export, and in the duties of educating the farmers and the inspection of dairies. A large number of the factories are now realizing the benefits to be obtained from grading by Government officers, and 66 factories are having their butter graded at these stores. Prior to the issue of the First Report by this Royal Commission only 22 factories had voluntarily taken advantage of Government grading and certificate. The charge made by the Government for freezing, inspection, issue of bills of lading, and supervision of shipments to steamers is 8s. 4d. per ton, or 2½d. a box (56 lbs.). With the object of encouraging uniform grading, no extra charge is made for this or the issue of certificate which accompanies each consignment graded by the Government experts.

The primary object of grading and use of certificate are to educate the factory managers and dairymen to improve the quality of the butter, and consequently obtain higher value for the product.

The business of attending to the freight on the butter and tallying the quantities in and out of the cool stores, including such clerical work ni connexion with the bills of lading, &c., has been in the hands of Messrs. Mullaly and Byrne since the inception of the export trade. This firm receives 1s. 3d. per ton on all the butter shipped, which is paid by the Agricultural Department. The Railway Department charge an additional 5s. per ton freight for conveying the butter from the Stores to Port Melbourne.

In the years 1889 to 1893, butter for export was packed in casks and "ponds" boxes. The casks held from 50 to 120 lbs., and were sold to the factories and shippers at the rate of 5s. for 112 lbs., equal to a cost of slightly more than ½d. per lb. on the butter packed. The "ponds" enamelled boxes were imported from New Zealand in parts and had to be screwed together by the Victorian shippers and factories. These boxes held 56 lbs. and cost 6s. 4d. each, over 1¼d. per lb. on the butter packed. The casks were not suitable for stowing in the ships' chambers, nor were the "ponds" boxes economical in this respect, as the sides, tops, and bottoms projected, the ends being let into grooves. The cube form of box at present in use was introduced in 1893-4, and the prices for these cases have varied from as high as 1s. 6d. down to 10d. each. The price fixed by the "butter-box combine" for the past two years has been 1s. 4d. per box, equal

to 2-7d. per lb. on the butter packed; since the sittings of the Commission closed the price for these boxes has been reduced by 3d. per box—this will effect a saving to the industry of nearly £10,000 per annum. Experiments are being made with composition boxes that promise well to meet the requirements of the trade. The boxes used in Canada and United States of America are made of American spruce wood, and it is to be expected that the competition arising out of the introduction of this wood, and the composition cases, will have the effect of insuring the producers against higher charges for the New Zealand pine boxes at present used, the prices for which have been controlled by a Melbourne combine.

The drought which for a period during the last ten years so seriously affected the production of grain and wool did not, in comparison, so severely influence the Victorian dairy industry. The exports of butter to London and foreign markets, which, at the inception of the trade in 1889-90, were 400 tons, valued at £50,300, rose rapidly till the season 1894-5, during which 11,600 tons, valued at £1,081,243, were exported. The decline in the quantity exported during the seasons 1895-6 to 1898-9 was, in a measure, due to the Australian demand for Victorian butter increasing. The production in the other States had been reduced in consequence of the drought. The recuperative powers of Victoria are emphasized in a marked degree in the seasons 1899-1900 and 1900-1901, which followed immediately on the break-up of the very dry period; 17,107 tons of butter, valued at £1,604,600, were exported in 1899-1900, and 16,163 tons, valued at £1,664,790, in 1900-1901. No such records have since been established, but it is estimated that the season 1904-5 will equal, if not surpass, them.

The prices obtained for Victorian butter in London has averaged, so far as it is possible to ascertain, 10½d. per lb., or 98s. per cwt. Satisfactory as this average is when compared with that for other Colonial butters, it is much below the average for Danish, which, during the season when Victorian butter is on the London market, has averaged 11⅔d. per lb., or £5 8s. 10d. a cwt. Independent experts have expressed the opinion that choice Victorian is equal to choice Danish, and others have gone further and stated that the Victorian is a better keeping butter than Danish. The difference in the value, after allowing ½d. per lb., or 4s. 8d. a cwt., in favour of the freshness and the regularity in the supply of Danish butter, would be 6s. 2d. a cwt. This anomaly in the values would appear to be due to causes other than the difference in quality. Danish butter has the advantage of Victorian, inasmuch as the marketing of the produce is not controlled or influenced by speculators, nor liable to suffer from deterioration, due to too high a temperature in transit.

A measure of success that has attended Victorian butter in the London and foreign markets is due to the fact that the product is made from the milk of cows fed upon natural pastures. The attractive flavour of the butter is due to the natural pasturage, which also adds to its keeping qualities. These favourable qualities and the

supervision of Government experts have been specially noted by buyers, and have been the means of obtaining a high price as compared with some other Colonial and foreign butters.

It is to an extent due to the advantageous geographical position of Victoria, where the spring and summer seasons fit in with the European winter months, and the supervision organized by the Government that have, in a degree, protected the producers against the practices adopted to secure for the middlemen the bulk of the profits from this important national industry.

This outline of the butter industry of Victoria would show that the Government has recognised the right and duty of the State to educate and assist the producers. While realizing the stimulus given to the butter trade by the bonuses and other material assistance, we are of opinion that a more perfect system of education and more complete supervision are essential for the advancement of the trade, as well as for the protection of the scientific as against the ignorant or careless producer.

Legislation for the betterment of the trade should be in the direction of prohibition of abuses rather than the extension of bounties or concessions. The export trade for Victorian butter is now established and to advance and guard its reputation on London and foreign markets require such restrictive legislation, and as a means of suppressing certain trade practices to which the industry has been subjected this legislation is as urgent as it is necessary.

In the matter of education and legislation it has been almost unanimously acknowledged that the benefits to be obtained from scientific education for the encouragement of the industry and legislation for the purpose of protecting the trade will only prove partially successful unless universally followed and adopted throughout the Commonwealth.

Agricultural, Dairying, and Pastoral Industries.

Expenditure on agricultural bonuses.

The Constitution Act provides that, after the inauguration of Federation, the control of the payment of bounties shall pass to the Executive Government of the Commonwealth. A State is therefore precluded from offering bounties on the production or export of its products, and the Department of Agriculture is now only dealing with applications for the bonuses to the extent for which provision had been made at the time of the establishment of the Commonwealth. Out of the provision that had been made prior to that time, the State Government, up to the end of June, 1904, had paid out of the general revenue the sum of £373,673.

A sum of £35,000 was authorized under the *Treasury Bonds Act* 1896, £100,000 under Act 62 Vict. No. 1566, and £100,000 under Act 59 Vict. No. 1440. Of the £35,000, the sum of £31,239 had been spent up to the 30th June, 1904, leaving a balance available on that date of £3,761. The amounts authorized out of that

sum (£35,000) for green fruits exported; honey exported; raisins, currants, and figs made; assistance to wineries, for viticultural education, and for other purposes, have been practically exhausted. Of the £100,000 authorized under Act No. 1566, the expenditure up to the 30th June, 1904, amounted to £57,260, and of that under Act No. 1440 to £62,000. Particulars appear in the following table in respect to all bonuses granted under various Loan Acts:—

BONUSES GRANTED UNDER LOAN ACTS.

Subject of Bonus.	Period during which Bonus operated.	Rate of Bonus.	Amount Authorized.	Expenditure to 30.6.1904.
Under Treasury Bonds Act 1896.			£	£
Green Fruit exported	prior to 24.7.96	2s. per case	5,500	5,404
	after 6.11.96	1s. "		
Honey exported	prior to 9.11.95	1d. per lb.	61	61
Raisins, Currants, and Figs made	1895	£5 per ton	2,134	2,134
Vegetable Oil manufactured ...	...	1s. per gall.	1,500	197
Flax and Hemp Fibre produced	...	£5 per ton	1,000	557
General Vegetable Products grown	1895	£2 per acre	5,000	3,624
Wineries (assistance in building machinery and appliance producing 60,000 gallons of wine in three years)	...	£2,000 each	8,000	8,000
Viticultural Education ...	...	...	8,000	7,999
Fruit Pulp exported	...	½d. per lb.	3,805	3,263
Total	...	...	35,000	31,239
Under Act 62 *Vict. No* 1566.				
District Co-operative Wineries and Viticulture Industry ...			20,000	15,085
Dairy Schools, Experimental Stations, purchase of Live Stock, Machinery, Implements and other Appliances, and Technical Agricultural Education			30,000	29,988
Development of the Export trade			32,500	7,565
Bonuses for the encouragement of the Cultivation, Manufacture, and Export of Fruit, Tobacco, Flax, Hemp, Silk, and of other Rural Industries			17,500	4,622
Total			100,000	57,260
To Beet Sugar Factory under Act No. 1440			100,000	62,000
Grand Total			235,000	15,0499

In addition, various sums have been advanced from loans and votes for the purpose of aiding closer settlement, for the resumption of mallee lands, and for relief to farmers on account of bush fires, flood losses, and purchase of seed wheat and fodder. A portion of these advances has been repaid, and interest as it becomes due is duly collected.

Particulars of subsidies paid in aid of agricultural industries during each of the five financial years ended with 1903-4, are as follow:— Subsidies to agriculture.

SUBSIDIES IN AID OF AGRICULTURE, &c.: RETURN FOR FIVE YEARS.

——	1899-1900.	1900-1.	1901-2.	1902-3.	1903-4.
	£	£	£	£	£
Agricultural and Horticultural Societies, &c.	3,948	6,529	6,484	2,392	2,392
Carriage of Grain at reduced Rates—Allowance to Railway Department	45,000	62,000	75,000	6,521	48,000
To promote the Agricultural, Dairying, Fruit, and Wine Industries	1,047	1,607	1,146	370	153
Expenses in connexion with export of Dairy Produce, Fruits, Meat, Rabbits, and other produce	28,303	28,602	33,503	33,672	27,500
Development of Export Trade	...	...	...	...	1,679
Viticultural Education and inspection of Vineyards	...	...	...	...	1,871
Eradication of Vine Diseases	2,954	426	50	...	...
,, Noxious Weeds and Insects	2,258	2,335	2,983	3,804	4,147
Scab Prevention and Stock Diseases	5,772	5,180	4,970	5,358	7,417
Rabbit and Vermin Extermination	14,801	15,817	17,250	16,489	15,759
Maffra Beet Sugar Company—Expenses in connexion with	2,358	839	1,015	486	454
Seed Advances	37	23	17	110	67
Technical Agricultural Education	...	...	...	9,786	12,077
Publishing Agricultural Reports	...	...	...	3,990	2,739
Total	106,478	123,358	142,418	82,978	124,255

The net increase in expenditure on subsidies in aid of agriculture has been £41,277. The details of increases are:—Allowances to Railway Department for carriage of grain at reduced rates, £41,479; eradication of noxious weeds and insects, £343; scab prevention and stock diseases, £2,059; technical agricultural education, £2,291. The added items are:—Development of export trade, £1,679; and viticultural education and inspection of vineyards, £1,871. The reductions are:—Promotion of agricultural, &c., industries, £217; expenses in connexion with export of dairy produce, &c., £6,172; rabbit and vermin extermination, £730; Maffra beet sugar company, £32; seed advances, £43; and publishing agricultural reports, £1,251.

In addition to the sum given above for 1903-4, there was expended by the State a sum of £7,465 on salaries and contingencies in the Department of Agriculture, and £2,085 in aid of village settlements and labour colonies.

Occupations of persons settled on the land—Agricultural (Census).

The occupations of persons settled on the land are only collected in the census years in full detail. In 1891 the number engaged in agricultural pursuits was 82,482, and in 1901 that number had increased to 95,920. The following return gives particulars of persons mainly engaged in agricultural pursuits when the last census was taken:—

RETURN OF PERSONS ENGAGED IN AGRICULTURAL PURSUITS, 1901.

Persons Following Agricultural Pursuits.	Employers of Labour.		In Business on their own account.		Receiving Salary or Wages.		Relatives Assisting.		Not at work for more than a week prior to Census	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Farmer and Relative Assisting ..	13,267	1,099	15,096	1,693	—	—	16,361	13,238	—	—
Farm Manager, Overseer	—	—	—	—	359	6	—	—	3	—
Farm Servant, Agricultural Labourer	—	—	—	—	20,204	599	—	—	956	5
Market Gardener	859	19	1,647	32	1,518	9	576	132	22	—
Fruit Grower, Orchardist	493	44	868	91	700	43	465	172	14	—
Hop, Cotton, Tea, Coffee Grower	10	2	7	—	48	48	9	2	—	—
Tobacco Grower	10	—	25	—	24	—	1	—	—	—
Vine Grower, Vigneron	174	18	72	8	1,131	6	86	39	6	—
Sugar Planter	1	—	—	—	—	—	—	—	—	—
Horticulturist, Gardener	237	7	571	17	2,132	7	107	39	214	—
Agricultural Department Officer ..	—	—	—	—	41	—	—	—	—	—
Others, Threshing Machine Owners and Workers, &c.	20	1	26	—	72	2	4	3	103	—
Total	15,071	1,190	18,312	1,841	26,229	720	17,609	13,625	1,318	5

Total Males	78,539
Total Females	17,381
Grand Total	95,920

Occupations of persons settled on the land—Pastoral and dairying (Census).

In 1891 the number of persons engaged in pastoral and dairying pursuits was 15,296, and in 1901, 30,920. The full particulars for last census year are as follow:—

RETURN OF PERSONS ENGAGED IN PASTORAL AND DAIRYING PURSUITS, 1901.

Persons Following Pastoral and Dairying Pursuits.	Employers of Labour.		In Business on their own account.		Receiving Salary or Wages.		Relatives Assisting.		Not at work for more than a week prior to Census.	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Grazier, Pastoralist, Stock Breeder and Relative Assisting	2,242	177	2,422	303	—	—	1,159	1,062	—	—
Station Manager, Overseer, Clerk	—	—	—	—	593	4	1	7	39	—
Stock Rider, Drover, Shearer, Shepherd, Pastoral Labourer	47	—	100	—	4,540	7	5	—	248	—
Dairy Farmer, and Relative Assisting	2,205	276	3,007	756	—	—	3,263	4,456	—	—
Dairy Assistant, Milker	—	—	—	—	3,194	386	—	—	32	3
Poultry Farmer	19	8	132	79	17	3	16	41	1	—
Stock and Brands Department Officer	—	—	—	—	18	—	—	—	—	—
Others, including Pig Farmers ..	3	1	10	—	34	—	2	—	2	—
Total	4,516	462	5,671	1,138	8,396	400	4,446	5,566	322	3

Total Males	23,351
Total Females	7,569
Grand Total	30,920

The total occupied lands of the State on 31st December, 1904, consisted of 32,181,048 acres, and are described below, with particulars for the previous year. These lands are used principally for farming, dairying, and pastoral purposes, and for market gardens, orchards, vineyards, &c. :— Land in occupation.

1903.		1904.	
Private Lands—	Acres.	Private lands—	Acres.
Freehold	16,382,752	Freehold ...	16,811,076
Leasehold	7,642,637	In process of purchase from the Crown	2,893,682
Crown Lands (leased) ...	7,051,823	Leasehold ...	4,879,384
		Crown lands (leased)	7,596,906
Total	31,077,212	Total	32,181,048

Of the total occupied, 3,389,069 acres were under crop in 1903, and 3,321,785 acres in 1904.

Of these occupied lands, the number of holdings are described as follow :— Holdings.

Holdings for—	1903.	1904.
	No.	No.
Farming principally	32,477	32,740
Dairying principally	10,384	11,720
Pastoral pursuits principally	6,141	8,138
Total	49,002	52,598

As the collection of pastoral holdings was made for the first time in 1903, it is considered that it was not only incomplete, but that many holdings used for pastoral purposes were returned under the head of dairying. The return of pastoral holdings for 1904 is regarded as accurate. The increase of nearly 2,000 for the year, shown in the table, is therefore almost certainly not a real one. Prior to 1903, cultivated and dairying holdings only were returned.

Persons engaged in rural pursuits.

The number of persons employed on these holdings is shown in the following statement:—

	Number.	
	1903.	1904.
Hands Employed—		
Farming principally ... ... males	55,194	53,933
" " ... ... females	27,202	27,166
Dairying principally ... ... males	19,205	21,509
" " ... ... females	16,409	18,623
Pastoral principally ... ... males	12,923	14,954
" " ... ... females	4,950	6,144
Total ... ... males	87,322	90,396
" ... ... females	48,561	51,933
Total	135,883	142,329

Comparing the two years, it is noticeable that a considerable falling off has taken place in the number of male hands employed in farming, and a slight decrease in the number of females. In dairying, there has been a material increase in the number of both males and females, corresponding to the increase in the number both of holdings and of dairy cattle in the State. The number of hands ordinarily employed on any holding includes the occupier or manager, and those members of his family who actually work on it; but persons absent from their farms for the greater portion of the year following other occupations, as well as temporary hands engaged in harvesting, &c., are not included, neither are domestic servants nor cooks.

Comparing the figures of 1904 with those of the census of 1901, an increase of 15,489 persons is shown as having been engaged in agricultural and pastoral pursuits in 1904. There is, however, a falling off in the number of males of 11,494, and an increase in the number of females employed of 26,983—mostly in dairying and farming work—and this result is probably to be accounted for by the large emigration of men since 1901.

Area under cultivation.

In the following table will be found figures showing the land under cultivation in 1903 and 1904:—

Cultivated for—	1903.	1904.
	acres.	acres.
Wheat	1,968,599	2,277,537
Other Grain Crops	504,189	415,292
Root Crops	55,684	52,038
Hay	733,353	452,459
Green Forage	33,165	29,902
Vines	28,513	28,016
Orchards	51,357	52,751
Market Gardens	8,455	7,904
All other Crops	5,754	5,886
Land in Fallow	632,521	853,829
Total Cultivation	4,021,590	4,175,614

The area under cultivation, exclusive of permanent and artificial grasses, increased from 50 acres sown down with wheat in 1836 to 4,175,614 acres, which were under crops of various kinds, in 1904-5. The first returns of oats, maize, potato, and tobacco crops were obtained in 1838, barley and rye in 1839, hay in 1841, green forage and vines in 1842, peas and beans in 1849, mangel wurzel, carrots, parsnips, turnips, and onions in 1855-6, garden and orchard produce in 1856-7, and chicory, grass and clover seeds, and hops in 1867-8. Returns of land sown with artificial grass were first procured in 1855-6, and since that year steady and uninterrupted progress has been made in this direction. The quantity of land in fallow has also been increasing since 1858-9.

For the ten years—1894-5—1903-4—the total area under cultivation, its proportion to the area of the State—56,245,760 acres—and the yearly increase or decrease, actual and centesimal, were :—

AREA UNDER CULTIVATION: RETURN FOR TEN YEARS.

Year.	Area under Tillage (exclusive of area under artificial Grass).	Proportion to Area of Victoria.	Yearly Increase (+) or Decrease (−) in Area.	Percentage Increase (+) or Decrease (−) Yearly.
	Acres.	Per cent.	Acres.	Per cent.
1895-6 ...	2,704,263	4·80	...	...
1896-7 ...	2,925,416	5·20	+221,153	+8
1897-8 ...	3,144,574	5·59	+219,158	+7
1898-9 ...	3,727,765	6·63	+583,191	+19
1899-0 ...	3,668,556	6·52	−59,209	−2
1900-1 ...	3,717,002	6·61	+48,446	+1
1901-2 ...	3,647,459	6·48	−69,543	−2
1902-3 ...	3,738,873	6·65	+91,414	+3
1903-4 ...	4,021,590	7·15	+282,717	+8
1904-5 ...	4,175,614	7·42	+154,024	+4

The land under cultivation, including land in fallow, but excluding land under artificial grasses, in 1895-6, was 2,704,263 acres, and in 1904-5, 4,175,614—an increase of 1,471,351 acres in the ten years, or over 54 per cent. The increase has been fairly and almost constantly maintained. There are, however, three years in which a slight reduction appears—due probably to accidental causes, or to the influence of bad seasons and adverse climatic conditions. The quantity of land actually under crops of various kinds in 1904-5 was 3,321,785 acres.

Cultivation per head in Australasia.

The average area in cultivation (exclusive of artificial grasses) to each person, in each of the Australian States and New Zealand, on 31st December, 1903, was as follows (the figures for 1904 for some of the States are not yet available) :—

Victoria ...	3·33 acres	Western Australia ...	1·61 acres
New South Wales ...	2·14 ,,	Tasmania ...	1·66 ,,
Queensland ...	1·21 ,,	New Zealand ...	2·14 ,,
South Australia ...	8·83 ,,		

In the following return will be found a statement of the production from cultivated lands for the past two years:—

Crop.	1903.	1904.
Wheat ... ... bushels	28,525,579	21,092,139
Other Grain ... ... ,,	15,800,515	7,932,987
Root Crops ... ... tons	224,138	125,884
Hay ... ... ,,	1,233,063	514,316
Vines ... ... cwt. of grapes	654,965	452,433
Green Forage ... ... £	74,621	74,755
Orchards ... ... £	370,802*	375,685
Market Gardens ... ... £	211,375	197,600
All other Crops ... ... £	42,864	51,879

* Amended since last publication.

Regarding the production of the State in 1904-5 as a whole, the returns are very much below those of the preceding year, notably in wheat, other grain crops, root crops, and hay.

At the end of the years 1903 and 1904 a collection was made for the stock in the State. The results are in the following statement, together with the results of the Census of 1901:—

Stock.	Census, 1901.	1903.	1904.
Horses	392,237	330,763	372,397
Cattle—			
Dairy Cows, milking ...	521,612	520,433	478,918
,, Dry ...			53,568
,, Heifers ...			100,007
Other (including Calves)... ...	1,080,772	903,327	1,062,483
Sheep	10,841,790	9,047,655	10,167,691
Pigs	350,370	180,587	286,070

Detailed information regarding all the summarized particulars of land, cultivation, and production, contained in the foregoing statements, will be found for the years 1903 and 1904, tabulated under the heading of Counties in part "Production" of the Statistical Register of 1904.

The principal crops grown in the State are wheat, oats, barley, potatoes, and hay.

Wheat.

Wheat was first grown in Victoria in 1836, and there was a general increase in the area under cultivation up to 1899-1900, when 2,165,693 acres were sown. In the following seasons there was a decline in the area, until in 1904-5, the quantity of land sown was 2,277,537 acres, the largest recorded, the yield from which is returned at 21,092,139 bushels, which is equal to an average of 9·26 bushels per acre.

Estimated wheat yield, 1904-5.

An estimate of the area under, and the probable yield of wheat for the season 1904-5, was made in November, 1904. The following are the results:—

Estimated area under wheat for grain	2,240,400 acres
,, ,, hay	150,000 ,,
Total	2,390,400 acres
Estimated produce	21,299,850 bushels
Average per acre	9·51 ,,

The results of the wheat harvest, as ascertained by the collectors of statistics, are shown in the accompanying table:—

RETURN SHOWING THE WHEAT YIELDS FOR THE SEASONS 1904-5 AND 1903-4 IN COUNTIES.

Districts and Counties.	Area.		Produce.		Average per Acre.	
	1904–5.	1903–4.	1904–5.	1903–4.	1904–5.	1903–4.
	Acres.	Acres.	Bushels.	Bushels.	Bushels.	Bushels.
Central District—						
Bourke ..	3,184	2,953	48,972	49,482	15·38	16·76
Grant ..	7,190	2,757	111,766	46,975	15·54	17·04
Mornington ..	129	219	1,205	1,933	9·34	8·83
Evelyn ..	33	266	710	5,724	21·52	21·52
North Central Dist.—						
Anglesey ..	1,383	1,523	20,143	26,168	14·56	17·18
Dalhousie ..	6,720	6,305	81,694	86,201	12·16	13·67
Talbot ..	24,082	15,231	384,531	287,898	15·97	18·90
Western District—						
Grenville ..	2,420	809	39,018	14,405	16·12	17·81
Polwarth ..	254	41	2,936	1,123	11·56	27·39
Heytesbury ..	8	20	189	256	23·63	12·80
Hampden ..	483	377	7,795	5,960	16·14	15·81
Ripon ..	58,272	38,562	965,719	590,937	16·57	15·32
Villiers ..	414	732	7,816	10,176	18·88	13·90
Normanby ..	719	1,482	11,466	14,500	15·95	9·78
Dundas ..	3,399	2,501	61,963	34,903	18·23	13·96
Follett ..	974	1,162	16,157	12,621	16·59	10·86
Wimmera District—						
Lowan ..	165,977	147,188	1,878,996	1,982,825	11·32	13·47
Borung ..	380,492	424,224	4,198,169	5,800,568	11·03	13·67
Kara Kara ..	122,512	109,413	1,531,858	1,747,420	12·50	15·97
Mallee District—						
Millewa ..	..	..	..	..	..	..
Weeah ..	20,756	19,788	150,234	245,206	7·24	12·39
Karkarooc ..	360,881	262,963	1,345,789	2,830,194	3·30	10·76
Tatchera ...	342,022	245,723	1,146,768	2,945,289	3·35	11·99
Northern District—						
Gunbower ..	43,555	36,687	381,872	533,406	8·77	14·54
Gladstone ..	107,534	93,021	1,328,792	1,551,823	12·36	16·68
Bendigo ..	110,926	93,575	1,490,773	1,735,104	13·44	18·54
Rodney ..	131,822	122,471	1,634,132	2,130,836	12·40	17·40
Moira ..	328,811	292,888	3,572,725	5,031,670	10·87	17·18
Nth-Eastern Dist.—						
Delatite ..	11,520	9,070	153,758	160,335	13·35	17·68
Bogong ..	36,972	33,243	451,349	577,618	12·21	17·38
Benambra ..	1,013	1,023	15,750	24,441	15·55	23·89
Wonnangatta	24	17	424	363	17·67	21·35
Gippsland District—						
Croajingolong..	88	70	1,092	1,202	12·41	17·17
Tambo ..	16	8	147	132	9·19	16·50
Dargo ..	17	40	189	653	11·12	16·33
Tanjil ..	2,743	2,174	44,340	35,931	16·16	16·53
Buln Buln ..	192	73	2,902	1,301	15·11	17·82
Total ..	2,277,537	1,968,599	21,092,139	28,525,579	9·26	14·49

After the sowing had been completed in 1904, and in view of the extra amount of land laid down under wheat, a favorable season would undoubtedly have produced a crop equal to that of the previous year. The scarcity of rain during the month of September, however, caused grave apprehension as to the harvest prospects, but with the copious rains of October, the outlook was considerably brighter, and the estimate made (21¼ million bushels) has closely approximated to the yield, which, although much less than was anticipated after the sowing, is still second only to that of the previous year, when it was 28,525,579 bushels.

Wheat districts.

The principal wheat-growing districts in the State are the Wimmera, comprising the counties of Lowan, Borung, and Kara Kara; the Mallee, comprising those of Weeah, Karkarooc, and Tatchera; and the northern, comprising Gunbower, Gladstone, Bendigo, Rodney, and Moira. The total area under wheat in the State in 1904-5 was 2,277,537 acres; that in the counties enumerated, 2,115,288 acres, or 93 per cent.

The following table shows the area of each of the principal wheat-growing counties, the cultivation for the years of first and largest record, and for the year 1904:—

WHEAT-GROWING COUNTIES: AREA AND PRODUCTION.

District and County.	Area of County.	First Cultivation Recorded.			Largest Cultivation Recorded.			Cultivation for 1904-5.	
		Year.	Area.	Average Yield Per Acre.	Year.	Area.	Average Yield Per Acre.	Area.	Average Yield Per Acre.
			Acres.	Bushels.		Acres.	Bushels	Acres.	Bushels.
Wimmera Dist.—									
Lowan ..	3,181,440	1871–2	232	16·69	1892–3	257,685	8·58	165,977	11·32
Borung ..	2,740,480	1871–2	4,590	15·59	1903–4	424,224	13·67	380,492	11·03
Kara Kara ..	1,472,640	1871–2	7,987	14·34	1899–00	125,345	9·68	122,512	12·50
Mallee District—									
Weeah ..	2,562,560	1891–2	40	21·00	1902–3	22,592	·46	20,756	7·24
Karkarooc ..	3,797,120	1879–80	233	10·87	1902–3	371,069	·22	360,881	3·30
Tatchera ..	2,138,240	1871–2	2	12·00	1904–5	342,022	3·35	342,022	3·35
Northern Dist.—									
Gunbower ..	862,720	1871–2	181	13·36	1880–1	75,114	9·29	43,555	8·77
Gladstone ..	1,153,280	1869–70	7,988	17·46	1904–5	107,534	12·36	107,534	12·36
Bendigo ..	1,247,360	1869–70	21,03[illegible]	16·26	1904–5	110,926	13·44	110,926	13·44
Rodney ..	1,087,360	1855–6	6[illegible]	26·66	1898–9	132,273	13·92	131,822	12·40
Moira ..	1,986,560	1871–2	14,93[illegible]	15·93	1904–5	328,811	10·87	328,811	10·87

The following table shows the area of each county, and the rise and fall in the cultivation of wheat in the central and north central districts:—

TABLE SHOWING DECLINE OF WHEAT CULTIVATION IN CERTAIN COUNTIES.

District and Area.	Area of County.	First Cultivation Recorded.			Largest Cultivation Recorded.			Cultivation in 1904–5.	
		Year.	Area.	Average Yield Per Acre.	Year.	Area.	Average Yield Per Acre.	Area.	Average Yield Per Acre.
	Acres.		Acres.	Bushels.		Acres.	Bushels.	Acres.	Bushels.
Central District—									
Bourke ..	1,101,440	1855–6	13,606	25·03	1861–2	30,268	17·12	3,184	15·38
Grant ..	1,173,760	1855–6	12,072	25·65	1861–2	35,349	15·86	7,190	15·54
Mornington ..	1,040,000	1855–6	943	29·57	1860–1	3,153	14·03	129	9·34
Evelyn ..	750,080	1855–6	1,124	31·43	1859–60	1,789	15·43	33	21·52
N. Central Dis.—									
Anglesey ..	1,034,080	1855–6	129	28·77	1874–5	4,146	12·96	1,383	14·56
Dalhousie ..	838,400	1855–6	3,113	26·67	1869–70	25,124	21·47	6,720	12·16
Talbot ..	1,037,440	1855–6	445	33·68	1871–2	76,555	13·81	24,082	15·97

The following is a table showing the area under wheat during the last ten years, the gross produce, and the average yield per acre:—

WHEAT: RETURN FOR TEN YEARS.

Year.	Area under Crop.	Gross Produce.	Average per Acre.
	Acres.	Bushels.	Bushels.
1895–6	1,412,736	5,669,174	4·01
1896–7	1,580,613	7,091,029	4·49
1897–8	1,657,450	10,580,217	6·38
1898–9	2,154,163	19,581,304	9·09
1899–00	2,165,693	15,237,948	7·04
1900–1	2,017,321	17,847,321	8·85
1901–2	1,754,417	12,127,382	6 91
1902–3	1,994,271	2,569,364	1·29
1903–4	1,968,599	28,525,579	14 49
1904–5	2,277,537	21,092,139	9·26

In 1902-3 wheat was grown on about 17,100 holdings, in 1903-4 on 17,400 holdings, and in 1904-5 on 18,045 holdings. The decline in the yield and the average per acre, which is observed during the few years prior to 1903-4, has been due to the severity of the seasons which has been experienced all over the wheat-growing districts of the State. In 1903-4 the yield was the highest ever recorded, although the area under crop was not so large as in the previous year. The yield in 1904-5, 21,092,139 bushels, comes next to that of 1903-4.

On 31st December, 1904, there were equivalent to 2,052,225 bushels of old wheat on railways and in mills and stores, 428,578 bushels on farms, and 162,815 bushels in vessels (not cleared),

making a total of 2,643,618 bushels; but against this quantity, 33,740 bushels of the new season's wheat had been consumed up to that date, leaving a balance of old stocks on hand, exclusive of the recent harvest of 2,609,878 bushels.

The following table shows, for 1898, and each subsequent year, the mean population of Victoria; the stocks of old wheat and flour on hand at the beginning of each year; the quantity of wheat grown; the quantity (after deducting imports) of wheat, flour, and biscuit exported; and the breadstuffs left over and available for home consumption. In addition to the quantity required for food consumption, a stock is required for seed purposes, equal, on an average, to three-quarters of a bushel per acre:—

POPULATION AND WHEAT RETURNS.

Year.	Mean Population.	Stocks of old wheat and flour on hand (1st January).	Wheat harvested for season ended March in each year.	Wheat, Flour, and Biscuit.	
				Exported after deducting Imports.	Available for Home Consumption.
		Bushels.	Bushels.	Bushels.	Bushels.
1898 ...	1,172,950	330,224	10,580,217	1,855,951	9,054,490
1899 ...	1,186,265	1,282,902	19,581,304	10,662,011	10,202,195
1900 ...	1,193,338	2,121,700	15,237,948	7,011,242	10,348,406
1901 ...	1,202,960	1,872,000	17,847,321	10,248,093	9,471,228
1902 ...	1,207,110	1,525,288	12,127,382	3,899,246	9,753,424
1903 ...	1,208,880	903,616	2,569,364	−4,495,403*	7,968,383
1904 ...	1,207,537	173,708	28,525,579	17,820,889	10,878,398
1905 ...	1,210,530 (31st March)	2,609,878	21,692,139	Not	available.

* Net import.

Disposal of breadstuffs.

The manner in which the breadstuffs available for home consumption have been disposed of in each of the years under review is as follows:—

DISPOSAL OF BREADSTUFFS.

Year.	Wheat and Flour.				
	Quantity available for Home Consumption.	How disposed of—			
		Stocks on hand on 31st December.	Required for Seed.	Used for Food, &c.	
				Total.	Per Head.
	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1898 ...	9,054,490	1,282,902	1,770,941	6,000,647	5·12
1899 ...	10,202,195	2,121,700	1,772,602	6,307,893	5·32
1900 ...	10,348,406	1,872,000	1,696,000	6,780,406	5·68
1901 ...	9,471,228	1,525,288	1,529,249	6,416,691	5·33
1902 ...	9,753,424	903,616	1,616,946	7,232,862	5·99
1903 ...	7,968,383	173,708	1,626,954	6,167,721	5·10
1904 ...	10,878,398	2,609,878	1,807,351	6,461,169	5·35.

Population and breadstuffs.

With the exception of 1896 and 1903, the breadstuffs produced in the twenty-eight years ended 1904 have been more than enough to supply home consumption. Wheat has, therefore, been exported each year, with these two exceptions. The maximum export was 17 4-5 million bushels in 1904.

In the following table will be found a return showing the estimated wheat produce of the world for 1903. The information has been extracted partly from the report of the Board of Agriculture and Fisheries for Great Britain for 1903, and partly from the Statistical Year Book of Canada for the same year. The average yield per acre sown in all the countries named (except Australia) varies from 11 to as high as 38 bushels. In Australia, the yield per acre for the five years, 1897-1901, averaged about 7½ bushels; in 1902, it was only about 2½; in 1903, it was about 13⅓; and in 1904, it was 8⅔. The average for the last three years, taken together, was slightly more than 8¼ bushels per acre—about equal to the average of the preceding five years. It must be remembered, however, that much of our wheat, especially in Victoria and South Australia, is grown on land such as the Mallee, where, according to the experience of many years, there is but a light rainfall, and only light crops can be expected. Further, the practice of manuring these lands has only been adopted by the farmers to any extent during recent years, their attention having been strongly drawn, through the Department of Agriculture, to the important fact that manuring invariably increases the yield. In many cases, in Victoria, through the zeal and energy of the officers of the Department, and the good will of farmers in furnishing land for the purpose, experiments have been carried on, and as great an advantage as 3 bushels to the acre has resulted in favour of manured, as compared with adjoining unmanured lands. With the more extensive use of manures, there can be very little doubt that the Australian yield of wheat can be very largely increased.

WORLD'S ESTIMATED WHEAT CROP, 1903.

Country.	Produce.	Country.	Produce.
	Bushels.		Bushels
Europe—		Asia—	
Austria	44,158,000	Asia Minor ..	34,000,000
Hungary ..	165,134,000	India	294,726,000
Belgium ..	12,000,000	Japan	20,000,000
Bulgaria ..	36,000,000	Persia	24,000,000
Denmark ..	4,000,000	Russia—Siberia and	
France	351,990,000	the Steppes ..	69,646,000
Germany ..	130,590,000	Syria	24,000,000
Great Britain ..	48,818,000	Africa—	
Greece ..	6,000,000	Algeria	24,000,000
Holland ..	6,000,000	Cape Colony ..	4,000,000
Italy	178,750,000	Egypt	12,000,000
Portugal ..	6,000,000	Tunis	8,000,000
Carried forward..	989,440,000	Carried forward ..	514,372,000

WORLD'S ESTIMATED WHEAT CROP, 1903—*continued.*

Country.	Produce.	Country.	Produce.
	Bushels.		Bushels.
Brought forward..	989,440,000	Brought forward ..	514,372,000
Europe—*continued.*			
Roumania ..	71,500,000	America—	
Russia—In Europe	453,178,000	Argentine Republic ..	100,587,000
,, Poland	19,196,000	Canada—Manitoba ..	40,112,000
,, Northern Caucasia	77,698,000	,, North-West Territories	16,112,000
Servia	36,000,000	,, Ontario ..	21,893,000
Spain	100,000,000	Chili	12,000,000
Sweden ..	5,374,000	Mexico	14,000,000
Switzerland ..	4,000,000	United States ..	617,890,000
Turkey in Europe	40,000,000	Uruguay	8,000,000
		Australasia—	
		Australia	74,128,000
		New Zealand ..	7,892,000
Total—Europe..	1,796,386,000	Total—Outside Europe	1,426,986,000

GRAND TOTAL .. .. 3,223,372,000 bushels.

Oats. In 1903-4, the land under this crop was 344,019 acres, from which a yield of 6,203,429 bushels was obtained, giving an average of 18·03 bushels to the acre. The following return shows the harvest results for this crop since 1894-5:—

OATS: RETURN FOR TEN YEARS.

Year.	Area under Crop.	Gross Produce.	Average per Acre.
	Acres.	Bushels.	Bushels.
1895-6	255,503	2,880,045	11·28
1896-7	419,460	6,816,951	16·25
1897-8	294,183	4,809,479	16·35
1898-9	266,159	5,523,419	20·75
1899-00	271,280	6,116,046	22·55
1900-1	362,689	9,582,332	26·42
1901-2	329,150	6,724,900	20·43
1902-3	433,489	4,402,982	10·16
1903-4	433,638	13,434,952	30·98
1904-5	344,019	6,203,429	18·03

Barley. The area under barley was 46,089 acres in 1904-5, 30,799 acres being under malting barley, and 15,290 acres under other barley. There is a remarkable divergence in the quantity of land sown under barley, owing doubtless to the uncertainty of the seasons, the market

for this product being uniformly good. The following shows the return for ten years:—

BARLEY: RETURN FOR TEN YEARS.

Year.	Area under Crop		Gross Produce.		Average per Acre.		
	Malting.	Other.	Malting.	Other.	Malting.	Other.	Total.
	Acres.	Acres.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1895–6	71,789	6,649	624,388	91,204	8·70	13·70	9·12
1896–7	53,421	8,952	641,406	174,199	12·01	19·45	13·08
1897–8	26,118	11,087	592,411	256,043	19·24	23·09	20·39
1898–9	33,584	14,275	776,785	335,782	23·13	23·52	23·25
1899–00	65,970	13,603	1,197,948	268,140	18·16	19·71	18·42
1900–1	49,723	9,130	1,003,477	212,001	20·18	23·22	20·65
1901–2	25,480	6,943	527,564	166,287	20·71	23·95	21·40
1902–3	26,436	11,280	394,877	166,267	14·94	14·74	14·88
1903–4	33,586	14,174	878,721	339,282	26·17	23·80	25·50
1904–5	30,799	15,290	575,505	298,594	18·69	19·53	18·97

Potatoes.

The greatest quantity of land planted with potatoes was 57,334 acres in 1891-2; the next being 56,383 acres in 1894-5; and 55,469 acres in 1899-1900. The highest yield was 204,155 tons in 1890-1, the next 200,523 tons in 1891-2. The area planted in 1904-5 was 46,912 acres, and the produce 92,872 tons, or 1.98 tons per acre. The following table shows the potato return for ten years:—

POTATOES: RETURN FOR TEN YEARS.

Year.	Area under Crop.	Gross Produce.	Average per Acre.
	Acres.	Tons.	Tons.
1895–6	43,895	117,238	2·67
1896–7	43,532	146,555	3·37
1897–8	44,197	67,296	1·52
1898–9	41,252	161,142	3·91
1899–00	55,469	173,381	3·13
1900–1	38,477	123,126	3·20
1901–2	40,058	125,474	3·13
1902–3	49,706	168,759	3·40
1903–4	48,930	167,736	3·43
1904–5	46,912	92,872	1·98

Hay.

Statistics of the hay crop were collected as far back as 1841, when 450 acres returned 900 tons. From that date onward there has been a steady increase in the quantity of land cut for hay. The greatest area under hay was in 1903-4, when 733,353 acres were cut; in 1901-2, 659,239 acres; in 1902-3, 580,884 acres; and in 1904-5, 452,372 acres were harvested. The highest yield attained was 1,233,063 tons in 1903-4, the next being 884,369 in 1901-2, 740,049 in 1892-3, and 723,299 in 1898-9. In 1904-5, the quantity

of straw returned was 385,108 tons, a portion of which was stock held over from previous years. The following is a table of the hay crop for the last ten years:—

HAY: RETURN FOR TEN YEARS.

Year.	Area under Crop.	Gross Produce.	Average per Acre.
	Acres.	Tons.	Tons.
1895–6	464,482	390,861	·84
1896–7	416,667	449,056	1·08
1897–8	580,000	659,635	1·14
1898–9	565,345	723,299	1·28
1899–00	450,189	596,193	1·32
1900–1	502,105	677,757	1·35
1901–2	659,239	884,369	1·34
1902–3	580,884	601,272	1·04
1903–4	733,353	1,233,063	1·68
1904–5	452,372	514,316	1·14

The five principal crops.

The area under the five principal crops during the last five years, its proportion to the population, the production of these crops, and its proportion to the population, are exhibited in the following table. The proportion of land under wheat ranges from about 1½ to nearly 2 acres per head; that under oats is very little more than a quarter of an acre; that under barley and potatoes is, for each crop, about 4 acres to 100 people; and hay from a half to nearly three-quarters of an acre per head. The produce in the same period shows great variation; the wheat ranges from 2·12 bushels per head in 1902-3 to 23·60 in 1903-4; oats from 3·63 to 11·11 in the same years; barley from about half a bushel in 1902-3 to 1¼ bushels in 1899-1900, falling back to ¾ of a bushel in 1904-5; potatoes yielded 2 cwt. per head in 1900-1 and 1901-2, and about 3 cwt. per head in 1899-1900, 1902-3, and 1903-4, and again fell away to under 2 cwt. last year. The hay yield was equal to 1 ton per head in 1903-4, the nearest average to this being three-quarters of a ton in 1901-2. The smallest yield during the past six seasons was obtained last year.

TABLE SHOWING, FOR FIVE PRINCIPAL CROPS, THE AREA AND PRODUCTION PER HEAD OF POPULATION: RETURN FOR SIX YEARS.

Year.	AREA UNDER—				
	Wheat.	Oats.	Barley.	Potatoes.	Hay.
	Acres.	Acres.	Acres	Acres.	Acres.
1899–00 ..	2,165,693	271,280	79,573	55,469	450,189
1900–1 ..	2,017,321	362,689	58,853	38,477	502,105
1901–2 ..	1,754,417	329,150	32,423	40,058	659,239
1902–3 ..	1,994,271	433,489	37,716	49,706	580,884
1903–4 ..	1,968,599	433,638	47,760	48,930	733,353
1904–5 ..	2,277,537	344,019	46,089	46,912	452,372

TABLE SHOWING, FOR FIVE PRINCIPAL CROPS, THE AREA AND PRODUCTION, &c.—*continued.*

Year.	Wheat.	Oats.	Barley.	Potatoes.	Hay.
	PRODUCTION.				
	Bushels.	Bushels.	Bushels.	Tons.	Tons.
1899–00 ..	15,237,948	6,116,046	1,466,088	173,381	596,193
1900–1 ..	17,847,321	9,582,332	1,215,478	123,126	677,757
1901–2 ..	12,127,382	6,724,900	693,851	125,474	884,369
1902–3 ..	2,569,364	4,402,982	561,144	168,759	601,272
1903–4 ..	28,525,579	13,434,952	1,218,003	167,736	1,233,063
1904–5 ..	21,092,139	6,203,429	874,099	92,872	514,316
	AREA PER HEAD OF POPULATION.				
	Acres.	Acres.	Acres.	Acres.	Acres.
1899–00 ..	1·82	·23	·07	·05	·38
1900–1 ..	1·69	·30	·05	·03	·42
1901–2 ..	1·45	·27	·03	·03	·54
1902–3 ..	1·65	·36	·03	·04	·48
1903–4 ..	1·62	·36	·04	·04	·61
1904–5 ..	1·88	·28	·04	·04	·37
	PRODUCTION PER HEAD OF POPULATION.				
	Bushels.	Bushels.	Bushels.	Tons.	Tons.
1899–00 ..	12·81	5·14	1·23	·15	·50
1900–1 ..	14·91	8·00	1·02	·10	·57
1901–2 ..	10·01	5·56	·57	·10	·73
1902–3 ..	2·12	3·63	·46	·14	·50
1903–4 ..	23·60	11·11	1·01	·14	1·02
1904–5 ..	17·47	5·14	·72	·08	·42

Yield, Australian States and New Zealand.

The following return shows the yield of the principal crops in the various Australian States and New Zealand for each of the seven years ended March, 1905:—

YIELD OF PRINCIPAL CROPS IN AUSTRALASIA: RETURN FOR SEVEN YEARS.

Year ended March.	Victoria.	New South Wales.	Queensland.	South Australia.	Western Australia.	Tasmania.	New Zealand.
WHEAT.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1899 ...	19,581,304	9,276,216	607,012	8,778,900	870,909	2,303,512	13,073,416
1900 ...	15,237,948	13,604,166	614,414	8,453,135	966,601	1,101,303	8,581,898
1901 ...	17,847,321	16,173,771	1,194,088	11,253,148	774,653	1,110,421	6,527,154
1902 ...	12,127,382	14,808,705	1,692,222	8,012,762	956,886	963,662	4,046,589
1903 ...	2,569,364	1,585,097	6,165	6,354,912	970,571	876,971	7,457,915
1904 ...	28,525,579	27,334,141	2,436,799	13,209,465	1,855,460	767,398	7,891,654
1905 ...	21,092,139	16,464,415	2,149,663	12,023,172	2,005,146	792,956	9,123,673

YIELD OF PRINCIPAL CROPS IN AUSTRALASIA: RETURN FOR SEVEN YEARS—*continued.*

Year ended March.	Victoria.	New South Wales.	Queensland.	South Australia.	Western Australia.	Tasmania.	New Zealand.
OATS.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1899 ...	5,523,419	278,007	4,047	304,002	55,854	2,271,070	16,511,388
1900 ...	6,116,046	627,904	10,712	218,331	73,556	1,148,160	16,325,832
1901 ...	9,582,332	593,548	7,855	366,229	86,433	1,406,913	19,085,837
1902 ...	6,724,900	687,179	42,208	469,254	163,653	1,702,659	15,045,233
1903 ...	4,402,982	351,758	520	620,823	161,714	1,752,745	21,766,708
1904 ...	13,434,952	1,252,156	70,713	902,936	255,300	1,621,950	15,107,237
1905 ...	6,203,429	652,646	15,137	555,696	226,556	1,178,819	14,553,611
BARLEY.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1899 ...	1,112,567	64,094	34,865	234,135	29,295	184,225	1,677,908
1900 ...	1,466,088	132,476	118,443	188,917	56,587	142,721	1,585,145
1901 ...	1,215,478	114,228	127,144	211,102	29,188	116,911	1,027,651
1902 ...	693,851	103,361	277,037	243,362	34,723	167,483	855,993
1903 ...	561,144	18,233	3,595	317,155	45,778	201,133	1,136,232
1904 ...	1,218,003	174,147	510,557	487,920	51,487	212,459	1,160,504
1905 ...	874,099	266,781	331,772	346,718	37,801	163,194	1,128,164
POTATOES.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1899 ...	161,142	61,900	16,413	14,445	5,698	88,166	298,561
1900 ...	173,381	81,337	24,675	19,716	8,373	101,670	222,124
1901 ...	123,126	63,253	20,014	14,566	4,835	93,862	169,042
1902 ...	125,474	39,146	22,402	15,059	5,739	114,704	206,815
1903 ...	168,759	30,732	3,257	28,312	6,200	163,518	193,267
1904 ...	167,736	56,743	17,649	31,415	4,315	168,419	208,787
1905 ...	92,872	48,754	33,257	19,521	5,607	110,547	134,608
HAY.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1899 ...	723,299	334,297	70,235	258,518	77,297	82,448	151,240
1900 ...	596,193	546,850	103,409	229,800	70,078	51,123	136,468
1901 ...	677,757	526,260	78,758	353,662	103,813	94,198	136,046*
1902 ...	884,369	472,621	122,039	346,467	89,729	88,125	125,968*
1903 ...	601,272	243,289	23,181	308,825	91,593	89,210	†
1904 ...	1,233,063	816,810	136,117	479,723	119,156	115,513	†
1905 ...	514,316	366,293	80,662	294,252	114,033	73,457	†

* Estimated. † Not available.

Proportion of land under each crop.

The proportion of the land in Victoria under each crop to the total area under tillage during the last seven years, was:—

PROPORTION OF LAND UNDER CROP IN VICTORIA: RETURN FOR SEVEN YEARS.

Year ended March—	Proportionate Area to Total Cultivated Land under— (Exclusive of Area under Artificial Grass.)					
	Wheat.	Oats.	Barley.	Potatoes.	Hay.	Other Tillage.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
1899	57·78	7·13	1·28	1·11	15·17	17·53
1900	59·05	7·39	2·17	1·51	12·27	17·61
1901	54·28	9·75	1·58	1·03	13·51	19·85
1902	48·09	9·02	·89	1·11	18·07	22·82
1903	53·34	11·59	1·01	1·33	15·54	17·19
1904	48·95	10·78	1·19	1·22	18·24	19·62
1905	54·54	8·24	1·10	1·12	10·84	24·16

This information has been procured direct from the growers in February and March. The following is the average price for each of the last seven years:— Prices of agricultural produce.

PRICES OF PRODUCE: RETURN FOR SEVEN YEARS.

Year.	Average Price in February and March.						
	Wheat.	Oats.	Barley.		Hay.	Potatoes.	
			Malting.	Other.		Early Crop.	Main Crop (after March.)
	Per bushel.	Per bushel.	Per bushel.	Per bushel.	Per ton.	Per ton.	Per ton.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1899	2 2	1 $7\frac{3}{4}$	4 $2\frac{1}{2}$	2 $2\frac{1}{4}$	34 5	73 0	36 5
1900	2 5	2 1	3 $2\frac{3}{4}$	2 $3\frac{1}{4}$	40 9	41 11	26 11
1901	2 $5\frac{3}{4}$	1 $6\frac{1}{2}$	2 $10\frac{3}{4}$	1 $11\frac{1}{4}$	39 4	73 11	55 10
1902	2 $10\frac{1}{4}$	2 4	3 $9\frac{1}{4}$	2 $9\frac{1}{4}$	55 5	77 7	84 4
1903	6 0	3 $2\frac{3}{4}$	4 $5\frac{3}{4}$	3 8	100 1	91 3	47 1
1904	2 8	1 $1\frac{1}{2}$	2 $10\frac{1}{2}$	1 $9\frac{1}{2}$	27 2	52 6	26 1
1905	2 $11\frac{1}{2}$	1 6	3 $2\frac{1}{2}$	2 1	33 6	110 0	84 0

Dealing with the prices of wheat ruling during the year, Messrs. Goldsbrough, Mort, & Co., report as follows:—"Local prices, as is always the case where a large surplus is available, were wholly dependent on and determined by values in London, the market quickly responding to any sudden fluctuation reported from that centre. This year's fluctuations were governed by a diversity of causes, the war in the Far East and the diminished supply of the United States being chiefly responsible for the advances in prices, whilst the heavy shipments from Russia, Argentina, and India to European countries contributed largely to the decline."

LOCAL WHEAT PRICES, 1904.

	Lowest Price per Bushel.	Highest Price per Bushel.
	s. d.	s. d.
January	2 9	... 3 0
February	2 9	... 3 $5\frac{1}{4}$
March	3 0	... 3 3
April	2 11	... 3 2
May	3 0	... 3 $1\frac{1}{2}$
June	2 $10\frac{1}{2}$	... 3 $0\frac{1}{2}$
July	2 11	... 3 2
August	3 $1\frac{1}{2}$	... 3 $6\frac{1}{2}$
September	3 $4\frac{1}{2}$	... 3 $8\frac{1}{2}$
October	3 6	... 3 10
November (New Wheat)	3 2	... 3 6
December ,,	3 3	... 3 5

Other crops.

The following table shows the area and production under other crops, 1899-00 to 1904-5:—

OTHER CROPS: RETURN FOR SIX YEARS.

Crop.	1899–00.		1900–1.		1901–2.	
	Area.	Production.	Area.	Production.	Area.	Production.
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
Maize	11,037	624,844	9,389	604,180	10,020	615,472
Rye	1,050	13,896	823	11,989	828	14,418
Peas and Beans ..	12,243	164,414	7,812	146,357	8,297	169,971
		Tons.		Tons.		Tons.
Mangel-wurzel ..	788	9,597	636	7,670	865	9,679
Beet, Carrots, Parsnips, and Turnips	584	4,710	507	4,514	561	4,140
Onions	4,436	19,905	2,815	12,766	4,151	20,859
Green Forage ..	18,574	..	18,975	..	32,795	..
		Bushels.		Bushels.		Bushels.
Grass and Clover Seeds	2,283	28,022	2,235	35,084	1,877	60,144
		Cwt.		Cwt.		Cwt.
Hops	713	2,884	401	2,741	307	2,249
Tobacco ..	155	1,365	109	311	103	345
Vines—Grapes ..	27,550	298,920	30,634	631,912	28,592	497,269
Flax	185	85 fibre 604 seed	259	145 fibre 717 seed	200	268 fibre 842 seed
Gardens and Orchards	54,573	..	57,496	..	58,807	..
Other Crops ..	2,937	..	2,596	..	2,991	..
Land in Fallow ..	509,244	..	602,870	..	681,778	..
Artificial Grasses	151,949	..	207,896	..	162,954	..

Crop.	1902–3.		1903–4.		1904–5.	
	Area.	Production.	Area.	Production.	Area.	Production.
	Acres.	Bushels.	Acres.	Bushels.	Acres.	Bushels.
Maize	10,906	750,524	11,810	904,239	11,394	623,736
Rye	1,487	21,179	2,021	29,586	2,267	30,578
Peas and Beans ..	8,085	141,888	8,960	213,735	11,523	201,145
		Tons.		Tons.		Tons.
Mangel-wurzel ..	1,392	17,174	1,564	21,305	1,441	13,894
Beet, Carrots, Parsnips, and Turnips	747	5,600	1,014	9,879	823	6,149
Onions	5,565	27,467	4,176	25,218	2,862	12,969
Green Forage ..	31,145	..	33,165	..	29,902	..
		Bushels.		Bushels.		Bushels.
Grass and Clover Seeds	1,568	15,836	2,749	35,660	2,249	27,300
		Cwt.		Cwt.		Cwt.
Hops	213	1,572	214	2,447	251	1,449
Tobacco ..	171	781	129	848	106	...
Vines—Grapes ..	28,374	444,966	28,513	654,965	28,016	452,433
Flax	233	320 fibre 990 seed	259	61 fibre 1,226 seed	564	320 fibre 781 seed
Gardens and Orchards	58,415	..	59,812	..	60,655	..
Other Crops ..	2,201	..	2,403	..	2,716	..
Land in Fallow ..	492,305	..	632,521	..	853,829	..
Artificial Grasses	565,635	..	962,665	..	953,543	..

Maize.

In the year 1899-1900 there were 11,037 acres sown with maize, from which a return of 624,844 bushels was obtained. The quantity of land under this crop was fairly constant from that year until 1903-4, when 11,810 acres were sown, and the production was 904,239 bushels. In 1904-5, 11,394 acres were sown, and the produce was 623,736 bushels, Tangil producing 185,160 bushels, Tambo 169,544 bushels, Dargo 102,140 bushels, Croajingalong 98,540 bushels, Buln Buln 18,560 bushels, Bogong 22,516 bushels, Delatite 13,864 bushels. Other countries in the North Eastern and other districts of the State also grow maize, but not to any great extent.

Rye.

The area under rye has increased by 971 acres during the five years ended 1903-4, and a further increase of 246 acres is shown for 1904-5. In 1903-4 the area was 2,021 acres and the production 29,586 bushels; in 1904-5 the area was 2,267 acres, and the production 30,578 bushels. Rye is grown all over the State, except in the Mallee counties of Millewa, Weeah, Karkarooc and Tatchera. In Delatite, the quantity grown was 12,188 bushels, in Bogong 2,523 bushels, in Normanby 2,676 bushels. In Bourke, Anglesey, Talbot and Dundas, the produce was between 1,000 and 2,000 bushels. In the other counties of the State it was under 1,000 bushels.

Peas and beans.

In the area planted with peas and beans there was a falling off from 12,293 acres in 1899-1900 to 8,960 acres in 1903-4. In 1904-5, however, the area was 11,523 acres. On the other hand, the production in the six years has substantially increased, the yields being 164,414 bushels in the former, and 201,145 bushels last year. The falling off from 1903-4, when the produce was 213,735 bushels, is without doubt largely due to the unpropitious season. Peas and beans are grown in all the counties except those in the Mallee, and Gunbower and Bendigo, the principal crops coming from Bourke 37,575 bushels; Grant, 33,640 bushels; Talbot 21,742 bushels; and Buln Buln, 21,607 bushels.

Mangel wurzel.

A very considerable increase was made in the area under mangel wurzel, from 1899-1900 to 1903-4, being in the former year 788 acres, and in the latter, 1,564 acres. During the same period the production has increased from 9,597 tons to 21,305 tons. In 1904-5 both the area and production of this crop were less than in the previous year, the figures being 1,441 acres and 13,894 tons of produce. Mangels are grown principally in the Gippsland counties of Tangil and Buln Buln, and in Bourke, Grant and Villiers. In none of the other counties is the production very large. As the necessity of providing food for the stock during dry seasons becomes more apparent to the farmer, it is hoped that the cultivation of mangel wurzel, as an adjunct to the silo, will be largely extended.

Beet, carrots, parsnips, and turnips.

The cultivation of these crops, exclusive of those grown in market gardens, had nearly doubled in the five years ended 1903-4. In 1904-5, however, there was a reduction in the area under these crops. In 1899-1900 the land sown was 584 acres, in 1903-4, 1,014 acres, and in 1904-5, 823 acres. The produce was 4,710 tons, 9,879 tons, and 6,149 tons in the respective years named.

Onions.

Onions are grown in nearly every county south of the Dividing Range. The counties yielding the largest crops are Mornington, Polwarth, Grant, Bourke, Grenville and Villiers. In Mornington the yield was 2,593 tons from 500 acres; in Polwarth it was 3,204 tons from 657 acres; in Grant, 1,826 tons from 523 acres; in Bourke, 824 tons from 397 acres; in Grenville, 1,173 tons from 314 acres; and in Villiers, 1,154 tons from 155 acres. Buln Buln also added substantially to the total yield. The total area under onions in 1904-5 was 2,862 acres, and the yield was 12,969 tons. The following is a return for the last ten years:—

ONION PRODUCE: RETURN FOR TEN YEARS.

Year.	Area.	Produce.	Year.	Area.	Produce.
	Acres.	Tons.		Acres.	Tons.
1895-6 ..	3,780	10,759	1900-1 ..	2,815	12,766
1896-7 ..	3,735	11,256	1901-2 ..	4,151	20,859
1897-8 ..	3,751	11,217	1902-3 ..	5,565	27,467
1898-9 ..	4,472	17,308	1903-4 ..	4,176	25,218
1899-0 ..	4,436	19,905	1904-5 ..	2,862	12,969

Green forage.

This crop shows an increase during the last five years of 10,927 acres in the area sown. In 1900-1 the quantity was 18,975 acres; in 1901-2, 32,795 acres; in 1902-3, 31,145 acres; in 1903-4, 33,165 acres; and in the year now under review, 29,902 acres.

Grass and clover seeds.

The acreage under grass and clover seeds was 2,235 acres in 1900-1; 1,877 in 1901-2; 1,568 in 1902-3; 2,749 in 1903-4; and 2,249 acres in 1904-5; the production being 35,084, 60,144, 15,836, 35,660 and 27,300 bushels in the respective years.

Hops.

The hop-growing industry attained its maximum development in 1883-4, when 1,758 acres were planted, and yielded 15,714 cwt. Delatite and Dargo were the chief counties in which hops were grown, and in Tangil, Polwarth, Evelyn, and Buln Buln smaller yields were recorded. There has, however, been a heavy falling off in the last twenty years. In 1904-5 there were only 48 growers, whose return from 251 acres was 1,449 cwt.

Flax.

In 1895-6 there were 1,969 acres under crop, but in 1898-9 the area had fallen to 72 acres. Since that year the area sown has gradually increased, the returns for 1903-4 showing 19 growers of flax, who cultivated 259 acres, and produced 1,226 cwt. of seed, 61 cwt. of made fibre, and 4,760 cwt. of straw, awaiting treatment; in 1904-5 there was a considerable increase, the number of growers being 30, the area cultivated, 564 acres, the produce 781 cwt. of seed, 320 cwt. of fibre made, and straw awaiting treatment, 3,060 cwt.

Tobacco.

Besides the experimental plot on the Agricultural College area at Edi, there are many plantations in the counties of Delatite along the banks of the King River and in Bogong. The number of growers in

the State, the area of land cultivated, and the produce for the last ten years, were :—

TOBACCO: RETURN FOR TEN YEARS.

Year.	Number of Growers.	Area.	Produce.
		Acres.	Cwt.
1895–6	303	2,029	15,223 (dry)
1896–7	233	1,264	7,890 ,,
1897–8	77	522	3,419 ,,
1898–9	31	78	190 ,,
1899–0	28	155	1,365 ,,
1900–1	16	109	311 ,,
1901–2	17	103	345 ,,
1902–3	24	171	781 ,,
1903–4	25	129	848 ,,
1904–5	20	106	..

The maximum quantity of tobacco grown was in 1880-1, when 17,333 cwt. of dry leaf was produced. In the years 1895-6, 1896-7, and 1897-8, the produce was respectively 15,223 cwt., 7,890 cwt., and 3,419 cwt., but since the last year quoted the industry has shrunk very considerably.

Vines and wine making.

The area under vines shows a steady increase from 4,284 acres in 1879-80, to 30,307 acres in 1894-5. In 1900-01 the area was 30,634 acres, but in 1904-5 the area was only 28,016 acres. The vineyards are distributed fairly all over the State. There are, however, districts where the principal industries are connected with vine-growing; the Shire of Rutherglen produced 148,209 cwt. of grapes; Yackandandah, 30,454 cwt.; and North Ovens, 11,506 cwt. In the Goulburn Valley wine-making is a flourishing industry. In the Wimmera district, in the County of Borung, there are many vineyards, particularly in the Stawell Shire, where 15,970 cwt. of grapes were produced. At Mildura, 103,426 cwt. of grapes were grown, the crop being dried principally for raisins and currants. The results of ten years' operations are as follow:—

VINE PRODUCE: RETURN FOR TEN YEARS.

Year.	Number of Growers.	Area.	Produce.			
			Grapes Gathered.	Wine made.	Raisins Made.	Currants Made.
		Acres.	Cwt.	Galls.	Cwt.	Cwt.
1895–6	2,975	30,275	479,071	2,226,999	11,183	686
1896–7	2,603	27,934	601,053	2,822,263	11,276	762
1897–8	2,364	27,701	457,437	1,919,389	13,234	462
1898–9	2,453	27,568	468,887	1,882,209	17,979	1,033
1899–0	2,382	27,550	298,920	933,282	17,847	3,315
1900–1	2,486	30,634	631,912	2,578,187	29,370	3,715
1901–2	2,469	28,592	497,269	1,981,475	27,533	2,546
1902–3	2,347	28,374	444,966	1,547,188	35,534	3,722
1903–4	2,260	28,513	654,965	2,551,150	53,447	7,490
1904–5	2,253	28,016	452,433	1,832,386	30,295	5,974

Of the total quantity of grapes gathered—452,433 cwt.—261,770 cwt. were used for making wine, 126,945 cwt. for raisins and currants, and 63,718 cwt. for table consumption and export. That destructive insect affecting the vines, the phylloxera vastatrix, has not during recent years shown itself to any marked extent. Attempts are now being made to effectually combat the pest by the distribution of disease-resistant stocks by the Department of Agriculture.

Orchards growing fruit for sale.

During the year 1903-4 the total number of persons in the State growing fruit for sale was 5,254. In 1904-5 the number was 5,341—an increase of 87. The area under orchards in the former year was 46,624 acres, and in the latter 47,205 acres; an increase of 581 acres. The orchards are fairly spread over the whole State. The largest areas are in the Counties of Evelyn, with 10,658 acres; Bourke, 9,884 acres; Mornington, 6,358 acres; Rodney, 2,717 acres; Talbot, 2,316 acres; Bendigo, 2,108 acres; Karkarooc (including Mildura), 1,687 acres; Grant, 1,573 acres; Borung, 1,566 acres; Buln Buln, 1,131 acres, and Moira, 1,033 acres.

In the following table will be found a statement of the number of fruit trees and plants—showing trees bearing and non-bearing—of the various kinds of fruit grown:—

RETURN SHOWING THE NUMBER OF FRUIT TREES, PLANTS, ETC., IN ORCHARDS AND GARDENS WHERE FRUIT IS GROWN FOR SALE, 1904-5.

Fruit.	Number of Trees, Plants, &c., 1904-5.		
	Not Bearing.	Bearing.	Total.
Apples	831,921	1,026,477	1,858,398
Pears	203,836	188,843	392,679
Quinces	17,900	54,299	72,199
Plums	201,811	237,016	438,827
Cherries	140,657	212,160	352,817
Peaches	115,426	261,295	376,721
Apricots	62,027	226,149	288,176
Nectarines	1,988	5,052	7,040
Oranges	12,773	37,466	50,239
Lemons	22,223	53,870	76,093
Loquats	3,991	3,812	7,803
Medlars	68	191	259
Figs	9,235	35,125	44,360
Passion	4,243	4,525	8,768
Guavas	1,088	397	1,485
Pomegranates	117	144	261
Persimmons	402	771	1,173
Total Large Fruits ..	1,629,706	2,347,592	3,977,298
Raspberries	..	..	4,576,767
Strawberries	..	..	3,896,109
Gooseberries	..	..	455,514
Mulberries	..	..	1,986
Olives	..	..	4,402
Currants (Red, White, and Black) ..	..	..	107,776
Total Small Fruits ..	..	..	..

NUMBER OF FRUIT TREES, PLANTS, &c.—*continued.*

Fruit.	Number of Trees, Plants, &c., 1904-5.		
	Not Bearing.	Bearing.	Total.
Almonds	12,266	21,114	33,380
Walnuts	5,085	3,570	8,655
Filberts	1,078	1,347	2,425
Chestnuts	552	521	1,073
Total Nuts	18,981	26,552	45,533

The area under orchards growing fruit for sale increased steadily from 5,800 acres in 1872-3, 10,048 in 1882-3, 31,370 in 1892-3, 44,502 in 1902-3, to 47,205 acres in 1904-5, which was the largest area returned up to date. Details of the produce from orchards growing fruit for sale are as follow:—

ORCHARD PRODUCE: RETURN FOR FIVE YEARS.

Year.	Number of Fruit-growers.	Area under Gardens and Orchards.	LARGE FRUITS GATHERED.			
			Apples.	Pears.	Quinces.	Plums.
		Acres.	Cases.	Cases.	Cases.	Cases.
1900–1	5,400	44,688	893,418	251,384	71,357	172,467
1901–2	5,693	45,885	652,525	118,742	64,145	201,291
1902–3	5,301	44,502	903,853	248,030	91,665	154,112
1903–4	5,254	46,642	805,034	158,186	81,516	289,972
1904–5	5,341	47,205	1,019,816	188,849	90,735	121,725

Year.	LARGE FRUITS GATHERED—*continued.*						
	Cherries.	Peaches.	Apricots.	Oranges.	Lemons.	Figs.	Others.
	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.	Cases.
1900–1	105,032	160,968	228,686	37,184	57,866	21,846	9,901
1901–2	111,891	284,312	234,101	60,150	64,954	18,135	9,363
1902–3	102,512	173,414	168,348	23,210	48,083	19,214	8,187
1903–4	124,423	260,589	336,899	27,670	61,429	26,405	8,863
1904–5	82,504	230,130	186,360	34,088	81,716	23,500	7,335

Year.	SMALL FRUITS GATHERED.					NUTS GATHERED.			
	Raspberries.	Strawberries.	Gooseberries.	Currants (Red, Black, & White).	Others.	Almonds.	Walnuts.	Filberts.	Chestnuts.
	cwt.	cwt.	cwt.	cwt.	cwt.	lbs.	lbs.	lbs.	lbs.
1900–1	20,396	4,246	12,431	1,794	882	66,837	25,294	6,818	6,469
1901–2	13,610	4,435	10,436	1,383	968	72,528	18,435	3,469	6,990
1902–3	20,185	3,101	11,573	1,456	1,011	41,551	19,378	3,437	8,262
1903–4	22,377	3,122	14,199	2,312	1,327	113,791	13,276	2,223	6,677
1904–5	12,480	5,456	13,558	1,805	1,320	80,758	28,306	1,756	4,396

The following return shows the average produce per tree for all trees for the years 1898-9 and 1901-2, and for all trees, and for bearing trees only, for the year 1904-5:—

PRODUCE OF FRUIT TREES.

Fruit Trees.	AVERAGE PER TREE.			
	1898-9.	1901-2.	1904-5.	
			All Trees.	Bearing Trees.
	Cases.	Cases.	Cases.	Cases.
Apples	·90	·77	·55	·99
Pears	·59	1·00	·48	1·00
Quinces	1·48	1·43	1·26	1·67
Plums	·46	·54	·28	·51
Cherries	·37	·40	·23	·39
Peaches	·56	·52	·61	·88
Apricots	·69	·83	·65	·82
Nectarines	·32	·92	·57	·79
Oranges	·51	·88	·68	·91
Lemons	·65	·87	1·07	1·52
Loquats	·97	·49	·07	·14
Medlars	·40	1·53	·27	·37
Figs	·60	·69	·53	·67
Passion Fruit ..	·20	·43	·20	·39
Guavas	·14	·09	·15	·57
Pomegranates ..	·13	1·13	1·38	2·50
Persimmons ..	2·70	·63	·32	·49
Total Large Fruits only ..	·64	·72	·52	·88
	lbs.	lbs.	lbs.	lbs.
Almonds	2·22	2·78	2·42	3·82
Walnuts	2·99	1·52	3·27	7·93
Filberts	1·34	1·73	·72	1·30
Chestnuts	6·89	6·40	4·16	8·44

This table shows, between 1898-9 and 1901-2, a fair increase in the average production of large fruits, but a serious falling off in 1904-5, *i.e.*, when taking all trees into consideration; and this is probably due to the large planting of young trees during recent years, as well as to a bad season in 1904-5. In this year returns for bearing trees alone have been obtained for the first time.

In addition, large quantities of melons, rhubarb, and tomatoes were produced in these orchards, the following being the quantities returned for 1904-5:—Melons, 15,138 cwt.; rhubarb, 42,813 dozen bundles; and tomatoes, 30,700 cwt. There were also 5,546 acres laid down in private fruit gardens, the value of the produce being estimated at about £10,000.

Heretofore the value of the fruit produce of the State has been estimated at the rate of £25 per acre; but serious doubt has been entertained as to the accuracy of this estimate, and during the year extensive inquiries have been instituted, the most prominent growers, the various fruit associations, and others interested in the trade having been consulted, with the result that it has now been decided to only estimate the value of such fruit as reaches the market. Upon this basis, and according to the prices received by the growers, the estimated value of the fruit sold was £341,585. This, of course, will not represent the actual value of all the fruit grown, large quantities being privately consumed in various ways, but no very reliable estimate of the value of such fruit can be prepared. It may, however, be set down at about £35,000 from orchards growing fruit for sale, and from private gardens.

Market gardens.

The area under market gardens for the year 1904-5 was 7,904 acres. In view of the fact that these gardens are generally situated near large centres of population, and the producers are consequently able to dispose of the bulk of their goods with a minimum of loss from waste, &c., an average return of £25 per acre is regarded as a fair estimate. On this basis, the total value of the produce may be stated as close upon £200,000. This does not include crops of one acre and over of potatoes, onions, mangel wurzel, beet, carrots, parsnips, and turnips, grown in market gardens, such crops being tabulated under their respective heads in the returns relating to agriculture.

Dried fruit.

The quantity of dried (weight after drying) was for the first time collected in 1895-6, when 179,460 lbs. were returned, and it increased to 305,857 lbs. in 1897-8. The details for the last five seasons are:—

DRIED FRUIT: RETURN FOR FIVE YEARS.

Season.	Apples.	Prunes.	Peaches.	Apricots.	Figs.	Total.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
1900–1	28,944	35,931	97,254	411,526	62,639	636,294
1901–2	42,218	33,789	90,328	328,599	66,472	561,406
1902–3	27,113	28,996	70,759	110,666	69,069	306,603
1903–4	25,137	58,293	114,096	184,960	17,599	400,085
1904–5	28,021	33,030	134,019	179,520	41,137	415,777

Of the total quantity dried, 86 per cent. in 1900-1, 77 in 1901-2, 87 in 1902-3, 69 in 1903-4, and 83 per cent. in 1904-5, was dried at Mildura.

Minor crops.

The following is a return of the minor crops harvested during the year ended 31st March, 1905. The items do not in all cases

represent the whole of the respective crops grown, but only such as were taken cognizance of by the collectors:—

MINOR CROPS, 1904-5.

Crop.	Area Sown.	Produce.
	Acres.	
Artichokes	8	910 cwt.
Chicory	287	198 tons (dry)
Flowers	144	..
Millet—Broom	287	599 cwt. fibre 596 cwt. seed
Mustard	1	5 cwt.
Nursery	88	..
Opium poppies	4	60 lbs.
Pumpkins	1,836	16,595 tons
Rape for seed	41	*
Seeds—Agricultural and garden	15	..
Sunflowers	5	50 bushels
Total	2,716	

* Failure.

Land in fallow.

Land commenced to be fallowed in 1858-9, when 6,000 acres were treated in this way. With annual variations in acreage, but a general increase, the area in fallow reached 853,829 acres in 1904-5. The Victorian farmer, therefore, evidently recognises the enormous advantages obtainable from this mode of treating his land; and from the experiments made by the Chemist for Agriculture on manured land, it would appear that, when fallowed in alternate years, there is a gain in grain crops of from 3 to 5 bushels per acre, and on unmanured land the gain is nearly 3 bushels per acre.

Manure.

The quantity of manure used for fertilization has, in the last six years, considerably increased. In 1898, 7,318 farmers used 143,586 tons of natural and 16,052 tons of artificial manure on 225,830 acres of land; in 1901, 11,439 farmers used 153,611 tons of natural and 23,535 tons of artificial manure, on 556,777 acres; whilst in 1902 the increase was still greater, 18,537 farmers using 206,676 tons of natural and 36,630 tons of artificial manure, on 1,099,686 acres. The year 1903 shows a still more extensive use of manure. In this year 19,921 farmers are returned as having used 207,817 tons of natural and 41,639 tons of artificial manure, on 1,205,443 acres of ground. In 1904, 20,167 farmers used 190,903 tons of natural and 45,940 tons of artificial manure on 1,521,946 acres of ground.

In order to ascertain the enormous value of judicious manuring, extensive information has been collected with respect to the results during the past year. For the purposes of the comparison, cases of areas manured and areas not manured in the same localities have been taken, so that the comparison would be made between areas of the same class of land. The results were spread over portions of eleven of the principal wheat-growing counties of the State, and

show that on 214,798 acres manured, the produce was 3,021,553 bushels, or an average of 14·07 bushels per acre; whilst of the unmanured portions the area sown was 165,939 acres, and the produce 1,856,332 bushels, or an average of 11·19 bushels per acre. Full particulars are given in the following table:—

RESULTS OF WHEAT MANURING, 1904-5.

Counties in Wheat Growing Districts.	Manured.			Not Manured.		
	Area.	Produce.	Average per Acre.	Area.	Produce.	Average per Acre.
	acres.	bushels.	bushels.	acres.	bushels.	bushels.
Lowan ..	14,585	166,269	11·40	16,336	147,160	9·01
Borung ..	34,600	410,760	11·87	29,900	253,680	8·48
Kara Kara ..	19,146	241,958	12·64	10,618	101,737	9·58
Weeah ..	2,080	16,657	8·01	2,380	16,607	6·98
Karkarooc ..	27,772	138,222	4·98	28,494	87,448	3·07
Tatchera ..	12,414	96,995	7·81	32,107	75,586	2·35
Gunbower ..	3,560	36,242	10·18	3,124	23,978	7·68
Gladstone ..	21,554	272,651	12·65	4,977	46,271	9·30
Bendigo ..	30,121	418,290	13·89	12,905	137,797	10·68
Rodney ..	30,582	421,558	13·78	19,351	208,223	10·76
Moira	48,714	591,234	12·14	64,914	594,846	9·16
Total ..	245,128	2,810,836	11·47	225,106	1,693,333	7·52

The quantity of manure imported during the year was 712,647 cwt., valued at £117,578. The quantity exported was 230,295 cwt., valued at £55,450.

The average yield of milk per cow steadily increased from 236 gallons in 1895 to 335 gallons in 1900, but it fell to 322·3 gallons in 1901, and to 273·9 gallons in 1902—a result in all probability due to droughts. In 1903-4 it was 336·2, and in 1904-5, 329·3. Dairy farms.

The following are the particulars respecting dairy farms in each of the last six years. In 1903-4 and 1904-5 the pastoral holdings are included:—

DAIRY FARMS: RETURN FOR SIX YEARS.

Year.	Number of Cow-keepers.	Number of Dairy Cows (wet and dry).	Milk Yield.		Number of Cream Separators in use.
			Average per Cow (wet and dry).	Total Quantity (000's omitted).	
			gallons.	gallons.	
1899	31,132	465,469	316·6	147,367,	3,446
1900	30,787	472,940	335·5	158,677,	4,131
1901	33,070	483,650	322·3	155,880,	5,626
1902	36,000	510,546	273·9	139,838,	7,308
1903	41,824	515,179	336·2	173,224,	8,986
1904	42,931	632,493	329·3	175,348,	13,408

Included in the 632,493 dairy cows, it is estimated that there were 478,918 milking, 53,575 dry, and 100,000 heifers, at the time of the collectors' visits.

Live stock.

The numbers of horses, cattle, sheep, and pigs in the various Australian States and New Zealand, according to the latest returns, are:—

LIVE STOCK RETURN FOR AUSTRALASIA, 1904.

(Final figures for Victoria, New South Wales, Queensland, Tasmania, and New Zealand.)

State.	Horses.	Cattle.		Sheep.	Pigs.
		Milch Cows.	Other.		
Victoria	372,397	632,493	1,062,483	10,167,691	286,070
New South Wales ..	482,663	556,531	1,610,598	34,526,894	330,666
Queensland	413,165	2,722,340		10,843,470	185,141
South Australia	183,481	88,156	184,303	5,820,301	111,497
,, N. Territory	15,763	202	291,068	51,538	1,085
Western Australia ..	90,102	27,721	533,193	2,856,200	69,960
Tasmania	36,565	50,230	151,976	1,556,460	77,943
New Zealand	314,322	498,241	1,238,609	18,280,806	255,320

Live stock—Census returns, 1861 to 1901.

The differences, for the most part increases, in the numbers of horses, cattle, sheep, and pigs, in each census year since 1861, are shown in the following table; together with the number per head of the population at each period. The progress of the industries dependent on the breeding of stock are thus indicated:—

LIVE STOCK PER HEAD OF POPULATION: RETURN FOR FIVE CENSUS YEARS.

Stock.	1861. Population 540,322.		1871. Population 731,528.		1881. Population 862,346.		1891. Population 1,140,405.		1901. Population 1,201,341.	
	Number.	Per Head of Population.	Number.	Per Head of Population.	Number.	Per Head of Population.	Number.	Per Head of Population.	Number.	Per Head of Population.
Horses (including foals) ..	76,536	·14	209,025	·29	275,516	·32	436,469	·38	392,237	·33
Cattle—										
Milch Cows	197,332	·37	212,193	·29	329,198	·38	395,192	·35	521,612	·43
Other ..	525,000	·97	564,534	·77	957,069	1·11	1,387,689	1·22	1,080,772	·90
Sheep ..	5,789,896	10·70	10,477,976	14·32	10,360,285	12·01	12,692,843	11·13	10,841,790	9·03
Pigs ..	61,259	·11	180,109	·25	241,936	·28	282,457	·25	350,370	·29

The animals are here averaged to the number of inhabitants of Victoria, a continually changing quantity. In the next table they are averaged to a constant quantity—the number of square miles in the State. The actual percentage increases are thus shown:—

LIVE STOCK PER SQUARE MILE: RETURN FOR FIVE CENSUS YEARS.

Year.	Average per Square Mile (Area of Victoria, 87,884 Square Miles).				
	Horses.	Cattle.		Sheep.	Pigs.
		Milch Cows.	Other.		
1861	·87	2·25	5·97	65·78	·70
1871	2·38	2·41	6·42	119·22	2·05
1881	3·14	3·75	10·89	117·88	2·75
1891	4·97	4·50	15·79	144·43	3·21
1901	4·46	5·94	12·30	123·36	4·00

The increase in each class was constant up to 1891, with the exception of a slight fall in the number of sheep between 1871 and 1881. Between the census of 1891 and 1901, however, there has been a reduction in the numbers of horses, cattle generally, and sheep, probably due to the many dry seasons in the intercensal period. There was also an exceptional export of horses to South Africa for some time prior to the 1901 census. The number of milch cows increased considerably in the decade, indicating the growth of the dairying industry, and explaining in part the largely augmented output of butter. The number of pigs has steadily and satisfactorily increased throughout all the intercensal periods. As the development of Victoria proceeds on agricultural and dairying lines, reductions may be expected in the number of cattle, other than milch cows, and in the number of sheep depastured in the State.

Live stock, 1901 and 1904.

It has not been the practice in Victoria to collect the numbers of the live stock, except in those years in which the census was taken. Arrangements were, however, made to collect the information for 1904, and the results placed side by side with the census figures of 1901, are as follow:—

LIVE STOCK: 1901 AND 1904.

Live Stock.	Census, 1901.	1904.	Increase.	Decrease.
	No.	No.	No.	No.
Horses (including foals) ..	392,237	372,397	..	19,840
Cattle—				
Dairy, Milking and Dry ..	521,612	632,493	110,881	..
Others	1,080,772	1,062,483	..	18,289
Sheep	10,841,790	10,167,691	..	674,099
Pigs	350,370	286,070	..	64,300

The decrease in the horses is probably attributable to drought. A portion of the increase in dairy cattle is, perhaps, more apparent than real, forasmuch as the collection in the past year has been made under two headings, viz., "Milking dairy cattle" and "Dry dairy cattle," whereas at the census the collection was only made under one heading, "Milch cows," when many of the dry dairy stock were probably included among other cattle. The decrease in other cattle is, therefore, partly accounted for by the present better collection of dairy stock, and to some extent by the drought. The decrease in the number of sheep may be entirely attributed to drought; and the decrease in the number of pigs to losses sustained through an epidemic, which has been more or less prevalent during the past few years. Reference to this epidemic is made by Dr. A. A. Brown in his paper on "Diseases Prevailing in the Live Stock of Victoria," page 464, *supra.*

Prices of stock.

In the following table will be found a statement of the average and range of prices obtaining in Melbourne during the year 1904. The information has been extracted from the Melbourne "Stock and Station Journal," and may be regarded as approximately correct:—

PRICES IN MELBOURNE OF LIVE STOCK FOR THE YEAR 1904.

Live Stock.	Prices in 1904.		
	Average.	Range.	
	£ s. d.	£ s. d.	£ s. d.
Horses—			
Extra heavy Draught	41 1 0	37 10 0 to	46 0 0
Medium	27 2 0	20 10 0 to	32 10 0
Light Cart (order cart)	12 17 0	10 0 0 to	19 10 0
Indian Remounts	27 12 0	23 0 0 to	35 0 0
Artillery	32 14 0	27 10 0 to	38 10 0
Saddle and Harness	9 3 0	6 15 0 to	11 10 0
Carriage, per pair	156 3 0	115 10 0 to	173 5 0
Ponies (phaeton), per pair	40 14 8	30 0 0 to	55 0 0
Fat Cattle—			
Bullocks—			
Extra Prime	13 11 6	11 15 0 to	14 15 0
Prime	12 1 6	10 15 0 to	13 0 0
Good	10 4 0	8 15 0 to	11 10 0
Good Light and Handy Weights	8 17 4	6 17 6 to	10 2 6
Second	7 0 9	5 10 0 to	8 5 0
Cows—			
Best	8 13 6	6 15 0 to	10 12 6
Others	6 7 4	5 0 0 to	7 15 0
Calves—			
Prime Steers and Heifers	4 17 2	3 12 6 to	5 17 6
Prime Calves	3 0 4	2 2 6 to	3 15 0
Other Good	2 2 3	1 8 0 to	2 15 0

PRICES IN MELBOURNE OF LIVE STOCK FOR THE YEAR 1904—*continued.*

Live Stock.	Prices in 1904.		
	Average.	Range.	
Dairy Cattle—	£ s. d.	£ s. d.	£ s. d.
Best Milkers	10 4 10	7 17 6 to	12 15 0
Good	8 0 10	6 5 0 to	10 5 0
Medium	6 6 3	4 10 0 to	8 5 0
Inferior	4 18 6	4 0 0 to	6 0 0
Springers, best	8 12 5	7 7 6 to	10 0 0
Heifers, best Springers	6 17 2	3 2 6 to	8 2 6
Dry Cows	4 9 7	3 12 6 to	5 14 0
Stores	3 11 4	3 0 0 to	4 2 6
Fat Sheep—			
Extra Prime Cross Wethers	1 3 8	0 17 4 to	1 7 4
Prime	1 0 8	0 14 6 to	1 3 4
Good	0 18 3	0 14 0 to	0 19 6
Extra Prime Cross Ewes	1 1 0	0 15 9 to	1 7 4
Prime	0 18 3	0 13 9 to	1 1 6
Good	0 15 11	0 12 9 to	0 18 0
Prime Merino Wethers	0 19 7	0 14 9 to	1 3 0
Good	0 16 10	0 13 0 to	0 19 6
Merino Ewes	0 14 6	0 10 6 to	0 18 6
Fat Lambs—			
Extra Prime	0 17 5	0 15 0 to	1 3 0
Prime	0 14 11	0 12 6 to	0 17 3
Good	0 12 8	0 11 0 to	0 14 9
Second	0 10 6	0 8 9 to	0 12 6
Pigs—			
Back Fatters—			
Extra Heavy Prime	4 5 1	2 17 0 to	5 5 0
Extra Prime and Weighty	3 0 1	2 10 0 to	3 12 6
Baconers—			
Extra Prime	2 16 1	2 7 0 to	3 4 0
Prime	2 10 9	2 0 0 to	3 1 6
Porkers	1 15 0	1 5 0 to	2 4 9
Stores	1 7 4	0 18 0 to	1 19 0
Slips	0 17 8	0 12 0 to	1 7 0
Suckers	0 12 8	0 8 0 to	0 19 6

The following return shows the proportion of live stock per square mile in the various States of the Commonwealth and New Zealand in 1901 :— Live stock per square mile, Australasia.

State.	Horses.	Cattle.		Sheep.	Pigs.
		Milch Cows.	Other.		
Victoria	4·46	5·94	12·30	123·36	4·00
New South Wales	1·57	1·34	5·25	134·72	·86
Queensland	·69	5·64		15·00	·18
South Australia—Proper	·43	·20	·39	13·19	·23
„ Northern Territory	·02	·002	·48	·09	·002
Western Australia	·08	·40		2·61	·06
Tasmania	1·24	1·56	4·87	68·38	2·24
New Zealand	2·68	3·65	·938	193·67	2·14

Stock slaughtered.

The return of the stock slaughtered for 1904 was partly furnished by the municipal authorities, and partly collected by the police. The number includes those slaughtered on farms and stations, as well as those in municipal abattoirs. Previous to 1903, the returns were furnished solely by the municipal authorities, an estimate being made of the stock slaughtered privately:—

STOCK SLAUGHTERED: RETURN FOR FIVE YEARS.

Year.	Numbers Slaughtered.		
	Sheep and Lambs.	Cattle and Calves.	Pigs.
1900	2,371,415	248,797	231,752
1901	2,469,797	251,477	261,479
1902	2,827,938	233,206	224,431
1903	2,652,569	235,284	164,745
1904	2,305,729	243,937	191,311

The purposes for which the carcases of the slaughtered animals were used were:—

Year.	For Butcher and Private Use.			For Freezing.			For Preserving and Salting.			For Boiling Down.		
	Sheep.	Cattle.	Pigs.	Sheep.	Cattle.	Pigs.	Sheep.	Cattle.	Pigs.	Sheep.	Cattle	Pigs.
1900	1,921,284	244,571	119,137	437,332	3,808	..	9,181	115	112,604	3,618	303	11
1901	2,106,863	249,079	134,276	431,740	980	..	10,087	937	127,145	11,107	481	58
1902	2,337,262	229,728	106,390	378,029	2,293	..	13,211	485	117,984	99,436	705	57
1903	2,337,958	231,682	52,681	294,906	1,630	4,200	11,400	1,473	107,754	8,305	499	110
1904	1,843,894	242,276	67,302	459,963	720	3,200	1,095	699	120,758	777	242	51

Wool production—Victoria.

The total production of wool, being the quantity made up in manufacturing in the State, and that returned by the Customs Department as having been exported, is given for the years 1899-1904. The quantity and value of wool imported and exported, and the quantity and value of that used for home consumption, are also shown:—

WOOL: RETURN FOR SIX YEARS.

Year	Wool Imported.		Wool Exported.		Wool Used in Manufactures in the State.			Wool Production—Greasy and Scoured.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Rate per lb.	Value.	Quantity.	Value.
	lbs.	£	lbs.	£	lbs.	s. d	£	lbs.	£
1899	63,067,135	2,351,059	121,877,604	5,701,410	2,867,884	1 0	143,394	61,678,353	3,493,745
1900	62,527,987	1,927,677	102,205,965	4,217,018	3,045,292	0 6	76,132	42,723,270	2,365,163
1901	61,796,450	1,840,066	131,623,062	4,350,285	3,408,526	0 6	85,213	73,235,138	2,595,432
1902	38,008,765	1,141,715	100,516,094	3,473,372	3,473,835	0 8	115,794	65,981,164	2,447,451
1903	36,726,396	1,381,647	84,560,603	3,186,054	3,772,390	0 9	141,164	51,606,597	1,945,871
1904	51,449,037	2,076,958	123,208,133	5,452,973	4,027,080	0 10	167,795	75,786,176	3,543,810

The quantity and value of wool produced in 1903 in the various Australian States and New Zealand, estimated on the same principle, were: — Wool production—Australasia.

	Quantity. (Greasy, Washed, and Scoured.) lbs.	Value. £
Victoria	51,606,597	1,945,872
New South Wales	187,967,787	8,547,749
Queensland	34,978,584	1,877,027
South Australia	35,766,993	1,239,744
Western Australia	12,907,065	443,743
Tasmania	5,797,655	208,847
New Zealand	159,568,919	4,210,138

The 1903 figures have been inserted, as the information for some of the other States for 1904 is not at present procurable.

The following information as to the average rates of wool per lb. obtaining for the last season has been extracted from Messrs. Goldsbrough, Mort, and Co.'s annual review for 1903-4:— Price of wool.

Greasy Merino.	
Extra Super (Western District)	up to 17¾d.
Superior	13½d. to 15d.
Good	10½d. to 12d.
Average	9½d. to 10½d.
Wasty and Inferior	6½d. to 8½d.
Extra Super Lambs	up to 17¾d.
Super Lambs	11½d. to 13½d.
Good Lambs	10d. to 11d.
Average Lambs	8½d. to 9½d.
Inferior Lambs	4½d. to 6d.
Greasy Crossbred.	
Extra Super Comebacks	up to 15¼d.
Super Comebacks	12d. to 13d.
Fine Crossbred	10½d. to 11½d.
Medium Crossbred	9d. to 10½d.
Coarse Crossbred and Lincoln	9d. to 10d.
Superior Fine Crossbred and Lambs	11d. to 13d.
Good Crossbred Lambs	9d. to 10½d.
Coarse and Lincoln and Lambs	7½d. to 8½d.
Scoureds.	
Extra Super Fleece	up to 23¼d.
Super Fleece	21d. to 22d.
Good Fleece	19d. to 20d.
Average Fleece	18d. to 19d.
Record Prices for the Season.	
Greasy Merino Fleece	17¾d.
" Comeback Fleece	15¼d.
" Merino Lambs	17¾d.
" Comeback Lambs	13d.
Scoured Fleece	23¼d.

Dealing with the character of the clip, the following remarks are made:—"There can be no doubt that the clip now going into consumption, taken all round, was a better one than has been seen for several seasons past, whether judged from its style, growth, or yield. This was naturally to be expected, as the conditions under which it was grown were exactly the reverse to those existing during the long protracted period of drought. The Western District of Victoria produced The 1904 clip.

a clip which for general excellence, style, condition, quality, length, and density, has had few equals, certainly no superior, and although wools from this favoured locality invariably show good results as regards yields, it is admitted on all sides that this year's production was much above the average in this respect."

Hands employed on farms, &c.

Of the total number of hands, 142,329, engaged in farming, dairying, and pastoral pursuits during 1904, 90,396 were males and 51,933 were females. 53,933 males and 27,166 females were engaged in farming principally; 21,509 males and 18,623 females in dairying principally; and 14,954 males and 6,144 females in pastoral pursuits principally. The number of hands ordinarily employed on any holding includes the occupier or manager, and those members of his family who actually work on it; but persons absent from their farms for the greater portion of the year, following other occupations, as well as temporary hands engaged harvesting, &c., are not included, neither are domestic servants and cooks.

In the following return will be found particulars showing the rates of wages paid (with rations) upon farms and pastoral holdings during 1904. The information has been furnished by the occupiers of holdings:—

WAGES, AGRICULTURAL AND PASTORAL, 1904.

Occupations.	Range.	Prevailing Rate.
Ploughmen	10s. to 30s. per week ..	20s. per week
Farm labourers	12s. to 30s. ,, ..	15s. ,,
Threshing machine hands ..	6d. to 9d. per hour ..	6d. per hour
Harvest hands	3s. 4d. to 7s. per day ..	5s. and 6s. per day
Milkers	10s. to 25s. per week ..	15s. per week
Maize pickers (without rations)	4d. to 6d. per bag ..	4d. per bag
Hop pickers ,, ,,	4d. to 5d. per bushel ..	4d. per bushel
Married couples	15s. to 35s. per week ..	27s. 6d. per week
Female servants	8s. to 16s. ,, ..	10s. ,,
Men cooks	12s. to 30s. ,, ..	20s. ,,
Stockmen	£40 to £52 per annum ..	£52 per annum
Boundary riders	£25 to £52 ,, ..	£40 ,,
Shepherds	£25 to £52 ,, ..	£35 ,,
Hut keepers	£26 to £52 ,, ..	£35 ,,
Generally useful men ..	12s. 6d. to 30s. per week..	17s. 6d. per week
Sheep washers	15s. to 25s. ,, ..	17s. 6d. ,,
Shearers, hand*	14s. to 20s. per 100 sheep	15s. per 100 sheep
,, machine* ..	14s. to 20s. ,,	15s. ,,
Bush carpenters	20s. to 48s. per week ..	30s. per week
Gardeners, market ..	15s. to 30s. ,, ..	22s. 6d. ,,
,, orchard ..	15s. to 30s. ,, ..	20s. ,,
Vineyard hands	10s. to 20s. ,, ..	15s. ,,

* It is believed that in cases of some of the highest rates rations are not found.

Ensilage.

The importance of the preservation of forage in a green state is so great that public attention to the question is highly desirable. Not only will stock eat anything of a vegetable nature that will make useful ensilage, but ensilage-fed animals at all times present an appearance of health and vigour. It cannot be affirmed that the uncertainty

of the result of the system need militate against the trial. The silo is no longer in an experimental stage. Ancient nations are known to have practised the preservation of forage and fruits in a green state in large subterranean vaults; and during the last twenty years experiments on a large scale have been carried on, particularly in America, where the almost universal testimony of farmers is to its economy in feeding cattle, and the consequent increased stock-carrying capacity of the land. As a result of these experiments, many farmers have introduced silos upon their holdings, but it is a matter of surprise that so little has been done in Australia. Dr. Cherry, in a paper on "The Modern Silo," published as Bulletin No. 8 of the Department of Agriculture of Victoria, points out particularly that "animals which chew the cud differ from all other classes in requiring their food comparatively juicy and bulky. Their digestive apparatus is formed to suit this kind of food. Hence the cow or bullock cannot thrive on exclusively dry food so well as a horse." In Victoria, where every season the rapid drying up of the grass under the excessive heat of the summer sun causes large areas of pasture land to be parched and grassless, and green food usually disappears from December till autumn — an artificial method of preserving fodder should be of the utmost possible benefit, and the advantage of the luxuriance of trefoil, grasses, and self-sown crops in the spring would not then be lost. The juicy state in which the silo preserves ensilage fulfils another of the requirements of ruminant animals, that their food should be presented in a succulent condition. A supply of such nutriment in the winter, judiciously mixed with drier protein-bearing food, or with grain, bran, oil cake, &c., means to the farmer and stock-raiser an economizing of green stuffs when their luxuriance would otherwise tend to wastefulness, a steady and assured food supply for the summer, and a consequent augmentation, not only of the quantity, but also of the quality, of the milk yielded. Even in districts where fresh green fodder is available throughout the greater part of the year, the advantage of being able to secure the crop when it is in its best condition seems so evident, that the silo should soon become an indispensable adjunct on every farm.

Notwithstanding the importance of this means of preserving food for stock for use in dry seasons, the following figures for Victoria will show how little has been done in this direction up to the present:—

In 1898-9, ensilage was returned as having been made on 224 farms, using 8,764 tons of material; in 1899-1900, on 139 farms, using 9,116 tons; in 1900-1, on 131 farms using 5,834 tons; in 1901-2, on 125 farms, using 5,065 tons; and in 1902-3, on 111 farms, using 4,703 tons. An improvement is shown for 1903-4, when ensilage was made on 290 farms, and the material used was 10,931 tons; and a further improvement for the past year, the return showing that 12,779 tons were made on 300 farms.

Bee-keeping.

The returns for 1904-5 show that there were 6,494 bee-keepers, owning 24,003 frame and 25,117 box hives, and producing 1,510,014 and 396,174 lbs. of honey respectively, and 28,653 lbs. of beeswax.

The number of bee hives has increased from 21,412 in 1900-1, to 49,120 in 1904-5.

In 1891-2, the quantity of honey returned was 1,128,283 lbs. After a decline in the next two years, the quantity gathered in 1894-5 was 1,323,982 lbs. A further falling off is recorded from that year to 195,163 lbs. in 1897-8. A recovery has since been made, the return for 1904-5 indicating that the industry is now making rapid progress.

BEE-KEEPERS: RETURN FOR FIVE YEARS.

Season.	Number.	Bee Hives.	Honey.	Beeswax.
			lbs.	lbs.
1900-1	2,293	21,412	957,020	15,269
1901-2	3,776	22,083	572,477	13,530
1902-3	4,402	32,126	1,199,331	23,061
1903-4	5,609	40,759	833,968	18,979
1904-5	6,494	49,120	1,906,188	28,653

Annual value of poultry production.

Poultry production hitherto has not been considered of sufficient importance to warrant its inclusion amongst the prominent industries of the State, but the annual value of that production has in reality attained dimensions that must be taken into consideration.

An attempt has been made in this office, guided by the opinions of experts and others practically engaged in the business, to obtain an approximation of the value of such annual production.

The numbers of the various kinds of poultry in the State at the date of the last census—31st March, 1901—as ascertained from the schedules, were as follow:—

Fowls	3,619,938
Ducks	257,204
Geese	76,853
Turkeys	209,823

Adequate allowances having been made for male birds and non-layers, and accepting evidence with regard to the average number of eggs laid by the birds—such estimates being 80 per annum per laying fowl and duck, ten hatched and reared birds to each goose, and eight to each turkey hen kept for breeding purposes—the gross annual value of poultry production has been estimated to be as follows:—

Fowls—Eggs	£665,000	
Birds for consumption ...	456,150	
		£1,121,150
Ducks—Eggs	£68,600	
Birds for consumption ...	51,400	
		120,000
Geese—For consumption	...	61,400
Turkeys—For consumption ...	...	189,000
Total	...	£1,491,550

The following table shows the number of poultry and poultry-owners as ascertained at the censuses of 1881, 1891, and 1901 :— Poultry and poultry-owners at census, 1881, 1891, and 1901.

POULTRY: RETURN FOR THREE CENSUS YEARS.

Census.	Poultry-owners.	Fowls.	Ducks.	Geese.	Turkeys.
1881	97,152	2,332,529	181,698	92,654	153,078
1891	142,797	3,487,989	303,520	89,145	216,440
1901	132,419	3,619,938	257,204	76,853	209,823

It thus appears that there has been a falling off in the number of poultry-owners since 1891, and although fowls show a slight increase, there has been a diminution in the other kinds of poultry. In view of the present interest taken in the results of laying competitions, and of the profits which proper attention and knowledge secure from both fowls and ducks, large increases may be expected in the numbers of owners and of poultry stock in the immediate future.

Active operations for the destruction of rabbits on Crown lands were first undertaken by the Government in 1880, and from that date to the mddle of 1903 sums amounting to £430,181 had been expended with that object. The following are the amounts spent in each year:— State expenditure on rabbit destruction.

	£		£
1879-80	1,280	1892-3	30,595
1880-1	2,600	1893-4	12,514
1881-2	12,890	1894-5	8,909
1882-3	9,883	1895-6	11,831
1883-4	10,063	1896-7	13,425
1884-5	22,177	1897-8	14,303
1885-6	24,833	1898-9	14,753
1886-7	21,065	1899-00	14,480
1887-8	20,551	1900-1	15,300
1888-9	17,621	1901-2	16,800
1889-90	24,860	1902-3	16,000
1890-1	37,913	1903-4	16,000
1891-2	39,535		

The whole of the State, with the exception of portions of Gippsland, is more or less infested with rabbits and other vermin. In addition to the expenditure of £430,181, referred to above, a loan of £150,000 was allocated to shires in 1890 for the purchase of wire netting to advance to land-holders, repayable in ten years, and in 1896 a loan of £50,000 was advanced on similar terms, except that 3 per cent. interest was added. The expenditure for 1903-4 was £16,000, portion of which represents the salaries and allowances paid to 31

rabbit inspectors, 11 police inspectors who were partially employed, and from 30 to 40 men who were wholly employed on Crown lands. The fines and costs amounted to £338 18s. 11d. in 1902, to £280 11s. in 1903, and £253 in 1904.

Rabbits and wildfowl sent to market in Melbourne.

The number of couples of rabbits and brace of wildfowl received at the Melbourne Fish Market, the number sold, and the number condemned, during the last five years, were as follow:—

RABBIT AND WILD-FOWL: RETURN FOR FIVE YEARS.

Year.	Number of Couples of Rabbits.			Brace of Teal and Duck.		
	Sold.	Condemned.	Total.	Sold.	Condemned.	Total.
1900 ..	480,519	5,727	486,246	35,610	728	36,338
1901 ..	596,610	2,717	599,327	59,156	930	60,086
1902 ..	471,964	4,472	476,436	32,756	232	32,988
1903 ..	316,462	3,810	320,272	13,130	80	13,210
1904 ..	402,944	3,952	406,896	49,556	178	49,734

In 1903 there were also received at the Melbourne Market 1,499 brace of hares—of which 33 brace were condemned, and the others sold. In addition, the following passed through the Melbourne Council's refrigerating works during the twelve months ended 31st December, 1904, for export only:—1,639,236 pairs of rabbits, 1,648 brace of hares, and 11,317 brace of game.

The fishing industry.

For some years past, no statistical information as to the value of the Victorian fishing industry has been included in the statistics published by this office. As the industry is regarded as one of growing importance, effort has been made, during the past year, to obtain reliable information as to its extent, and the results are contained in the statements which follow. The first shows the various fishing districts round the coast, the number of men and boats engaged, and the value of the general fishing plant in use. The second shows the approximate weight of fish caught in the various waters, and sent to the Metropolitan, Ballarat, and other markets of the State during the year. It thus appears that in 1904, 1,089 men were engaged in fishing; the number of boats in use was 654; and their estimated value, £23,428. The value of the nets and other plant amounted to £11,182. The approximate weight of the fish sold (excluding condemned fish) was 12,728,764 lbs. There were also 20,560 dozen

crayfish sold, and the estimated value of both was £75,023. In addition, there were 1,339,660 lbs. of fish, 35,874 bushels of oysters, and 807 dozens of crayfish, of £32,457 value, imported from other States, sold in the Victorian markets. A statement of such imports is added:—

Fisheries.

Return for the years 1903 and 1904, showing fishing districts, the number of men and boats employed, and the value of boats, nets, and other plant in use.

District	1903.				1904.			
	Number of Men.	Boats. Number.	Boats. Value.	Value of Nets and other Plant.	Number of Men.	Boats. Number.	Boats. Value.	Value of Nets and other Plant.
			£	£			£	£
Apollo Bay	5	2	22	40	2	1	20	10
Anderson's Inlet	11	6	114	160	7	6	64	107
Barwon Heads and Ocean Grove	22	12	443	55	21	8	340	78
Brighton	6	5	68	114	7	7	292	77
Corner Inlet, Welshpool, and Toora	63	39	3,570	1,711	63	39	3,570	1,711
Dromana	10	9	146	66	16	15	313	110
Echuca	6	6	14	18	8	8	16	24
Frankston	12	11	129	39	6	6	77	48
Geelong	74	36	976	675	76	41	1,168	802
Gippsland Lakes	272	183	4,198	2,441	274	185	4,243	2,532
Lorne	7	4	87	95	5	4	96	55
Mentone	11	7	44	53	13	9	70	52
Mordialloc	10	10	211	99	12	11	294	142
Mornington	24	14	389	345	24	14	371	370
Portarlington and St. Leonards	64	35	1,140	470	64	35	1,140	490
Portland	60	34	2,105	916	67	36	1,985	843
Port Albert	41	26	601	382	54	29	804	456
Port Fairy	65	33	1,512	373	74	36	2,106	593
Port Melbourne	29	15	379	270	24	13	415	270
Queenscliff	93	48	3,127	521	89	46	3,504	545
Sandringham	19	10	183	96	14	11	163	53
Sorrento, Portsea, and Rye	34	47	1,020	425	27	20	652	144
St. Kilda	10	4	35	115	6	3	44	50
Warrnambool	10	5	172	77	10	8	163	210
Western Port: Cowes, Hastings, Flinders, San Remo, and Tooradin	103	56	1,570	912	94	47	1,200	1,190
Williamstown	23	14	288	152	32	16	318	220
Total	1,084	651	22,543	10,620	1,089	654	23,428	11,182

Return of fish caught in Victorian waters and sold in the Melbourne and Ballarat Fish-markets and elsewhere during the years 1903 and 1904.

Market.	1903.				1904.			
	Quantity of—		Value of—		Quantity of—		Value of—	
	Fish.	Crayfish.	Fish.	Crayfish.	Fish.	Crayfish.	Fish.	Crayfish.
	lbs.	doz.	£	£	lbs.	doz.	£	£
Melbourne ..	11,413,340	16,919	63,407	5,640	11,618,040	18,734	62,240	7,467
Ballarat ..	1,161,440	663	5,510	298	681,280	807	3,649	282
Elsewhere ..	501,266	1,241	1,335	320	429,444	1,019	1,120	265
Total ..	13,076,046	18,823	70,252	6,258	12,728,764	20,560	67,009	8,014

Return for 1903 and 1904, showing the quantity and value of fresh fish and oysters imported into Victoria.

Market.	1903.						1904.					
	Quantity of—			Value of—			Quantity of			Value of—		
	Fish.	Crayfish.	Oysters.	Fish.	Crayfish.	Oysters.	Fish	Crayfish.	Oysters.	Fish.	Crayfish.	Oysters
	lbs.	doz.	bush.	£	£	£	lbs.	doz.	bush.	£	£	£
Melbourne	1,897,930	..	34,755	23,724	..	14,481	1,155,180	..	35,874	14,439	..	14,944
Ballarat ..	247,094	435	..	3,089	163	..	184,480	540	..	2,792	189	..
	2,145 024	435	34,755	26,813	163	14,481	1,339,660	540	35,874	17,231	189	14,944

Farm implements.

For the first time for many years the number of engines, horse-works, and machinery, and other implements on agricultural, dairying, and pastoral holdings was ascertained at the time of the collectors' visits in 1905. The number of each kind is shown in the following table:—

MACHINERY AND IMPLEMENTS ON FARMS AND PASTORAL HOLDINGS IN EACH DISTRICT, 1905.

Districts.	Number of Engines.		Number of Horse-works.	Number of —										
	Steam.	Oil.		Threshing Machines.	Winnowing Machines.	Harvesters.	Reapers and Binders.	Strippers.	Ploughs.	Harrows.	Cultivators.	Grain Drills.	Chaffcutters.	Cream Separators.
Central ..	390	71	1,542	75	275	..	2,335	..	13,014	9,453	4,007	1,225	4,657	3,274
North-Central	215	19	1,054	45	355	75	1,973	63	5,225	3,687	933	909	2,018	1,209
Western ..	191	109	1,333	65	232	263	2,036	81	6,958	5,307	1,327	786	2,488	1,159
Wimmera ..	89	48	2,716	62	2,690	965	2,721	4,193	8,215	6,435	2,433	2,807	3,230	876
Mallee ..	85	11	600	17	1,544	207	648	2,672	3,251	1,818	1,459	826	753	436
Northern ..	589	44	2,041	158	3,551	2,493	5,102	4,017	12,493	8,888	3,990	3,485	3,140	2,581
North-Eastern	199	18	773	54	393	134	1,143	414	4,393	2,826	677	460	1,407	640
Gippsland ..	320	28	578	66	136	..	609	..	5,957	4,856	1,669	326	1,570	3,233
Total ..	2,078	348	10,637	542	9,176	4,137	16,567	11,440	50,506	43,270	16,495	10,824	19,263	13,408

MINING.

Loan expenditure in aid of mining industry.

In addition to the sums annually voted in aid of the mining industry of the State, the sum of £272,996 was authorized to be raised by way of loan, of which £271,030 was apportioned. Of this latter sum, £270,387 was expended up to 30th June, 1904, leaving £643 of the apportioned money unexpended.

Provision was made by the *Mining Development Act* No. 1461, of 14th December, 1896, and by Acts amending the same, as follows:—

1. To subsidize mining companies to enable them to further develop gold-mining, and for other purposes. Under this Act a company could apply for a loan for the purposes of carrying on pioneer mining, procuring machinery, working plant, or appliances, for carrying on such pioneer mining, and for erecting, fitting up, or connecting the same, and for providing all works necessary for the proper carrying on of such pioneer mining. After fully examining each claim, and being satisfied as to the representations made, the Government may advance, by way of loan, to any one company, a sum or sums not exceeding on the whole the amount of £10,000. The aggregate of such advances is not to exceed £139,000, or £39,000 in any one financial year. The loans shall be payable in instalments to be specified in an agreement, and a company borrowing shall pay interest to the Treasurer at the rate of 3½ per cent. by half-yearly payments. The Treasurer will hold a first mortgage over all the property of the company, and the payments to the Treasurer provided by the agreement shall form a first charge upon all profits and assets, excepting uncalled capital. In case of default on the part of a company, the Treasurer is empowered to enforce all or any of the remedies set forth in the Act, or in the agreement.

2. For the construction of roads and tracks for mining, where, in the opinion of the Departmental officers, advantage and benefit would thereby accrue to a satisfactory number of miners and people of the district engaged in other occupations, a sum of £90,000 (but not more than £15,000 in any one year) may be spent. The roads, when made, are to be kept open for public use, and free from obstruction by the shire councils.

3. The expenditure of £13,000 (but not more than £3,500 in any one year) is authorized for the purchase and erection of machinery, plant, and appliances for testing the value of metalliferous material. Charges for testing, as prescribed by regulations under the Act, may be made.

4. The expenditure of £19,000 (but not more than £4,000 in any one year) is authorized for the construction, subject to existing rights, of races and dams for working alluvial deposits for gold, and to divert water for such uses, where, in the opinion of the Departmental officers, mining operations can be profitably carried on.

5. The expenditure of £35,000 (but not more than £10,000 in any one year) may be advanced to miners for prospecting. Any two or more persons applying to the Minister may have advanced to them, by way of loan for assisting them to prospect for gold or other minerals or metals, a sum not exceeding £250. The Minister must be satisfied that the men are working miners, that there is security for the repayment of the sum advanced, and that the applicants will spend pound for pound of the sum advanced.

6. The sum of £8,000 is authorized for disseminating information and instruction in Great Britain and other countries, as to the State's mining resources and capabilities, and for holding public exhibitions of mining machinery and appliances.

The manner in which the total sum of £270,387, spent up to 30th June, 1904, was allocated, is shown in the following statement:—

RETURN SHOWING ALLOCATION OF LOAN MONEY EXPENDED ON MINING ENTERPRISE, TO 30TH JUNE, 1904.

Loan Act.	Allocated under Act.	Purpose for which Allocation was made.	Amount.
			£
1451	1461	Advances to companies for development of mining ..	58,523
,,	,,	Construction of roads and tracks for mining ..	42,390
,,	,,	Plant for testing metalliferous material	11,922
,,	,,	Construction of races and dams for water for sluicing for gold	5,709
,,	,,	Advances for miners for prospecting	17,011
,,	,,	Disseminating information; exhibition expenses ..	3,368
,,	1806	Removal and re-erection of testing plants	436
1564	1566	Advances for draining metalliferous areas ..	18,008
,,	,,	Reservoir, Creswick Back Creek	249
,,	,,	Advances to miners for prospecting	3,152
,,	,,	Disseminating information; equipment of School of Mines and purchase of Cyanide process patent rights	23,043
,,	1882	Advance to mining company for pioneer operations ..	230
1623	1566	Draining metalliferous areas, advance to company, and expenses	3,862
,,	,,	Construction of roads and tracks	20
,,	,,	Construction of races and dams	704
,,	,,	Advances for prospecting	1,562
,,	,,	Disseminating mining information and equipping School of Mines	2,860
,,	1882	Advances to miners, companies, draining and track-cutting, and disseminating information	1,054
1659–1713	1566	Advances to companies: draining	18,768
,,	,,	Construction of roads and tracks	9,247
,,	,,	Construction of races and dams	810
,,	,,	Advances for prospectors	4,381
,,	,,	Disseminating information: School of Mines equipment	5,998

RETURN SHOWING ALLOCATION OF LOAN MONEY EXPENDED ON MINING ENTERPRISE, TO 30TH JUNE, 1904—*continued.*

Loan Act.	Allocated under Act.	Purpose for which Allocation was made.	Amount.
			£
1713	1767	Purchase and equipment of building for metallurgical work	40
1753	1566	Advances to companies: draining	4,650
,,	,,	Construction of roads and tracks	1,634
,,	,,	Construction of races and dams	682
,,	,,	Advances for prospectors	55
,,	,,	Disseminating information: School of Mines equipment	540
,,	1767	Purchase and equipment of building for metallurgical work	630
1800	,,	Purchase and equipment of building for metallurgical work	1,777
,,	1806	Advances to companies	20,032
,,	,,	Construction of roads and tracks	4,245
,,	,,	Construction of races and dams	107
,,	,,	Advances to prospectors	1,670
,,	,,	Disseminating information: School of Mines equipment	1,018
		Total	270,387

The amount of loan money spent during 1903-4 was £7,518.

Ordinary mining revenue and expenditure.

The following are the ordinary receipts from, and expenditure on, mining during the financial year 1903-4:—

MINING REVENUE AND EXPENDITURE, 1903-4.

Revenue.	Amount.	Expenditure.	Amount.
	£		£
Leases of auriferous and mineral land	12,440	Mining Department—	
Miners' rights	4,023	Salaries	17,956
Fees	1,551	Contingencies	5,746
Hire of drill boring plant and crushing batteries ...	837	Mining boards	3,500
Royalties — Cyanide Patents Purchase Act	3,481	Purchase and working of diamond drills	4,993
Value of diamonds lost while boring	129	Testing plants	2,358
Mining Development Act—		Victorian coal—Allowance to Railway Department for carriage and use of ...	5,099
Repayment of loans ...	4,029	Geological and underground surveys of mines	5,450
Payment of interest on loans	1,365	Miscellaneous	873
Total	27,855	Total	45,975

The following table gives particulars of the expenditure in aid of the mining industry during each of the five financial years ended with 1903-4:—

EXPENDITURE ON MINING: RETURN FOR FIVE YEARS.

—	1899-00.	1900-1.	1901-2.	1902-3.	1903-4.
	£	£	£	£	£
Mining Department	34,827	36,208	36,305	35,815	23,702
Mining boards	3,500	3,500	3,500	3,500	3,500
Victorian coal—Allowance to Railway Department on carriage of	15,000	13,146	9,946	5,568	5,099
Diamond drills for prospecting Testing plants	2,210	2,294	2,546	2,798	4,993 2,358
Purchase of miners' rights and railway passes for unemployed miners	1,856	1,822	...	...	...
Ventilation of mines—Testing schemes for	833	332	...	...	...
Cyanide Patent—Cost of opposing amendment	...	3,806	...	...	...
Geological and underground surveys of mines	5,722	5,789	5,809	5,245	5,450
Miscellaneous	941	1,056	1,396	1,035	873
Total	64,889	67,953	59,502	53,961	45,975

The expenditure under the heading Mining Department prior to 1903-4 included also the Water Supply Department. In 1904, however, the departments were separated, and the figures for 1903-4 in the above statement refer solely to the cost of the Mines Department. The allowance to Mining Boards remains the same as in previous years. A very considerable reduction (£4,378) was made in 1902-3 in the allowance to the Railway Department for the carriage of Victorian coal and a further slight reduction has taken place in 1903-4. The money expended on diamond drills for prospecting and testing plants has been materially increased from £2,798 in 1902-3 to £7,351 in 1903-4.

The following information has been extracted from the census returns, and shows the manner of occupation of all persons connected with mining industries throughout the State:— Persons engaged in mining, 1901.

RETURN OF PERSONS ENGAGED IN MINING PURSUITS, 1901.

Persons following Mining Pursuits.	Employers of Labour.		In business on their own Account.		Receiving Salary or Wages.		Relative assisting.		Not at work for more than a week prior to Census.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Mines Department officer (not Geologist)	..	..	..	..	76	3	..	1	..	..
Mining engineer, inspector, surveyor, (not Government)	15	..	32	..	90	..	..	..	11	..
Mine, gold (quartz), proprietor, manager, worker	216	2	1,567	..	7,747	..	65	..	925	..
,, gold (alluvial), proprietor, manager, worker	87	..	4,141	..	4,285	..	107	..	448	..
,, gold (undefined), proprietor, manager, worker	35	1	682	..	1,142	..	20	..	213	..
,, (undefined), proprietor, manager, worker	79	1	1,165	..	4,264	..	30	..	624	..
,, tin (lode), worker	..	..	1	..	..	..	..	..	1	..
,, tin (alluvial), proprietor, manager, worker	..	..	9	..	9	..	..	..	1	..
,, silver, proprietor, manager, worker	..	..	..	..	2	..	..	..	3	..
,, coal, proprietor, manager, worker	10	..	8	..	844	..	..	..	32	..
,, copper, manager, worker	..	..	1	..	9	..	..	..	2	..
,, precious stones, manager, worker	1	..	3	..	..	..	..	..	1	..
,, expert, amalgamator, diamond drill worker	5	..	12	..	56	..	..	..	3	..
,, director, agent, legal manager, clerk, secretary	65	..	97	1	334	8	1	1	..	..
Quartz crusher	17	..	14	..	573	..	1	..	30	..
Pyrites worker, ore roaster	2	..	2	..	61	..	..	..	2	..
Cyanide worker, &c.	32	..	7	..	170	..	..	..	1	..
Smelter, gold	..	..	1	..	3	..	..	..	..	..
,, other	..	..	..	..	17	..	..	..	4	..
Quarry proprietor, manager, clerk	41	1	51	..	1	..	7	..	..	..
,, man, worker	..	..	..	..	734	..	..	..	62	..
Others	..	..	1	..	..	..	..	..	1	..
Total	605	5	7,794	1	20,417	11	231	2	2,364	..

Total Males	31,411
Total Females	19
GRAND TOTAL	31,430

Mineral produce.

The following table shows the quantity and value of the metals and minerals produced in Victoria up to the end of 1904:—

MINERAL PRODUCE.

Mineral.	Recorded prior to 1904.		Recorded during 1904.		Total Recorded to end of 1904.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	ozs.	£	ozs.	£	ozs.	£
Gold	66,736,336	266,810,711	821,017	3,252,045	67,557,353	270,062,756
Silver ..	27,184	7,446	..	..	27,184	7,446
	1,146,284* tons.	180,597*	39,908* tons.	4,990*	1,186,192* tons.	185,587*
Coal, black ..	2,237,258	1,239,026	121,741	70,208	2,358,999	1,309,234
,, brown ..	48,366	19,557	..	..	48,366	19,557
Lignite	12,923	3,086	..	..	12,923	3,086
Ore—copper ..	17,470	206,895	..	..	17,470	206,895
,, tin ..	15,021	718,163	71	5,190	15,092	723,353
,, antimony ..	22,927	177,224	20	160	22,947	177,384
,, silverlead ..	793	5,760	..	..	793	5,760
,, iron ..	5,434	12,540	..	..	5,434	12,540
Diamonds ..	..	108	..	..	..	108
Sapphires, &c. ..	..	630	..	..	..	630
Gypsum ..	6,915	5,024	3,620	1,905	10,535	6,929
Magnesite ..	6	12	..	..	6	12
Kaolin	1,983	7,504	..	..	1,983	7,504
Infusorial earth ..	1,560	7,110	..	..	1,560	7,110
Building stones, various ..	..	3,129,163	..	44,943	..	3,174,106†
Limestone ..	..	148,892	..	38,642	..	187,534‡
Salt (crude) ..	..	21,723	..	2,053	..	23,776‡
Total ..	..	272,701,171	..	3,420,136	..	276,121,307

* Extracted from gold at the Melbourne Mint.——† From 1866 only.——‡ Record from 1900.

GOLD AND SILVER PRODUCTION, COIN AND PAPER MONEY OF THE WORLD.

The information contained in the first three of the following tables has been extracted principally from the annual report, issued in November, 1903, by the Director of the United States Mint. Since 1872, the figures are those of the Bureau of the Mint, and have been compiled from information furnished by foreign Governments, and revised from the latest data.

The information contained in the fourth table has been taken from the report of the Director of the British Mint.

TABLE SHOWING THE WORLD'S PRODUCTION OF GOLD AND SILVER SINCE 1860.

Year.	Gold.		Silver.	
	Ounces—Fine.	Value.	Ounces—Fine.	Value—Commercial.
		£		£
1860 to 1869	61,314,500	264,059,200	387,311,600	105,151,400
1870 to 1879	52,764,400	227,236,800	628,717,300	161,850,700
1880 to 1889	51,405,100	221,383,000	921,103,100	200,523,200
1890 to 1899	95,081,700	409,481,900	1,568,876,900	238,928,600
1900	12,315,100	53,036,700	173,591,400	22,422,200
1901	12,698,100	54,686,000	173,011,300	21,626,200
1902	14,313,700	61,416,600	175,102,302	19,354,840
Total	299,892,600	1,291,300,200	4,018,713,902	769,857,140

TABLE SHOWING THE WORLD'S PRODUCTION OF GOLD AND SILVER FOR THE YEAR ENDED 31ST DECEMBER, 1902.

Country.	Gold.		Silver.	
	Ounces—Fine.	Value.	Ounces—Fine.	Value—Commercial.
		£		£
United States	3,870,000	16,666,700	55,506,000	6,128,100
Canada	1,003,400	4,321,100	4,303,800	475,200
Australasia	3,946,400	16,768,500	16,172,702	1,806,340
Russia	1,090,100	4,694,500	158,700	17,500
Germany	3,000	13,000	5,722,600	631,900
Spain	500	2,100	3,700,200	408,600
Bolivia	200	1,000	12,992,600	1,434,600
Chili	27,800	119,800	3,566,800	393,800
Peru	112,500	484,600	4,264,500	470,900
China	422,400	1,819,100	...	...
British India	463,800	1,997,500	...	...
Other Countries	3,373,600	14,528,700	68,720,400	7,587,900
Total	14,313,700	61,416,600	175,102,302	19,354,840

TABLE SHOWING THE APPROXIMATE STOCKS OF MONEY IN THE AGGREGATE IN THE PRINCIPAL COUNTRIES OF THE WORLD AT THE CLOSE OF 1902.

Country.	Value of—		
	Gold.	Silver.	Uncovered Paper.
	£	£	£
United States ...	260,000,000	140,271,000	95,021,000
Austria-Hungary ...	58,957,000	16,896,000	9,708,000
British Empire—			
Australasia ...	26,792,000	1,271,000	...
Canada	7,042,000	1,396,000	11,854,000
Cape Colony ...	7,813,000	208,000	...
Great Britain ...	114,187,000	24,333,000	24,562,000
India	13,167,000	107,458,000	6,750,000
France	197,437,000	87,458 000	32,959,000
Germany	159,063,000	43,229 000	38,354,000
Italy	22,438,000	7,854,000	35,687,000
Japan	13,042,000	6,333 000	12,771,000
Netherlands	4,438,000	11,792,000	4,333,000
Russia	155,458,000	21,792,000	...
China	...	156,250,000	...
Siam	208,000	40,208,000	542,000
Other Countries ...	81,333,000	96,625,000	338,604,000
Total	1,121,375,000	763,374,000	611,145,000

TABLE SHOWING THE WORLD'S COINAGE OF GOLD AND SILVER DURING THE YEAR 1902.

Country.	Gold.	Silver.
	£	£
United Kingdom	7,126,200	1,101,100
Australasia	11,411,300	...
India (*a*)	...	3,423,200
British Colonies and Dependencies (*b*)	...	6,452,400
Austria-Hungary	1,173,900	1,380,800
France	1,955,000	475,600
Germany	4,388,000	2,205,300
Japan	1,510,400	104,200
United States (*a*)	12,912,600	6,274,200
Other Countries	953,900	1,833,900
Total	41,431,300	23,250,700

(*a*) Financial Year, 1901–2.
(*b*) Inclusive of coins struck at Calcutta and Bombay (during the Financial Year, 1901–2) and at the "Mint," Birmingham.

Gold production-coinage, &c.

From 1860 to the end of 1902 the gold production of the world amounted to 299,892,600 ounces, and it has been valued at £1,291,300,200. In 1902, the production was 14,313,700 ounces, valued at £61,416,600—the maximum quantity, 3,946,400 ounces, valued at £16,768,500, being the produce of Australasian mines—the United States of America coming next with 3,870,000 ounces, valued at £16,666,700. Approximately, the world's stock of money in gold at the end of 1902 was valued at £1,121,375,000, of which £260,000,000 was in the United States, £114,187,000 in Great Britain, £26,792,000 in Australasia, £7,042,000 in Canada, £13,167,000 in India. Germany held £159,063,000; France, £197,437,000; Russia, £155,458,000; and Japan, £13,042,000. During the year 1902, the total issue of gold coins has been estimated at £41,431,300, of which the United States contributed £12,912,600; Australasia, £11,411,300; the United Kingdom, £7,126,200; Germany, £4,388,000; and France, £1,955,000.

Silver production, coinage, &c.

The world's production of silver, from 1860 to 1902, amounted to 4,018,713,902 fine ounces, its commercial value being £769,857,140. In 1902, the production was 175,102,302 fine ounces, worth £19,354,840. The United States occupies first place, with a produce of 55½ million ounces, valued at £6,128,100. The produce from Australasia was 16,172,702 ounces, valued at £1,806,340; and Bolivia comes next with 12,992,600 ounces, valued at £1,434,600.

The total stock of money in silver in the world at the end of 1902 was valued at £763,374,000. The largest stock was held in China, and was valued at £156,250,000. The United States possessed £140,271,000; India, £107,458,000; France, £87,458,000; Germany, £43,229,000; Siam, £40,208,000; Great Britain, £24,333,000; and Australasia, £1,271,000. During 1902 the issue of silver coins was valued at £23,250,700. In the

British colonies and dependencies, other than Australasia and India, £6,452,400 was the value of the coins issued; in the United States it was £6,274,200; in India, £3,423,200; in Germany, £2,205,300; in Austria-Hungary, £1,380,800; and in Great Britain, £1,101,100. Australasia issued no silver coins. The right to coin this metal has not yet been extended to these States.

Paper money.

The amount of uncovered paper in use throughout the various countries of the world is valued at £611,145,000. The United States holds £95,021,000; Germany, £38,354,000; Italy, £35,687,000; France, £32,959,000; Great Britain, £24,562,000; and Canada, £11,854,000. Australasia holds no paper money uncovered by coin of legal tender or bullion.

AUSTRALASIAN GOLD.

Gold raised in Australasia.

Since the first discovery, in 1851, of gold in Australasia, nearly 133¾ million ozs. have been raised in the various States, over one-half of which was got in Victoria. Prior to 1898, Victoria was almost invariably the leading gold-producing State of the group, but in 1904 its yield was about 60,400 ozs. less than in Queensland, and 1,552,000 ozs. less than in Western Australia, which has in recent years increased its production by leaps and bounds from 110,000 ozs. in 1893 to more than two and a third million ounces in 1904. The following is a statement of the quantity recorded as having been raised in the respective States at different periods:—

GOLD RAISED IN AUSTRALASIA, 1851 TO 1904.

Period.	Victoria.	New South Wales.	Queensland.	South Australia.	Western Australia.	Tasmania.	New Zealand.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
1851–55	10,281,303	1,920,200	..	..	..	..	..
1856–60	13,052,960	1,360,763	4,127	..	..	..	35,845
1861–65	8,694,194	2,233,001	52,580	..	..	..	2,288,088
1866–70	7,582,372	1,309,911	512,803	..	..	3,504	3,218,916
1871–75	6,036,776	1,613,049	1,319,952	24,685	..	25,296	2,412,446
1876–80	4,119,521	640,210	1,668,819	59,910	..	154,883	1,596,899
1881–85	3,992,077	626,931	1,327,366	88,366	..	235,973	1,237,456
1886–90	3,111,371	546,954	2,598,254	130,218	46,967	169,017	1,028,571
1891 ..	576,399	153,583	576,439	35,533	30,311	48,769	251,996
1892 ..	654,456	158,502	615,558	30,218	59,548	45,110	238,079
1893 ..	671,126	179,288	616,940	42,905	110,891	37,230	226,811
1894 ..	716,954	324,787	679,511	42,795	207,131	58,059	221,615
1895 ..	740,086	360,165	631,682	37,054	231,513	54,964	293,491
1896 ..	805,087	296,072	640,385	31,504	281,265	62,591	263,694
1897 ..	812,766	296,416	807,928	33,900	674,994	71,131	251,645
1898 ..	837,257	328,840	920,048	31,961	1,050,184	74,233	280,175
1899 ..	854,500	459,800	946,894	23,122	1,643,877	83,992	389,558
1900 ..	807,407	309,884	963,189	24,087	1,580,950	81,175	373,616
1901 ..	789,562	213,689	835,553	36,958	1,879,390	74,835	455,561
1902 ..	777,738	190,316	860,453	28,199	2,177,442	70,996	508,045
1903 ..	822,424	295,778	921,363	27,829	2,436,311	59,891	533,314
1904 ..	821,017	324,996	881,436	34,079	2,373,021	65,921	520,320

Gold produce of Australasia, 1851 to 1904.

According to the foregoing table, the total quantity of gold raised in each State, from 1851 to 1904, has been as follows:—

SUMMARY OF GOLD RAISED IN AUSTRALASIA, 1851 TO 1904.

	ozs.
Victoria	67,557,353
Queensland	18,381,280
New Zealand	16,626,141
Western Australia	14,783,795
New South Wales	14,143,135
Tasmania	1,477,570
South Australia	763,323
Total	133,732,597

VICTORIAN GOLD.

Yields, alluvial and quartz, Victoria.

In the following return will be found the yield of gold from alluvial workings, and from quartz reefs during 1904, in the more important mining districts of the State, as estimated by mining registrars:—

GOLD DERIVED FROM ALLUVIAL WORKINGS AND QUARTZ REEFS.

Mining District.	Alluvial.	Quartz.	Total.
	oz.	oz.	oz.
Ararat and Stawell ...	13,085	11,458	24,544
Ballarat	44,713	104,260	148,973
Beechworth	85,083	37,502	122,585
Bendigo	12,746	230,135	242,880
Castlemaine	26,860	50,310	77,170
Gippsland	6,820	59,901	66,721
Maryborough	41,786	43,363	85,149
Total	231,093	536,929	768,022

Import and export of bullion and specie.

The following table shows the import and export of bullion and specie during 1904:—

IMPORT AND EXPORT OF BULLION AND SPECIE, 1904.

—	Imports.	Exports.
GOLD—	£	£
Bullion ...	896,528	486,593
Coin ...	79,100	2,949,450
SILVER—		
Bullion ...	1,356	1,108
Coin ...	5,427	58
BRONZE—		
Coin ...	1,005	...
Total ...	983,416	3,437,209

Mining—deep shafts.

At Bendigo eleven mine shafts were over 3,000 feet in depth on 31st December, 1904, namely, the Victoria Quartz, 3,740 feet; the Lazarus New Chum, 3,777 feet; the New Chum Railway, 3,896 feet; the Shenandoah, 3,276 feet; the New Chum and Victoria, 3,175 feet; Lansell's 180, 3,354 feet; New Chum Consolidated, 3,099 feet; North Johnson's, 3,500 feet; Great Extended Hustlers, 3,081 feet; the Eureka Extended, 3,060 feet; and Princess Dagmar, 3,040 feet. There are winzes in the New Chum Railway and Victoria Quartz down 4,056 feet and 4,040 feet respectively.

Value of machinery on gold-fields.

The following is a return showing the value of machinery used in alluvial and quartz mining during the five years ended 1904:—

VALUE OF MACHINERY ON GOLD-FIELDS: RETURN FOR FIVE YEARS.

Year.	Approximate Value of Machinery Employed in—		
	Alluvial Mining.	Quartz Mining.	Total.
	£	£	£
1900	562,690	1,375,350	1,938,040
1901	534,420	1,446,140	1,980,560
1902	523,320	1,435,240	1,958,560
1903	566,445	1,474,245	2,040,690
1904	628,520	1,551,990	2,180,510

Dividends paid, 1900 to 1904.

The following return shows the amount paid in dividends in each mining district of the State for the last five years:—

DIVIDENDS PAID BY GOLD MINING COMPANIES IN EACH MINING DISTRICT: RETURN FOR FIVE YEARS.

Mining District.	Amount Distributed.				
	1900.	1901.	1902	1903.	1904.
	£	£	£	£	£
Ararat and Stawell ...	7,352	13,353	13,900	15,105	10,167
Ballarat	112,375	101,650	114,408	123,000	77,315
Beechworth ...	19,600	10,263	18,100	47,346	57,511
Bendigo	168,042	184,771	213,438	319,370	382,321
Castlemaine ...	74,900	42,250	28,050	15,700	17,240
Gippsland	41,814	25,360	46,840	34,700	41,844
Maryborough ...	29,250	50,350	37,400	44,780	37,000
Total	453,333	427,997	472,136	600,801	623,398

Yields and dividends for the whole State are shown below:—

YIELDS AND DIVIDENDS.

Year.	Value of Gold Produced.	Dividends Paid.
	£	£
1900	3,190,940	453,333
1901	3,102,753	427,997
1902	3,062,028	472,136
1903	3,259,483	600,801
1904	3,252,045	623,398

In 1900, the dividends paid amounted to 14 per cent. of the total yield, and in 1904 to 19 per cent.

Gold miners, 1900 to 1904.

The number of miners actually at work on the gold-fields is estimated annually by the Mining Department, and the figures for the five years ended with 1904 are subjoined:—

NUMBER OF MEN EMPLOYED IN GOLD MINING, 1900 TO 1904.

Year.	Alluvial Miners.	Quartz Miners.	Total.
1900	12,836	16,199	29,035
1901	12,886	14,891	27,777
1902	11,963	14,140	26,103
1903	11,158	14,694	25,852
1904	10,750	13,920	24,670

The total quantity of gold obtained from the Victorian mines in 1904 was 821,017 ozs. The total value of the gold produced during the year was £3,252,045. This value was based on the average value of the gold received at the Melbourne Mint, viz., £3 19s. 3d. per oz. During the eight months ended August, 1905, the yield amounted to 508,518 ozs., showing a decrease of 31,044 ozs., compared with the corresponding period of 1904.

Gold raised, 1871 to 1891.

From 1871 to 1891 the quantity of gold raised gradually diminished, with little intermission, from over 1,300,000 ozs., to only 576,000 ozs., but since then there has been a steady annual increase, until 854,500 ozs. was raised in 1899, which was the largest production since 1882. However, since 1899, the production has decreased each year to 777,388 ozs., in 1902; but substantial increases have taken place in 1903 and 1904, when the yields were 822,424 ozs. and 821,017 ozs. respectively.

AUSTRALASIAN SILVER.

Silver raised in Australasia.

We have no record of silver production in Victoria earlier than 1863, and the returns from all the other States are of later date. Since 12th June, 1872, the date of the opening of the Melbourne branch of the Royal Mint, nearly all the silver produced in Victoria

has been extracted from crude gold. Up to the end of 1904, only 27,184 ozs. have been obtained from silver mining. The total quantity extracted from gold is 1,186,192 ozs.

The Government Statist of New South Wales reports that up to the year 1882 the quantity of silver raised in that State was very small, but in that and the following years extensive discoveries of the metal, associated principally with lead and copper ore, were made in various parts of the State, notably at Boorook, in the New England district, and later on at Sunny Corner, near Bathurst, and at Silverton and Broken Hill, on the Barrier Ranges, in the western district. The latter is the most extensive and valuable silver mine field in the State, the aggregate output of silver-lead ore from the fields was valued at 32 million pounds at the end of 1903.

Silver has been found in Queensland during many years past, the total production to date being nearly 6½ million ounces. There are no silver mines in Western Australia, the quantity returned having been extracted from gold at the Mint. Tasmania is the only State, except New South Wales, where silver mining, to any great extent, has been carried out. The earliest recorded returns are in 1886, and up to date nearly 20 million ounces have been produced. The following return contains full particulars up to the end of 1903 of silver production in the various States of the Commonwealth, and in New Zealand:—

SILVER RAISED IN AUSTRALIAN STATES AND NEW ZEALAND, 1863 TO 1903.

Year or Period.	Victoria.	New South Wales.	Queensland.	Western Australia.	Tasmania.	New Zealand.
	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
1863 to 1865	10,165	...		...	...	...
1866 to 1870	8,187	14,621		...	...	48,186
1871 to 1875	56,106	318,432	2,771,733*	...	..	223,174
1876 to 1880	116,042	335,734		...	...	110,244
1881 to 1885	119,442	1,060,771		...	...	82,943
1886 to 1890	136,321	35,311,788		...	168,500	90,062
1891 to 1895	208,393	80,328,601	930,116†	...	5,369,770	252,353
1896 to 1900	350,351	77,633,471	875,685	...	9,072,458	1,247,775
1901 ...	54,362	14,835,704	571,561	356	1,657,824	571,134
1902 ...	47,683	12,801,591	701,312	2,462	1,945,458	674,196
1903 ...	40,533	13,342,101	642,125	399,190	1,711,040	911,914
Total ...	1,147,585	235,982,814	6,492,532	402,008	19,925,050	4,211,981

* Includes that raised in 1891.

† For the four years 1892 to 1895.

COAL PRODUCTION OF THE WORLD.

Exclusive of brown coal and lignite, the total known production of coal in the world, according to the latest available figures, is about 790 million tons (of 2,240 lbs.) per annum, of which the United Kingdom produces 230,334,000 tons; British India, 7,424,000 tons; Canada, 7,140,000 tons; Australia, 7,177,000 tons; New Zealand, 1,420,000 tons; Cape of Good Hope, 166,000 tons; Natal, 714,000 tons; Transvaal, 2,016,000 tons. The number of persons employed in connexion with the coal industry was, approximately, 3,664,500. The United Kingdom employed 1,482,400 hands; British India, 98,312; Canada, 14,753; Australia, 16,588; New Zealand, 4,967; Cape of Good Hope, 3,875; Natal, 6,940; Transvaal, 7,364.

The principal countries exporting coal are the United Kingdom, where the excess of exports over imports amounted to 60,397,000 tons; Germany, 12,111,000 tons; United States, 3,583,000 tons; New South Wales, 3,715,670 tons; Belgium, 3,078,000 tons; Japan, 2,866,000 tons; and Natal, British India, New Zealand, and the Transvaal, about 798,000 tons. The principal countries receiving coal are—Russia, 3,259,000 tons; Sweden, 2,911,000 tons; France, 12,624,000 tons; Spain, 2,299,000 tons; Italy, 5,373,000 tons; Austria-Hungary, 5,387,000 tons; Canada, 3,010,000 tons; States of Australia (other than New South Wales), 1,364,352 tons; Cape of Good Hope, 446,000 tons.

The trade of New South Wales in coal is principally to the other States of Australia and New Zealand, the Straits Settlements, Hong Kong, India, Java, Chili, United States, and the Phillipine and Hawaiian Islands.

The following return shows the production of coal in the five principal coal-producing countries of the world, and in Australia and New Zealand:—

COAL PRODUCED AND CONSUMED IN VARIOUS COUNTRIES.

Country.	Production.	Value per ton at Collieries.	Production per head of Population.	Consumption per head of Population.	Number of Men Employed under and over ground.
	tons.	s. d.	tons.	tons.	
United Kingdom ...	230,334,000	8 2¾	5·44	3·93	1,482,400
Germany	116,638,000	8 10¼	1·98	1·75	794,532
France	34,318,000	11 8¾	·88	1·19	277,060
Belgium	23,912,000	10 6¾	3·42	3·07	233,489
United States ...	320,983,000	5 8¼	3·99	3·93	518,197
New South Wales ...	6,354,846	7 4	4·48	1·86	14,117
Queensland	507,801	6 6	·99	1·01	1,329
Western Australia ...	140,884	12 3	·68	1·21	392
Tasmania	51,805	8 1	·29	·55	161
Victoria	121,741	11 6¼	·10	·71	640
New Zealand ...	1,420,229	10 9	1·73	1·74	4,967

NOTE.—Some of the figures are provisional. Those for Australia relate to the year 1903, except in Victoria and Western Australia, which are for the years 1904 and 1902 respectively. In Germany, France, and Belgium the quantities are given in metric tons of 2,204 lbs.

Australasian Coal.

At the present time, with the exception of South Australia, coal is raised in all the States in the Commonwealth, and in the colony of New Zealand. The following are the quantities returned as brought to the surface in each of those States and colony of New Zealand :—

Coal raised in Australasia.

Coal Produced in Australasia.

Year.	Tons of Coal raised in—					
	New South Wales.	Queensland.	Western Australia.	Tasmania.	Victoria.	New Zealand.
Prior to 1876	14,774,680	395,681	..	76,606	5,831	709,931
1876 ..	1,319,918	50,627	..	6,100	1,095	
1877 ..	1,444,271	60,918	..	9,470	2,420	
1878 ..	1,575,497	52,580	..	12,311	Nil	162,218
1879 ..	1,583,381	55,012	..	9,514	Nil	231,218
1880 ..	1,466,180	58,052	..	12,219	3	299,923
1881 ..	1,769,597	65,612	..	11,163	Nil	337,262
1882 ..	2,109,282	74,436	..	8,803	10	378,272
1883 ..	2,521,457	104,269	..	8,872	428	421,764
1884 ..	2,749,109	129,980	..	7,194	3,280	480,831
1885 ..	2,878,863	209,698	..	5,334	800	511,063
1886 ..	2,830,175	228,656	..	10,391	86	534,353
1887 ..	2,922,497	238,813	..	27,763	3,357	558,620
1888 ..	3,203,444	311,412	..	41,577	8,573	613,895
1889 ..	3,655,632	265,507	..	40,300	14,596	586,445
1890 ..	3,060,876	338,344	..	53,812	14,601	637,397
1891 ..	4,037,922	271,603	..	45,524	22,834	668,794
1892 ..	3,780,968	257,803	..	35,669	23,363	673,315
1893 ..	3,278,328	264,403	..	34,042	91,726	691,548
1894 ..	3,672,076	270,705	..	30,922	171,660	719,546
1895 ..	3,738,589	323,068	..	33,349	194,227	740,827
1896 ..	3,909,517	371,390	..	43,548	226,562	792,851
1897 ..	4,383,591	358,407	..	42,530	236,277	840,713
1898 ..	4,706,251	407,934	3,250	49,116	242,860	907,033
1899 ..	4,597,028	494,009	54,336	43,113	262,380	975,234
1900 ..	5,507,497	497,132	118,410	50,811	211,596	1,093,990
1901 ..	5,968,426	539,472	117,836	49,176	209,329	1,227,638
1902 ..	5,942,011	501,531	140,884	49,898	225,164	1,362,702
1903 ..	6,354,846	507,801	133,000	51,805	64,200	1,420,193
1904 ..	6,019,809	512,015	138,550	61,114	121,741	1,537,838

Victorian Coal.

Coal returns, Victoria.

The following return shows the total quantity of black coal raised in Victoria:—

Black Coal Raised to 31st December, 1904.

Year.	Tons.
Prior to 1876	5,831
From 1876 to 31st December, 1890 ...	49,249
1891	22,834
1892	23,363
1893	91,726
1894	171,660
1895	194,227
1896	226,562
1897	236,277
1898	242,860
1899	262,380
1900	211,596
1901	209,329
1902	225,164
1903	64,200
1904	121,741
Total ...	2,358,999

Brown coal raised to date, 48,366 tons.

Many attempts were made to develop the coal industry of the State prior to 1889, but a great impetus was given in that year by the constitution of a Royal Commission, which was appointed to inquire into and report upon the best means of developing the industry. Several true coal seams, situated in various localities, chiefly in Gippsland, have been discovered, and were brought under the notice of the Commission. In 1890, five diamond drills were employed, and seams were worked at Boolarra and Korumburra, and, in 1891, at Jumbunna. Coal mining at the two latter places was immediately begun, and has been actively carried on ever since. The principal companies concerned in the industry are the Outtrim-Howitt Company, the Jumbunna Company, and the Coal Creek Proprietary Company.

Output of coal companies, 1904.

The number of colleries working at the end of 1904 was five, using engines of 1,817 horse-power, employing 640 hands under and over ground, and owning plant, land, and buildings of £46,983 value. The particulars of the output of these companies for 1904 are as follow:—

Output of Coal Companies, 1904.

Company	Tons.
Black Coal—	
Outtrim-Howitt	57,327
Jumbunna	39,364
Coal Creek Proprietary ...	22,547
Silkstone	2,014
New Extended Co-operative	429
Strezlecki	60
Total ...	121,741

No dividends were paid during 1904.

There was an increase in the number of miners employed in coal mines in 1904, as compared with the preceding year. This will be seen by the following figures:— Coal miners, 1900 to 1904.

NUMBER OF COAL MINERS EMPLOYED: RETURN FOR FIVE YEARS.

Year.	Number of Miners at Work.
1900	807
1901	877
1902	1,303
1903	377
1904	589

From January, 1903, up to the end of the year, the coal miners of Korumburra, Outtrim, and Jumbunna were on strike. The small number employed in 1903 was owing to the difficulty of obtaining men in place of the strikers, and to the interruption of trade caused by the strike. The strike was responsible for the reduction in output from 225,164 tons in 1902 to 64,200 tons in 1903. The industry appears to be gradually recovering since the termination of the labour trouble, but the production of 121,741 tons in 1904 is only half the annual quantity raised in the seven years ended 1902.

The following statement shows the progress of the industry since 1900, also, for comparison, the quantity and value of coal imported in the five years:—

COAL PRODUCED AND IMPORTED: RETURN FOR FIVE YEARS.

Year.	Raised in State.		Imported.		
	Quantity.	Value.	Quantity.	Value.	
				Official.*	Actual.†
	tons.	£	tons.	£	£
1900	211,596	101,599	690,567	403,723	578,350
1901	209,329	147,191	710,918	446,058	595,394
1902	225,164	155,850	656,656	428,904	533,533
1903	64,200	40,818	796,407	450,781	623,852
1904	121,741	70,208	743,470	412,765	539,016

* Value according to Customs Return found by adding 10 per cent. to value in New South Wales as given by importers.

† Estimated value found by adding to cost at Newcastle the actual freight, insurance, primage, &c.

During recent years, Victoria has been singularly immune from serious mining disasters. In the last twenty years, the average number of men employed in gold mining was 27,167, and the average yearly number of accidents, 106; thirty-five persons per annum being killed, and eighty-one injured, or 1·27 and 2·96 respectively per thousand employed. In coal mining, during the sixteen years, 1889-1904, there were 25 persons killed and 78 injured. Minin accidents.

land, buildings, and improvements for the year 1904:—

Classification According to Industry, 1904.

Nature of Industry.	Number of Manufactories.	Number using Machinery Worked by—					Actual Horse-power of Engines used.	Average Number of Persons Employed.				Number of Months in Operation during Year.	Salaries and Wages paid during the Year, excluding Working Proprietors.	Approximate Value of—	
		Steam.	Gas.	Electric.	Oil.	Water, Wind, Horse.		Males.		Females.				Machinery and Plant in Use.	Lands, Buildings, and Improvements.*
								Working Proprietors.	Employés.	Working Proprietors.	Employés.				
													£	£	£
Class I.—Treating Raw Material, the Product of Pastoral Pursuits, or Vegetable Products, not otherwise Classed.															
1. *Animal Products.*															
Boiling down, tallow rendering ..	16	16	..	..	..	..	152	7	69	..	..	8.6	5,605	10,068	12,061
Bone milling	20	18	1	..	1	..	467	12	87	..	..	9.3	6,204	25,179	18,635
Catgut, sausage skins	4	..	..	..	..	..	..	4	84	..	..	10.8	5,405	191	2,399
Tanning, fellmongering, woolwashing ..	86	54	1	2	3	7	963	88	1,349	..	2	10.8	113,869	109,095	145,984
2. *Vegetable Products.*															
Bark milling	3	3	..	..	..	..	28	2	22	..	..	7.1	1,435	1,597	3,595
Chaff cutting, corn crushing	188	99	46	8	35	..	1,398	196	733	4	5	6.6	36,438	58,791	129,328
Class II.—Oils and Fats, Animal and Vegetable.															
Oil, grease, glue	4	3	..	..	..	..	15	1	38	..	1	12.0	2,606	4,450	7,530
Soap, candle	19	13	1	..	..	..	217	17	464	..	11	11.4	39,366	101,486	101,256

QUANTITY AND VALUE OF MINERALS PRODUCED IN THE TRANSVAAL COLONY, 1900 TO 1904.

——	1900.	1901.	1902.	1903.	1904.
Quantity, in fine ozs., of gold produced ..	348,761	258,307	1,718,921	2,972,897	3,773,517
Value ..	£1,479,328	£1,095,652	£7,291,090	£12,610,038	£16,006,001
Quantity, in fine ozs., of silver produced	No record	No record	122,573	350,070	416,262
Value ..	No record	No record	£13,025	£36,745	£45,319
Total quantity of coal expressed in tons of 2,000 lbs. produced from the collieries ..	506,074	797,144	1,590,333	2,253,677	2,409,033
Value at the pit's mouth ..	£197,127	£329,113	£637,640	£877,976	£883,891
Total quantity expressed in carats of the diamonds won	Nil	Nil	1,065	174,976	884,331
Value ..	Nil	Nil	£2,402	£239,752	£1,150,873
Total value of all minerals, precious stones, &c. ..	£1,676,455	£1,439,108	£8,067,273	£14,048,377	£18,405,328
Average number of persons employed in each class of mining :—					
Gold ..	(Not known, War period)	15,952	37,380	73,833	96,973
Silver ..	..	..	..	..	..
Coal ..	(Not known, War period)	3,946	5,439	8,576	9,291
Diamonds ..	(Not known, War period)	Nil	25	1,097	2,782
Other minerals	Nil	133	973	2,424	3,114

MANUFACTORIES.

Definition of a factory.

In order to secure uniformity throughout the States of Australia and New Zealand, in tabulating and promulgating statistics relating to manufactories, the Australian Statisticians have agreed to regard as factories all establishments employing, on the average, four hands or upwards, also those with less than four hands, where machinery is worked by power other than manual, making or repairing for the trade, or for export. Where two or more industries are carried on by one proprietor in one building, each industry is, when possible, treated as a separate establishment.

Classification of factories, 1904.

The following table shows the number of factories in each class of industry prepared on this basis, the power used, the number of persons employed, the salaries and wages paid to such persons (excluding working proprietors), and the value of the machinery, plant, land, buildings, and improvements for the year 1904 :—

Classification According to Industry, 1904.

Nature of Industry.	Number of Manufactories.	Number using Machinery Worked by—					Actual Horse-power of Engines used.	Average Number of Persons Employed.				Number of Months in Operation during Year.	Salaries and Wages paid during the Year, excluding Working Proprietors.	Approximate Value of—	
								Males.		Females.					
		Steam.	Gas.	Electric.	Oil.	Water, Wind, Horse.		Working Proprietors.	Employés.	Working Proprietors.	Employés.			Machinery and Plant in Use.	Lands, Buildings, and Improvements.*
													£	£	£
Class I.—Treating Raw Material, the Product of Pastoral Pursuits, or Vegetable Products, not otherwise Classed.															
1. *Animal Products.*															
Boiling down, tallow rendering ..	16	16	..	..	..	..	152	7	69	..	..	8.6	5,605	10,068	12,061
Bone milling	20	18	1	..	1	..	467	12	87	..	..	9.3	6,204	25,179	18,635
Catgut, sausage skins	4	..	..	..	..	..	..	4	84	..	..	10.8	5,405	191	2,399
Tanning, fellmongering, woolwashing ..	86	54	1	2	3	7	963	88	1,349	..	2	10.8	113,869	109,095	145,984
2. *Vegetable Products.*															
Bark milling	3	3	..	..	..	..	28	2	22	..	..	7.1	1,435	1,597	3,595
Chaff cutting, corn crushing	188	99	46	8	35	..	1,398	196	733	4	5	6.6	36,438	58,791	129,328
Class II.—Oils and Fats, Animal and Vegetable.															
Oil, grease, glue	4	3	..	..	..	..	15	1	38	..	1	12.0	2,606	4,450	7,530
Soap, candle	19	13	1	..	..	..	217	17	464	..	11	11.4	39,366	101,486	101,256

Class III.—Process relating to Stone, Clay, Glass, &c.															
Brick, pottery, earthenware	111	31	1	..	4	73	1,144	122	1,280	1	29	9.6	102,980	96,669	154,436
Cement, including cement pipes	4	2	..	..	1	..	243	1	152	..	1	10.0	10,638	26,871	7,900
Lime	10	3	..	..	3	3	36	10	87	..	1	9.9	6,713	4,180	8,415
Asbestos	1	1	2	..	..	..	64	12	652	2	1	3.2 / 7.5	35,833	23,815	28,685
Glass (including bottles)	10														
Glass bevelling	17	5	3	3	..	..	56	17	152	1	1	11.4	12,514	4,289	21,236
Marble, stone dressing	34	6	4	4	1	..	102	42	273	1	1	11.6	27,835	10,488	32,397
Filter, stone	2	1	1	..	..	..	4	8	59	..	..	12.0 / 12.0	5,361	1,265	5,700
Modelling in plaster, cement, &c.	4														
Class IV.—Working in Wood.															
Cooperage	12	3	2	..	..	..	17	18	66	..	..	11.2 / 11.9	6,387	1,965	13,997
Cork-cutting	2														
Dairy, domestic implements	4	3	..	3	..	..	53	4	95	..	..	11.2 / 12.0	9,004	4,846	6,762
Bellows	2														
Saw-milling, forest	128	124	..	..	..	4	1,836	161	1,537	..	..	7.6	103,071	89,760	14,267
Saw-milling—moulding, joinery, &c.	87	39	32	6	2	..	1,873	92	1,485	..	9	10.7	137,790	85,979	162,733
Mantelpiece	4	1	..	..	..	..	14	3	117	..	1	12.0	10,799	885	3,300
Woodcarving, turnery	29	8	17	2	2	..	101	37	120	..	2	11.3	7,504	5,728	18,628
Class V.—Metal Works, Machinery, &c.															
Agricultural implement	50	36	3	..	5	..	531	55	1,434	1	6	11.5	129,559	62,163	70,938
Engineering, boilermaking, iron foundry	232	116	83	12	11	1	2,408	284	4,371	2	19	11.7	391,421	439,500	333,699
Railway workshop	15	8	3	..	..	..	489	..	1,737	..	5	12.0	211,278	158,311	253,662
Cutlery, tool	13	1	8	2	1	..	60	12	56	..	..	11.7	3,807	7,127	10,320
Nail	6	4	2	..	..	..	185	7	154	1	3	11.5	10,033	32,999	7,700
Iron safe, door	4	1	..	..	..	..	8	4	28	..	..	11.7	2,165	970	5,150
Sheet iron, tin (including japanning)	53	4	15	2	..	1	103	46	828	..	3	12.0	52,534	38,983	74,911
Oven, range	11	..	5	2	..	..	35	11	166	..	..	11.4	12,764	3,755	20,804
Pattern	5	..	4	1	..	..	11	6	14	..	..	11.2	773	745	2,548

CLASSIFICATION ACCORDING TO INDUSTRY, 1904—*continued.*

Nature of Industry.	Number of Manufactories.	Number using Machinery Worked by—					Actual Horse-power of Engine used.	Average Number of Persons Employed.				Number of Months in Operation during Year.	Salaries and Wages paid during the Year, excluding Working Proprietors.	Approximate Value of—	
		Steam.	Gas.	Electric.	Oil.	Water, Wind, Horse.		Males.		Females.				Machinery and Plant in Use.	Lands, Buildings, and Improvements.*
								Working Proprietors.	Employés.	Working Proprietors.	Employés.				
													£	£	£
Class V.—Metal Works, Machinery, &c.—continued.															
Meter	2	4	1	..	..	..	63	4	110	1	1	10.0	6,462	7,810	6,970
Spring	3											11.3			
Brass, coppersmithing	41	2	24	6	2	..	141	53	442	..	9	11.1	33,890	22,383	52,532
Lead, shot, pewter, zinc, &c.	4	3	1	..	..	..	232	4	55	..	1	11.7	5,183	7,815	13,560
Wireworking	12	2	3	1	1	..	60	18	167	..	2	11.6	10,533	7,845	16,414
Metallurgical	8	3	..	3	..	..	39	10	30	..	..	9.0	2,033	5,083	7,821
Smelting	2	4	1	..	..	..	86	2	75	..	..	12.0	7,320	10,510	6,287
Pyrites	3											11.4			
Cyanide	104	29	..	..	22	17	261	115	675	..	..	8.9	48,029	44,197	7,665
VI.—Connected with Food and Drink, or Preparation thereof.															
1. *Animal Food.*															
Bacon-curing	25	23	2	..	..	..	243	27	254	..	7	12.0	24,071	27,822	31,371
Butter, cheese	213	208	2	1	..	1	1,761	69	1,308	2	21	11.5	112,746	301,423	220,988
Butterine	1														
Creameries†	(266)	(264)	..	..	(1)	(1)	1,193	..	..	..	..	..	..	..	..
Meat freezing	19	15	..	..	..	..	1,240	14	441	..	1	8.0	28,246	78,459	185,005
Meat preserving															

2. *Vegetable Food, including Products not Foods, but usually associated with the Manufacture of Foods.*																
Biscuit	4	4	..	..	..	..	116	6	606	..	219	11.5	51,361	39,750	47,100
Confectionery	19	10	4	2	..	..	117	21	485	..	489	10.8	57,409	30,353	49,102
Flour	67	66	1	..	..	..	3,415	41	683	..	9	10.3	74,771	235,508	199,779
Jam, pickle, sauce, vinegar	27	18	1	1	..	..	252	23	792	1	520	9.9	71,032	35,524	83,096
Oatmeal, maizena, arrowroot, starch	14	3	5	1	..	1	679	13	215	..	126	11.4	21,634	67,064	118,750
Macaroni	3	..	2	1	..	..	11	4	18	1	1	11.6	453	1,075	2,646
Sugar, treacle, refining	2	2	..	..	..	..	506	2	318	..	23	12.0	31,175	83,500	86,500
3. *Drinks and Stimulants.*															
Aerated water, cordial, &c.	138	74	43	3	10	5	351	116	851	11	8	10.4	62,407	82,761	136,773
Malt	19	3	12	..	2	1	103	13	144	..	..	10.4	13,856	15,920	105,725
Brewing	45	44	..	..	1	..	844	40	960	1	1	11.5	119,189	231,687	521,145
Distilling	5	4	..	..	..	..	23	2	22	..	..	6.7	1,059	6,870	12,495
Coffee, chicory, cocoa, chocolate, mustard, spice, &c.	11	6	5	..	..	..	427	9	168	..	98	10.7	15,646	24,294	61,086
Ice	13	12	..	..	1	..	274	8	70	..	..	8.2	5,208	24,319	24,354
Salt	4	2	..	..	..	..	50	3	51	..	..	6.6	3,310	4,675	27,313
4. *Narcotics.*															
Tobacco, cigars, snuff	9	2	1	2	..	..	113	13	601	..	710	11.4	82,386	63,765	106,013
Class VII.—Clothing, and Textile Fabrics, and Fibrous Material.															
1. *Textile.*															
Woollen mill	10	9	1	..	..	..	1,719	7	645	..	579	11.6	62,940	212,286	94,603
2. *Dress.*															
Clothing, tailoring	320	2	18	17	..	..	121	269	1,420 ‡52	22	5,113 ‡317	11.4	339,291	29,434	344,764
Corset	4	..	..	..	..	..	..	..	2	4	35	12.0	1,807	93	5,100

Classification According to Industry, 1904—*continued.*

Nature of Industry.	Number of Manufactories.	Number using Machinery Worked by—					Actual Horse-power of Engines used.	Average Number of Persons Employed.				Number of Months in Operation during Year.	Salaries and Wages paid during the Year, excluding Working Proprietors.	Approximate Value of—	
		Steam.	Gas.	Electric.	Oil.	Water, Wind, Horse.		Males.		Females.				Machinery and Plant in Use.	Lands, Buildings, and Improvements.*
								Working Proprietors.	Employés.	Working Proprietors.	Employés.				
													£	£	£
2. *Dress*—continued.															
Dressmaking, millinery	464	..	7	15	..	..	63	28	91 ‡1	405	7,147 ‡83	10.9	202,779	22,641	292,990
Underclothing, shirt	110	4	12	21	..	..	190	28	136 ‡4	75	2,878 ‡466	11.0	108,141	26,779	107,052
Hat, cap	29	7	4	7	..	..	193	21	425	5	714 ‡37	10.8	59,371	20,045	48,234
Hosiery	16	1	3	1	..	..	21	10	23 ‡1	6	309 ‡1	10.6	10,102	9,375	15,370
Oilskin, waterproof clothing	5	..	2	2	..	..	10	6	37	1	135 ‡1	11.2	6,759	1,940	17,700
Boot, shoe	131	4	53	12	1	..	508	170	3,662 ‡21	4	1,792 ‡6	11.0	332,749	94,334	147,008
Fur	6	..	1	..	..	..	1	7	13	6	38	9.4	2,266	255	3,700
Umbrella	8	..	2	3	..	..	7	3	65	1	147	11.6	9,514	1,020	15,180
Dyeing	2	2	..	..	..	..	14	2	47	..	100	12.0	6,688	4,300	8,600
Feather Dressing	1											11.8			
3. *Fibrous Materials and Textiles, n.e.i.*															
Rope, twine, mat, bag, and sack ..	10	4	2	..	..	..	527	17	321	..	195	10.3	23,433	43,478	45,300
Tent, sail, tarpaulin	10	..	2	2	..	..	6	10	41	..	15	11.8	3,895	653	10,189

Class VIII.—Books, Paper, Printing, Engraving, &c.																
Printing (including newspapers, paper-bag, lithographic, electrotyping, stereotyping)	252	9	164	39	9	2	1,391	295	3,910	7	638	11.9	451,100	500,992	543,315
Photo lithography	3	..	1	1	..	..	5	4	41	..	2	12.0	5,292	4,550	3,590
Account-book, stationery, including rubber stamp	22	1	6	3	1	..	200	19	556	..	664	11.6	62,486	66,269	112,598
Ink, printing ink	6	..	3	..	..	..	23	5	36	..	1	11.9	2,267	1,558	6,784
Paper, strawboard, millboard	3	3	..	..	..	..	575	2	147	..	23	9.4	12,970	65,000	40,000
Fancy box, &c.	15	2	4	5	..	..	51	9	131	2	346	11.7	16,656	9,516	28,254
Die-sinking, engraving, medals, &c. ..	10	..	5	3	1	..	29	13	95	..	2	11.7	8,247	6,790	17,906
Class XI.—Musical Instruments.															
Organ	2	..	1	1	..	..	9	3	29	..	..	12.0	2,109	1,225	3,340
Class X.—Arms and Explosives.															
Ammunition	1											11.9			
Blasting powder, dynamite, lithofracteur, &c.	1	2	..	..	..	..	72	..	72	..	175	12.0	11,863	37,105	21,700
Fireworks	1											12.0			
Fuse	2	1	..	..	1	..	25	2	14	..	20	12.0	2,402	7,242	5,100
Class XI.—Vehicles and Fittings, Saddlery, Harness, &c.															
Coach carriage, waggon	245	23	15	2	5	1	231	305	2,004	2	7	11.7	136,758	42,575	199,672
Carriage lamp	1											12.0			
Cycle	44	1	19	11	..	..	60	37	327	1	2	11.8	22,337	9,727	54,998
Perambulator	4	..	..	..	..	..	..	4	34	..	1	11.0	2,671	380	3,400
Saddle, harness	45	..	..	2	..	..	2	41	302	..	23	11.7	24,251	2,775	62,213
Saddle-tree, saddlers' ironmongery, &c. ..	3	2	..	..	..	..	11	9	22	..	1	10.9	1,701	950	3,050
Whip	1											12.0			

Classification According to Industry, 1904—*continued.*

Nature of Industry.	Number of Manufactories.	Number using Machinery Worked by—					Actual Horse-power of Engine used.	Average Number of Persons Employed.				Number of Months in Operation during Year.	Salaries and Wages paid during the Year, excluding Working Proprietors.	Approximate Value of—	
								Males.		Females.					
		Steam.	Gas.	Electric.	Oil.	Water, Wind, Horse.		Working Proprietors.	Employés.	Working Proprietors.	Employés.			Machinery and Plant in Use.	Lands, Buildings, and Improvements.*
													£	£	£
Class XII.—Shipbuilding, Fittings, &c.															
Ship, boat	3	1	..	..	..	..	3	5	15	..	..	12·0	1,429	100	1,770
Docks, slips	7	7	..	..	..	..	1,154	5	96	..	..	10·4	9,183	54,780	381,380
Class XIII.—Furniture, Bedding, &c.															
Upholstery, bedding, flock	30	4	4	..	..	..	159	18	279	1	118	11·5	30,107	14,740	49,413
Bedstead	1											12·0			
Curled hair	3	..	3	..	..	..	14	4	27	..	1	12·0	1,747	1,140	2,650
Cabinet, including billiard table	116	8	15	8	2	..	244	155	1,019	1	24	11·4	88,907	18,309	151,617
Picture frame	17	..	3	8	..	..	18	18	101	1	18	11·9	6,656	1,693	21,312
Venetian blind	7	3	1	1	..	..	19	10	45	..	..	11·2	2,093	1,575	7,530
Class XIV.—Drugs, Chemicals, and By-products.															
Blacking, blue, washing powder, &c.	10	4	3	1	1	..	71	13	147	..	87	12·0	13,326	8,451	27,000
Chemical	31	14	5	2	..	..	579	22	436	..	93	11·5	41,353	81,581	112,954
Essential oil	14	10	..	..	..	..	17	12	105	1	3	8·6	5,682	3,200	6,836
Paint, varnish, white-lead	5	4	1	..	..	..	62	2	48	..	1	10·0	3,956	5,450	15,525

Class XV.—Surgical and Scientific Appliances.																
Philosophical instrument	5	..	1	3	..	..	3	3	17	..	2	12·0	1,065	711	4,983
Surgical instrument	3	..	2	1	..	..	3	..	11	..	2	12·0	1,289	330	1,880
Class XVI.—Timepieces, Jewellery, and Platedware.																
Goldsmithing, jewelling, gold-beating, electroplating	51	1	14	13	1	1	89	56	539	..	34	11·8	51,905	15,049	78,694
Class XVII.—Heat, Light, and Energy.																
Electric apparatus	6	..	2	3	..	..	22	5	49	..	..	11·8	4,227	3,486	7,512
Electric light	7	7	..	..	..	..	5,226	1	221	..	..	12·0	22,422	374,850	110,894
Gas§, coke	48	7	2	..	..	..	568	2	870	..	..	12·0	104,383	1,246,058	484,973
Match	1											12·0			
Fire kindlers	1	2	..	..	..	..	60	2	25	..	101	11·8	3,636	1,862	3,157
Ironfounders' charcoal dust	1											12·0			
Hydraulic power	2	2	..	..	..	..	600	..	15	..	..	12·0	2,115	42,456	30,589
Class XVIII.—Leatherware (except Saddlery and Harness).																
Fancy leather	11	4	2	..	..	..	39	14	130	..	56	12·0	10,320	2,825	8,288
Leather belting	3	..	2	1	..	..	14	6	38	..	1	12·0	3,224	2,750	7,500
Portmanteau, trunk	6	..	..	1	..	..	2	6	53	1	10	11·7	3,645	820	6,345
Class XIX.—Wares, not elsewhere included.																
Basket, wicker	5	..	1	..	..	..	2	4	32	..	..	12·0	2,144	174	5,310
Bellows (see Class IV.).																
Brush, broom	16	..	5	4	..	..	19	15	148	..	46	11·7	13,467	4,312	16,544
Cork-cutting (see Class IV.).											‡1				
Rubber goods (including tires)	4	3	1	..	..	..	595	2	499	..	199	12·0	42,139	44,583	24,719
Total	4,208	1,304	734	261	130	118	40,859	3,612	46,863	576	24,245	..	4,794,365	6,027,134	7,641,051
									‡79	..	‡912				

NOTE.—Where the number of factories is braced the information has been combined in order to conceal the contents of individual schedules.

* The figures in this column refer to purchased land only. One hundred and eighty-three establishments (including seventeen creameries and fifty-three cyanide works) were carried on upon Crown lands; in these cases, no valuation of the land has been given.

† Creameries are not counted as separate establishments, but are regarded merely as branches of butter factories. The number of hands employed was 324 males.

‡ Factory workers, working at their own homes.

§ Including one Pintsch gas-works.

Hands employed, male and female.

Of the total hands employed (76,287), 50,554 were males and 25,733 females. Of these, 3,612 were male and 576 female, working proprietors; 2,213 male and 342 female, managers and overseers; 2,085 male and 273 female accountants and clerks; 1,470 engine-drivers (male); 37,567 male and 23,553 female workers in factories; 79 males and 912 females are described as factory workers, working in their own homes; 2,657 are carters and messengers (male); all others number 871 males and 77 females. The increase in the total on the previous year was 3,058—1,120 males and 1,938 females.

Classification according to hands employed.

The classification of factories according to the number of hands employed was:—

Under 4 hands	615 factories	1,772 hands
4 hands	499 ,,	1,996 ,,
5 to 10 hands	1,613 ,,	11,156 ,,
11 to 20 hands	745 ,,	10,816 ,,
21 to 50 hands	455 ,,	13,754 ,,
51 to 100 hands	163 ,,	11,073 ,,
101 and upwards	118 ,,	25,720 ,,
Total	4,208 ,,	76,287 ,,

Of those employed in factories with under 4 hands, 324 were employed in connexion with creameries. Of the 4,208 establishments, 2,548 used steam or other power, and employed 58,334 hands; and 1,660 used manual labour only, and employed 17,953 hands.

Factories, metropolitan and country.

In the following return will be found particulars for the years 1903 and 1904, of all factories in operation in the metropolitan and country districts. In the latter year the manufactories of the State were returned as 4,208 in number—an increase of 57 over the year 1903. Of these, 2,305 were established in the metropolitan, and 1,903 in the country districts—an increase of 12 in the metropolitan, and 45 in the country districts. The additional factories established in the metropolitan district were principally those connected with metal works, machinery, &c. (9); food and drink (4); clothing and textile fabrics (8); books, paper, &c. (10). In the country there were increases in factories working in wood (4), metal works, machinery, &c. (14); food and drink (13); clothing and textile fabrics (10); books, paper, &c. (4); vehicles, saddlery, harness, &c. (2). In certain other industries the number of factories has been slightly reduced.

Number of Factories and Hands Employed, 1903 and 1904.

Nature of Industry.	1903.			1904.		
	No. of Manufactories.	Average Number of Persons Employed.		No. of Manufactories.	Average Number of Persons Employed.	
		Males.	Females		Males.	Females
Metropolitan Area.						
1. Treating raw material, the product of pastoral pursuits, &c.	97	1,570	6	88	1,344	3
2. Oils and fats, animal and vegetable ..	12	439	8	11	438	12
3. Processes relating to stone, clay, glass, &c.	79	2,214	14	82	2,153	10
4. Working in wood	107	1,929	6	103	1,786	10
5. Metal works, machinery, &c. ..	304	7,365	37	313	7,651	40
6. Connected with food and drink, &c. ..	160	5,392	1,928	164	5,073	2,054
7. Clothing and textile fabrics, &c. ..	827	5,918	16,154	835	6,236	17,592
8. Books, paper, printing, engraving, &c.	193	4,019	1,406	203	4,167	1,594
9. Musical instruments	2	25	..	2	32	..
10. Arms and explosives	2	54	183	2	50	164
11. Vehicles, &c., saddlery, harness ..	164	1,557	30	171	1,606	31
12. Shipbuilding, fittings, &c.	6	87	..	8	108	..
13. Furniture, bedding, &c.	169	1,662	221	158	1,589	162
14. Drugs, chemicals, and by-products ..	45	645	214	44	632	181
15. Surgical and scientific appliances ..	9	30	5	8	31	4
16. Timepieces, jewellery, and plated ware	47	554	25	45	582	33
17. Heat, light, and energy	25	749	48	23	973	101
18. Leatherware, except saddlery and harness	20	221	59	20	247	68
19. Wares (not elsewhere included) ..	25	635	220	25	700	246
Total	2,293	35,065	20,654	2,305	35,398	22,305
Country Districts.						
1. Treating raw material, the product of pastoral pursuits, &c.	227	1,387	13	229	1,309	8
2. Oils and fats, animal and vegetable ..	12	81	..	12	82	..
3. Processes relating to stone, clay, glass, &c.	112	816	32	111	714	29
4. Working in wood	161	1,773	5	165	1,949	2
5. Metal works, machinery, &c. ..	241	2,936	12	255	3,322	14
6. Connected with food and drink, &c. ..	461	3,137	145	474	3,338	195
7. Clothing and textile fabrics, &c. ..	281	1,350	2,879	291	1,346	3,045
8. Books, paper, printing, engraving, &c.	104	1,013	87	108	1,096	91
9. Musical instruments	..	..	..	..	..	..
10. Arms and explosives	3	62	43	3	38	31
11. Vehicles, &c., saddlery, harness ..	170	1,378	8	172	1,479	6
12. Shipbuilding, fittings, &c	2	11	..	2	13	..
13. Furniture, bedding, &c.	18	91	4	16	87	2
14. Drugs, chemicals, and by-products ..	17	125	3	16	153	4
15. Surgical and scientific appliances ..	..	..	..	..	..	..
16. Timepieces, jewellery, and plated ware	5	15	..	6	13	1
17. Heat, light, and energy	43	191	..	43	217	..
18. Leatherware, except saddlery and harness	1	3	..	..	..	..
19. Wares (not elsewhere included) ..	..	..	..	..	..	..
Total	1,858	14,369	3,231	1,903	15,156	3,428

NUMBER OF FACTORIES AND HANDS EMPLOYED—*continued.*

Nature of Industry.	1903. No. of Manufactories.	1903. Average Number of Persons Employed. Males.	1903. Females	1904. No. of Manufactories.	1904. Average Number of Persons Employed. Males.	1904. Females
State.						
1. Treating raw material, the product of pastoral pursuits, &c.	324	2,957	19	317	2,653	11
2. Oils and fats, animal and vegetable ..	24	520	8	23	520	12
3. Processes relating to stone, clay, glass, &c.	191	3,030	46	193	2,867	39
4. Working in wood	268	3,702	11	268	3,735	12
5. Metal works, machinery, &c. ..	545	10,301	49	568	10,973	54
6. Connected with food and drink, &c. ..	621	8,529	2,073	638	8,411	2,249
7. Clothing and textile fabrics, &c. ..	1,108	7,268	19,033	1,126	7,582	20,637
8. Books, paper, printing, engraving, &c.	297	5,032	1,493	311	5,263	1,685
9. Musical instruments	2	25	..	2	32	..
10. Arms and explosives	5	116	226	5	88	195
11. Vehicles, &c., saddlery, harness ..	334	2,935	38	343	3,085	37
12. Shipbuilding, fittings, &c.	8	98	..	10	121	..
13. Furniture, bedding, &c.	187	1,753	225	174	1,676	164
14. Drugs, chemicals, and by-products ..	62	770	217	60	785	185
15. Surgical and scientific appliances ..	9	30	5	8	31	4
16. Timepieces, jewellery, and plated ware	52	569	25	51	595	34
17. Heat, light, and energy	68	940	48	66	1,190	101
18. Leatherware, except saddlery and harness	21	224	59	20	247	68
19. Wares (not elsewhere included) ..	25	635	220	25	700	246
Total	4,151	49,434	23,795	4,208	50,554	25,733

Return of factories and works for three years.

The following is a summary, showing the power used, of the manufactories and works, as returned for each of the years, 1902 to 1904:—

SUMMARY OF MANUFACTORIES AND WORKS: RETURN FOR THREE YEARS.

Year.	Number of Factories.	Power Employed. Steam.	Gas.	Electric, Oil, Water, Wind, or Horse.	Manual.	Actual Horse-Power of Engines Used.
1902	4,003	1,328	755	330	1,590	43,821
1903	4,151	1,316	724	437	1,674	42,750
1904	4,208	1,304	734	509	1,661	40,859

Year.	Hands Employed. Males.	Females.	Total.	Approximate Value of— Machinery and Plant.	Land.	Buildings and Improvements.
				£	£	£
1902	49,658	23,405	73,063	5,082,023	3,045,291	5,125,969
1903	49,434	23,795	73,229	5,010,896	2,855,174	5,112,771
1904	50,554	25,733	76,287	6,027,134	2,721,076	4,919,975

The total value of machinery, plant, land, buildings, and improvements for 1904 shows an increase of £689,344, when compared with the previous year, chiefly caused by the inclusion of the value of the machinery and plant used in the distribution of gas and electricity.

In 1904, the manufacturers were asked to furnish full particulars of the wages paid, the value of the fuel and materials used, and of the output, or work done, for each class of industry. The information collected appears in the following statement:—

Wages paid, value of fuel and materials used, and output or work done for each class of industry, for the year ended the 31st December, 1904:— Wages, fuel, material, &c.

Class of Industry.	Value of—			
	Wages paid, exclusive of amount drawn by Working Proprietor.	Fuel and Light used.	Materials used.	Articles produced or Work done.
	£	£	£	£
1. Treating raw materials, the product of pastoral pursuits	168,956	18,595	1,232,233	1,608,233
2. Oils and fats, animal and vegetable ..	41,972	10,543	240,710	348,776
3. Processes relating to stone, clay, glass, &c	201,874	54,298	103,007	488,201
4. Working in wood	274,555	6,756	366,577	780,178
5. Metal works, machinery, railway workshops, &c.	927,784	64,304	1,199,152	2,760,424
6. Foods, drinks, and narcotics ..	775,959	113,846	6,154,815	8,609,819
7. Clothing, textile fabrics, boots, &c. ..	1,169,735	31,608	2,281,561	4,086,038
8. Books, paper, printing, newspapers, engraving, &c.	561,127	24,910	511,800	1,619,188
9. Musical instruments				
10. Arms and explosives	14,265	1,000	48,367	88,541
11. Vehicles, &c., saddlery, harness ..	187,718	7,113	232,366	542,307
12. Shipbuilding, fittings, docks, &c. ..	10,612	704	5,460	26,667
13. Furniture, bedding, &c.	129,510	2,735	178,522	404,362
14. Drugs, chemicals, and by-products ..	64,317	6,271	319,356	557,759
15. Surgical and scientific appliances ..	2,354	75	720	5,263
16. Timepieces, jewellery, plated ware ..	51,905	1,530	90,882	188,556
17. Heat, light, and energy	136,783	25,822	162,274	645,007
18. Leatherware (except saddlery and harness)	17,189	564	69,580	102,780
19. Wares (not elsewhere included) ..	57,750	4,540	158,721	264,081
Total	4,794,365	375,214	13,356,103	23,126,180

The total amount of wages paid during the year was £4,794,365, which represents an average per head for all employés of £66 10s. This average is very much below the general rate of wages, as shown in the table which follows, and this is due, in many instances, to the fact that the hands were not continuously employed, and this sum simply represents the average wages received by the hands during the twelve months. Further, all the factories were not in operation during the whole of the year. One factory was open only for a period of from 3 to 4 months; 197 from 6 to 7 months; 141 from 7 to 8 months; 174 from 8 to 9 months; 177 from 9 to 10 months; 971 from 10 to 11 months; 2,307 from 11 to 12 months; and only 240 were working for the whole twelve months.

In the following return will be found a statement of the rates of wages obtaining in the various industries of the State during 1904 :—

Wages in Melbourne, 1904.

A.—Rates of Wages ruling for Adult Workers in classified manufacturing industries in Melbourne during 1904.

*** This Statement has been compiled from information collected direct from Employers.

Industries.	Occupations.	Wages.	
		Range.	General Rate.
Class I.—Treating Raw Material the product of pastoral pursuits or vegetable products not otherwise classed.			
Order 1.—Animal products.			
Boiling down	Foremen	7s. to 8s. per day	7s. 6d. day
Bone Mill	Tallowmen	7s. to 7s. 6d. ,,	7s. ,,
	Labourers	6s. to 7s. ,,	6s. 6d. ,,
	Carters	7s. to 8s. ,,	7s. ,,
Sausage casing	Sausage skin cleaners	..	40s. per week
Tanning, fellmongery, wool-washing, scouring	Curriers	40s. to 60s. per week	48s. ,,
	Tanners	34s. to 45s. ,,	40s. ,,
	Beamsmen	40s. to 50s. ,,	45s. ,,
	Shedsmen	34s. to 45s. ,,	36s. ,,
	Fellmongers	30s. to 45s. ,,	36s. ,,
	Woolscourers	36s. to 42s. ,,	36s. ,,
Order 2.—Vegetable products.			
Bark mill	Labourers	36s. to 42s. per week	36s. per week
Chaff-cutting	,,	36s. to 39s. ,,	36s. ,,
Class II.—Oils and Fats, Animal and Vegetable.			
Oil, grease, glue	Labourers	7s. to 7s. 6d. per day	7s. per day
Soap, candle		Not procurable	Not procurable
Class III.—Processes relating to Stone, Clay, Glass, &c.			
Asbestos	Machinists	36s. to 42s. per week	40s. per week
Asphalt	Asphalters and tarpavers	7s. to 9s. per day	8s. per day
Brick, pottery, earthenware	Clayhole men	..	10½d. per hour
	Setters—Brick	..	11¼ ,,
	Burners ,,	10½d. to 1s. per hour	..
	Drawers ,,	..	1s. 1d. ,,
	Pipe-burners	56s. to 62s. per week	..
	Pipe setters and pressers	..	45s. per week
	Tile moulders and pressers	42s. to 45s. per week	..
	Hollow-ware pressers	45s. to 50s. ,,	..
	Stone-ware throwers	45s. to 50s. ,,	..
	Mould makers	45s. to 50s. ,,	..
	Placers and others	40s. to 45s. ,,	..
Glass (including bottles)	Bottlemakers	50s. to 80s. ,,	70s. per week
	Lampware blowers	50s. to 55s. ,,	52s. ,,
	,, finishers	50s. to 60s. ,,	60s. ,,
Glass bevelling, &c.	Bevellers	42s. to 60s. ,,	45s. ,,
	Silverers	42s. to 48s. ,,	45s. ,,
	Cutters	42s. to 54s. ,,	45s. ,,
Lime, cement, cement pipes	Labourers	6s. to 7s. per day	..
Marble, stone-dressing	Building Carvers	..	1s. 10½ per hr.
	Carvers and letter cutters	..	1s. 4½d. ,,
	Granite cutters	..	1s. 3d. ,,
	Bluestone, marble cutters	..	1s. 2d. ,,
	Polishers	..	10½d., 11d. ,,
	Labourers	..	10d. ,,
Modelling	Modellers	12s. to 14s. per day	..
	Shophands	10s. to 11s. ,,	..
	Pressers	..	42s. per week
Stonefilter	Filtermakers	..	35s. ,,

WAGES IN MELBOURNE, 1904—*continued.*

Industries.	Occupations.	Wages.	
		Range.	General Rate.
Class IV.—Working in Wood.			
Cooperage	Coopers	56s. to 62s. per week	56s. per week
Dairy implement (churn, &c.)	Box and case makers	..	45s. ,,
	Carpenters ..	..	54s. ,,
Mantelpiece	Mantelpiece makers ..	52s. to 60s. per week	52s. ,,
	Polishers, enamellers	50s. to 55s. ,,	50s. ,,
Saw-milling, moulding, joinery, sash, door, box, &c.	Sawyers	45s. to 57s. ,,	48s. ,,
	Carpenters and joiners	48s. to 60s. ,,	54s. ,,
	Machinists	45s. to 64s. ,,	52s. ,,
	Woodturners ..	..	54s. ,,
	Boxmakers ..	..	45s. ,,
	Painters and glaziers	..	50s. ,,
	Polishers	..	50s. ,,
	Engine-drivers ..	45s. to 60s. per week	54s. ,,
	Draymen and labourers	39s. to 45s. ,,	42s. ,,
Wood-carving, turning ..	Carvers	48s. to 54s. ,,	48s. ,,
	Turners	48s. to 54s. ,,	48s. ,,
Class V.—Metal Works, Machinery, &c.			
Agricultural implement ..	Blacksmiths ..	54s. to 60s. per week	60s. per week
	Fitters and turners ..	54s. to 60s. ,,	54s. ,,
	Carpenters ..	48s. to 60s. ,,	54s. ,,
	Painters	42s. to 48s. ,,	42s. ,,
	Labourers	36s. to 42s. ,,	36s. ,,
Brass, copper smithing ..	Brass moulders, finishers	48s. to 60s. ,,	48s. ,,
	Brasspolishers ..	..	42s. ,,
	Coppersmiths ..	45s. to 60s. ,,	54s. ,,
Cutlery	Cutlers	60s. to 80s. ,,	60s. ,,
	Knifesmiths ..	50s. to 55s. ,,	50s. ,,
	Sawmakers ..	40s. to 60s. ,,	50s. ,,
	Saw and tool grinders	30s. to 55s. ,,	45s. ,,
Engineering, boilermaking, iron foundry	Blacksmiths ..	54s. to 72s. ,,	60s. ,,
	Strikers	39s. to 45s. ,,	42s. ,,
	Fitters and turners ..	54s. to 66s. ,,	60s. ,,
	Boilermakers and platers	60s. to 72s. ,,	60s. ,,
	Riveters	60s. to 72s. ,,	60s. ,,
	Moulders—Heavy ..	54s. to 72s. ,,	60s. ,,
	,, Light ..	48s. to 60s. ,,	48s. ,,
	Pipe moulders ..	45s. to 57s. ,,	..
	Planers and slotters ..	..	52s. ,,
	Drillers	38s. to 45s. ,,	42s. ,,
	Coremakers ..	48s. to 66s. ,,	60s. ,,
	Patternmakers ..	..	66s. ,,
	Iron Dressers ..	39s. to 42s. ,,	39s. ,,
	Carpenters ..	..	60s. ,,
	Labourers	38s. to 44s. ,,	40s. ,,
	Furnacemen, engine-drivers	45s. to 60s. ,,	45s. ,,
Bedstead, fender	Blacksmiths ..	42s. to 45s. ,,	48s. ,,
	Fitters	45s. to 54s. ,,	48s. ,,
	Chill fitters ..	48s. to 60s. ,,	54s. ,,
	Chippers	36s. to 42s. ,,	36s. ,,
	Modellers	56s. to 70s. ,,	60s. ,,
	Moulders	42s. to 60s. ,,	48s. ,,
	Grinders and polishers	42s. to 56s. ,,	50s. ,,
	Japanners	36s. to 60s. ,,	40s. ,,
	Electroplaters ..	56s. to 70s. ,,	56s. ,,
Iron safe, door	Fireproof, safe, &c., makers	..	48s. ,,
Lead, shot, pewter, zinc ..	Labourers in lead and shot factories ..	36s. to 42s. ,,	36s. ,,
	Zincworkers ..	48s. to 72s. ,,	60s. ,,
Meter	Instrument fitters ..	48s. to 60s. ,,	54s. ,,

WAGES IN MELBOURNE, 1904—*continued.*

Industries.	Occupations.	Wages.	
		Range.	General Rate.
Class V.—continued.			
Nail, barbed wire	Nail makers ..	40s. to 80s. per week	65s. per week
	Machine feeders (under 21)	20s. to 35s. ,,	30s. ,,
	Labourers	30s. to 35s. ,,	30s. ,,
	Barbed wire workers	32s. 6d. to 37s. 6d. per week	35s. ,,
Pattern making	Pattern makers ..	..	66s. ,,
Smelting, chlorination, cyanide, pyrites	Metallurgists and assayers	£4 to £5 per week ..	£4 ,,
	Cyaniders	36s. to 40s. per week	..
	Chlorinators ..	40s. to 55s. ,,	..
	Smelters	45s. to 70s. ,,	..
	Roasters	36s. to 42s. ,,	..
	Furnacemen ..	42s. to 60s. ,,	..
Spring	Spring fitters ..	45s. to 60s. ,,	48s. per week
	Springsmiths ..	..	48s. ,,
Stove, range, oven	Stove fitters ..	48s. to 60s. ,,	48s. ,,
	Oven fitters ..	..	42s. ,,
Tinsmithing, galvanized iron, sheet iron, japanning	Tinsmiths	30s. to 50s. ,,	40s. ,,
	Sheet iron workers ..	..	45s. ,,
	Galvanizers ..	42s. to 50s. ,,	42s. ,,
	Japanners	40s. to 60s. ,,	50s. ,,
Wire working	Wire workers ..	35s. to 48s. ,,	35s. ,,
Wire mattress	Weavers, framemakers	..	48s. ,,
	Varnishers	..	45s. ,,
Class VI.—Connected with Food and Drink, or the preparation thereof.			
Order 1.—Animal Food.			
Bacon-curing	Slaughtermen, cutters up, &c.	40s. to 55s. per week	48s. per week
Butter, cheese, concentrated milk	Factory managers ..	50s. to 90s. ,,	70s. ,,
	Butter makers, and churners	36s. to 45s. ,,	40s. ,,
	Cheese makers ..	45s. to 70s. ,,	50s. ,,
	Labourers, packers ..	30s. to 36s. ,,	30s. ,,
Butterine, margarine ..	Labourers ..	30s. to 42s. ,,	36s. ,,
Condensed milk	Condensers ..	50s. to 80s. ,,	60s. ,,
Meat, fish preserving, freezing	Slaughtermen ..	..	20s. per 100 sheep
	Kitchen hands, tallowmen	30s. to 42s. ,,	36s. per week
	Boners	42s. to 48s. ,,	..
	Preservers	36s. to 65s. ,,	50s. per week
	Tinsmiths	50s. to 70s. ,, (piece-work)	..
	Labourers, packers ..	30s. to 48s. ,,	36s. per week
	Chambermen, &c. ..	42s. to 48s. ,,	..
Order 2.—Vegetable Food, including products not foods but usually associated with the manufacture of foods.			
Biscuits	Factory foremen ..	38s. to 80s. per week	50s. per week
	Forewomen ..	20s. to 32s. 6d. ,,	20s. ,,
	Biscuit makers ..	35s. to 37s. 6d. ,,	35s. ,,
	Cake makers ..	40s. to 54s. ,,	40s. ,,
	Machine hands ..	30s. to 40s. ,,	35s. ,,
	Packers—male ..	32s. to 37s. 6d. ,,	32s. ,,
	,, female ..	..	14s. ,,
Confectionery	Confectioners ..	50s. to 100s. ,,	50s. ,,
	Storemen	45s. to 60s. ,,	45s. ,,
	Labourers ..	40s. to 50s. ,,	40s. ,,
	Chocolate dippers—female	17s. to 27s. 6d. ,,	20s. ,,

WAGES IN MELBOURNE, 1904—*continued.*

Industries.	Occupations.	Wages.	
		Range.	General Rate.
Class VI.—Order 2—continued.			
Flour mill	Foremen	..	60s. per week
	Smuttermen ..	40s. to 44s. per week	40s. ,,
	Wheat shooters ..	..	40s. ,,
	Flour and bran packers	30s. to 38s. per week	36s. ,,
	Engine-drivers, firemen	50s. to 70s. ,,	60s. ,,
Jam, fruit-preserving, pickle, sauce, vinegar	Foremen	35s. to 60s. ,,	50s. ,,
	Tinsmiths	56s. to 60s. ,, (piece work)	55s. ,, (piece-work)
	Coopers	56s. to 60s. per week	56s. per week
	Engine-drivers ..	48s. to 54s. ,,	50s. ,,
	General hands—male	30s. to 35s. ,,	30s. ,,
	,, ,, female	14s. to 21s. ,,	14s. ,,
Oatmeal, cornflour, starch, arrowroot, macaroni ..	.. .. ..	Not procurable ..	Not procurable
Sugar, treacle refining ..	Vacuum hands and others	33s. to 115s. per week	..
Order 3.—*Drinks and Stimulants.*			
Aerated waters, cordials ..	Cordial makers ..	..	60s. per week
	Bottlers ..	38s. to 40s. per week	40s. ,,
	Wirers	..	33s. ,,
	Washers	30s. to 33s. per week	30s. ,,
Brewing	Brewers	£10 to £12 ,,	..
	Topmen	44s. to 50s. ,,	44s. per week
	Cellarmen	44s. to 60s. ,,	44s. ,,
	Cask washers ..	44s. to 48s. ,,	44s. ,,
	Storemen	44s. to 50s. ,,	44s. ,,
	Coopers	56s. to 62s. ,,	56s. ,,
	Farriers	44s. to 72s. ,,	44s. ,,
	Carters, stablemen ..	44s. to 47s. 6d. ,,	47s. 6d. ,,
	Rackers, corkers, &c.	Not procurable ..	35s. ,, Not procurable
Condiments, coffee, chicory, cocoa, chocolate, spice, &c.			
Ice, refrigerating	Storemen	40s. to 60s. per week	40s. per week
	Chambermen ..	40s. to 45s. ,,	40s. ,,
	Ice pullers	36s. to 42s. ,,	39s. ,,
	Engine-drivers, firemen	42s. to 60s. ,,	48s. ,,
	Carters	42s. to 52s. ,,	45s. ,,
Malt	Maltsters	45s. to 70s. ,,	45s. ,,
Order 4.—*Narcotics.*			
Tobacco, cigar, cigarette ..	Tobacco (plug) makers	30s. to 80s. per week	50s. per week
	,, ,, wrappers —female	20s. to 30s. ,,	25s. ,,
	Cigar makers ..	35s. to 60s. ,,	45s. ,,
	Cigarette makers (machine)—female	17s. 6d. to 22s. 6d. per week	20s. ,,
	Cigarette makers (hand)—female	20s. to 40s. per week	25s. ,,
Class VII.—Clothing and Textile Fabrics and Fibrous Materials.			
Order 1.—*Textile.*			
Woollen cloth, blanket, rug ..	Foremen	50s. to 60s. per week	60s. per week
	Pattern weavers, tuners	..	40s. ,,
	Power-loom weavers ..	..	22s. 6d. ,,
	Fettlers, yarnmen, spinners	..	36s. ,,
	Wool scourers ..	30s. to 40s. per week	35s. ,,

WAGES IN MELBOURNE, 1904—*continued.*

Industries.	Occupations.	Wages.	
		Range.	General Rate.
Class VII.—Order 1—continued.			
Woollen cloth, blanket, rug ..	Dye house labourers ..	30s. to 40s. per week	36s. per week
	Wool dryers, warpers	..	30s. ,,
	Willey house labourers	..	36s. ,,
	Warpers—female ..	..	25s. ,,
	Mule minders ..	20s. to 30s. per week	30s. ,,
Order 2.—*Dress.*			
Boot, shoe	Makers, finishers, clickers, stuff-cutters, &c.	45s. to 60s. per week	45s. per week
	Machine operators ..	50s. to 60s. ,,	50s. ,,
	Assistant stuff-cutters, lining cutters, and all others	40s. to 50s. ,,	40s. ,,
	Machinists—female ..	20s. to 30s. ,,	20s. ,,
Clothing, tailoring	Cutters—order ..	60s. to 140s. ,,	80s. ,,
	,, stock ..	50s. to 80s. ,,	60s ,,
	Tailors	45s. to 60s. ,,	45s. ,,
	Tailoresses ..	20s. to 35s. ,,	20s. ,,
	Pressers	45s. to 55s. ,,	50s. ,,
	,, —female ..	..	30s. ,,
	Machinists—female ..	20s. to 30s. ,,	25s. ,,
Corset	Corset makers—female	17s. 6d. to 25s. ,,	17s. 6d. ,,
Dressmaking, millinery ..	Dressmakers—female	40s. to 120s. ,,	60s. ,,
	Dressmakers' assistants —female	15s. to 35s. ,,	18s. ,,
	Mantlemakers—female	40s. to 80s. ,,	40s ,,
	Mantlemakers' assistants—female	15s. to 35s. ,,	18s. ,,
	Milliners—female ..	40s. to 80s. ,,	40s. ,,
	Milliners' assistants—female	15s. to 35s. ,,	18s. ,,
	Pressers—female ..	16s. to 30s. ,,	20s. ,,
	Machinists—female ..	16s. to 25s. ,,	20s. ,,
	Laundry ironers, &c. —female	15s. to 20s. ,,	16s. 6d. ,,
Dye works	Dyers	50s. to 100s. ,,	50s. ,,
	Pressers	45s. to 50s. ,,	45s. ,,
	Pressers—female ..	16s. to 30s. ,,	20s. ,,
	Cleaners	40s. to 50s. ,,	40s. ,,
Furrier	Cutters	40s. to 80s. ,,	50s. ,,
	Machinists, &c.—female	16s. to 25s. ,,	18s. ,,
Hat, cap	Body makers, silk hats	50s. to 70s. ,,	60s.
	Finishers ,,	60s. to 80s. ,,	70s. } per week at piece-work rates
	Shapers ,,	80s. to 100s. ,,	80s. }
	Crown sewers, silk hats —female	25s. to 30s. ,,	25s. }
	Trimmers, silk hats—female	25s. to 30s. ,,	25s. }
	Bodymakers, felt hats	..	65s. per week
	Blockers ,,	60s. to 65s. ,,	65s. ,,
	Finishers ,,	60s. to 65s. ,,	65s. ,,
	Shapers ,,	..	65s. ,,
	Binders, felt hats—female	15s. to 30s. ,,	20s. ,,
	Trimmers, felt hats—female	15s. to 30s. ,,	20s. ,,
	Machinists, straw hats —female	16s. to 30s. ,,	25s. ,,
	Trimmers, straw hats—female	16s. to 20s. ,,	16s. ,,
	Blockers, pressers, women's hats	..	40s. ,,
	Machinists, women's hats—female	25s. to 35s. ,,	25s. ,,
	Machinists, caps—female	15s. to 25s. ,,	18s. ,,

WAGES IN MELBOURNE, 1904—*continued.*

Industries.	Occupations.	Wages.	
		Range.	General Rate.
Class VII.—Order 2—continued.			
Hosiery	Machinists, knitting—female	12s. to 25s. per week	20s. per week
	Machinists, sewing—female	15s. to 25s. ,,	20s. ,,
	Linkers—female ..	18s. to 24s. ,,	21s. ,,
	Pressers	48s. to 52s. ,,	50s. ,,
	Winders, menders, &c.—female	12s. to 18s. ,,	16s. ,,
Oilskin, waterproof clothing	Oilskin workers ..	45s. to 65s. ,,	45s. ,,
	Machinists, female ..	20s. to 30s. ,,	25s. ,,
	Waterproof cutters ..	50s. to 60s. ,,	50s. ,,
	Machinists, &c.—female	20s. to 30s. ,,	25s. ,,
Ostrich feather	Feather dyers ..	50s. to 63s. ,,	50s. ,,
	,, ,, female	..	35s. ,,
	,, curlers ..	15s. to 35s. ,,	25s. ,,
Shirtmaking, underclothing ..	Shirt makers, ,,	16s. to 30s. ,,	16s. ,,
	Underclothing makers—female	16s. to 25s. ,,	16s. ,,
Umbrella, parasol	Frame makers ..	40s. to 50s. ,,	40s. ,,
	Cutters	40s. to 55s. ,,	40s. ,,
	Machinists—female ..	15s. to 25s. ,,	20s. ,,
	Tippers ,, ..	15s. to 20s. ,,	16s. ,,
Order 3.—*Fibrous Materials and Textiles not elsewhere included.*			
Bag, sack (including calico bag)	.. .. ..	Not procurable ..	Not procurable
Flax milling	.. .. ..	,, ..	,,
Mat, matting	.. .. ..	,, ..	,,
Rope, twine	Undefined	30s. to 60s. per week	36s. per week
Tarpaulin, tent, sail ..	Tarpaulin, tent, sail makers	..	48s. ,,
Class VIII.—Books, Paper, Printing, Engraving.			
Die sinking, engraving ..	Die sinkers ..	52s. to 60s. per week	55s. per week
	Engravers, general ..	50s. to 80s. ,,	55s. ,,
	Process engravers ..	50s. to 90s. ,,	55s. ,,
Ink, printing ink	Ink makers ..	50s. to 70s. ,,	60s. ,,
Paper bag, box, &c. ..	Box cutters ..	35s. to 52s. ,,	40s. ,,
	Makers-up—female	15s. to 20s. ,,	17s. 6d. ,,
Paper, millboard, strawboard	Paper, &c., makers ..	..	60s. ,,
	Beatermen	..	60s. ,,
	Breakermen ..	..	42s. ,,
	General hands ..	36s. to 42s. per week	36s. ,,
	Engine drivers ..	..	54s. ,,
Printing (including lithographic printing, electrotyping, stereotyping)	Printers—Compositors	52s. to 80s. ,,	52s. ,,
	,, machinists	52s. to 60s. ,,	52s. ,,
	,, linotype-operators	70s. to 80s. ,,	80s. ,,
	Lithographers ..	52s. to 60s. ,,	52s. ,,
	Stereotypers—casters	..	40s. ,,
	,, moulders	..	60s. ,,
	,, finishers	..	55s. ,,
Bookbinding, account book making, stationery, &c.	Bookbinders ..	52s. to 80s. per week	52s. ,,
	Pagers—female ..	16s. to 17s. 6d. ,,	16s. ,,
	Sewers and folders—female	20s. to 30s. ,,	20s. ,,
	Paper rulers ..	52s. to 70s. ,,	52s. ,,
Class IX.— Musical Instruments.			
Organ, pianoforte	Organ builders, expert	..	84s. per week
	,, ,, ordinary	60s. to 72s. per week	60s. ,,
	Tuners and voicers ..	..	78s. ,,
	Case makers ..	..	60s. ,,
	Nickel pipe makers ..	..	60s. ,,

WAGES IN MELBOURNE, 1904—*continued.*

Industries.	Occupations.	Wages. Range.	Wages. General Rate.
Class X.—Arms and Explosives:			
Ammunition	Cartridge operators—female	12s. to 20s. per week	16s. per week
	Mechanics (fitters, &c.)	55s. to 66s. ,,	..
	Labourers	36s. to 42s. ,,	..
Explosive	Nitro-glycerine workers	42s. to 55s. ,,	48s. per week
	Acid workers	..	45s. ,,
	Labourers and carters	36s. to 42s. ,,	36s. ,,
Firework, Fuse	Fireworks makers	33s. to 45s. ,,	..
Class XI.—Vehicles, Fittings, Saddlery, Harness, &c.			
Carriage lamp	Lamp makers	40s. to 60s. per week	50s. per week
Coach, waggon, tramcar, spoke and felloe, wheelwright	Body makers	40s. to 60s. ,,	45s. ,,
	Wheelers	40s. to 50s. ,,	45s. ,,
	Smiths	40s. to 60s. ,,	48s. ,,
	Trimmers	40s. to 60s. ,,	45s. ,,
	Painters	40s. to 54s. ,,	48s. ,,
	Vicemen	35s. to 45s. ,,	40s. ,,
Cycle	Cycle builders	35s. to 48s. ,,	40s. ,,
	Motor builders	..	50s. ,,
	Turners	42s. to 60s. ,,	..
	Filers	40s. to 48s. ,,	40s. ,,
	Platers	45s. to 50s. ,,	45s. ,,
	Polishers	..	42s. ,,
	Smiths	..	48s. ,,
Perambulator	Wickerworkers	..	48s. ,,
	Fitters up	30s. to 50s. per week	30s. ,,
Saddlery, harness	Saddle makers	48s. to 55s. ,,	48s. ,,
	Collar makers	48s. to 55s. ,,	48s. ,,
	Harness makers	48s. to 55s. ,,	48s. ,,
Saddle-tree, saddlers' ironmongery, &c.	Saddle-tree makers	35s. to 50s. ,,	40s. ,,
Whip	Thong makers	40s. to 50s. ,,	40s. ,,
Horse shoeing, &c	Farriers	35s. to 45s. ,,	40s. ,,
Class XII.—Ship Building, Fittings, &c.			
Dock, ship	Shipwrights	..	12s. per day
	Foundry and shipsmiths	..	11s. ,,
	Labourers and painters	..	8s. ,,
	Stevedores-men and lumpers	..	1s. 3d. per hr.
	Wharf labourers	..	1s. ,,
Boat building	Boat builders	48s. to 60s. per week	48s. per week
Class XIII.—Furniture, Bedding, &c.			
Bedding, flock, upholstery	Bedding and mattress makers	46s. to 50s. per week	46s. per week
	Machinists—female	20s. to 22s. 6d. ,,	20s. ,,
	Machine feeders	..	25s. ,,
	Sorters, &c.—female	..	15s. ,,
	Upholsterers	48s. to 70s. per week	48s. ,,
Curled hair	Curled hair, horsehair workers	35s. to 50s. ,,	40s. ,,
Furniture, cabinet making, chair, billiard table	Cabinet makers	48s. to 70s. ,,	48s. ,,
	Carvers	48s. to 54s. ,,	48s. ,,
	Turners	48s. to 54s. ,,	48s. ,,
	Polishers	48s. to 54s. ,,	48s. ,,
	Billiard table makers	54s. to 60s. ,,	54s. ,,
	Cushion makers, machinists	..	60s. ,,
	Slate rubbers	..	42s. ,,

WAGES IN MELBOURNE, 1904—*continued.*

Industries.	Occupations.	Wages.	
		Range.	General Rate.
Class XIII.—continued.			
Picture frame	Frame makers ..	50s. to 55s. per week	50s. per week
	Mount cutters ..	35s. to 50s. ,,	40s. ,,
	Fitters-up—female ..	20s. to 27s. 6d. ,,	20s. ,,
Venetian blind, window blind	Venetian blind makers	36s. to 48s. ,,	36s. ,,
Class XIV.—Drugs, Chemicals, By-products.			
Baking powder	.. .. ..	Not procurable ..	Not procurable
Blacking, blue, washing powder, soda	Skilled, undefined ..	40s. to 100s. per week	..
	Unskilled ,, ..	25s. to 37s. 6d. ,,	..
	Wrappers—female ..	12s. 6d. to 20s. ,,	..
Chemical, drug, horse and cattle medicine	Makers of pharmaceutical preparations	50s. to 75s. per week	60s. per week
	Others working in drugs, &c.	35s. to 45s. ,,	40s. ,,
	Disinfectant makers	35s. to 45s. ,,	40s. ,,
Essential oil	Essence blending ..	35s. to 55s. ,,	40s. ,,
Fertilizer	Chemical manure workers	36s. to 40s. ,,	36s. ,,
Paint, varnish, white-lead ..	Paint makers ..	..	55s. ,,
Class XV.—Surgical and Scientific Appliances.			
Optical, philosophical, instrument, &c.	Opticians, &c. ..	35s. to 60s. per week	45s. per week
Surgical appliance, instrument	Surgical instrument makers	40s. to 80s. ,,	50s. ,,
Class XVI.—Timepiece, Jewellery, Platedware.			
Electroplating	Electroplaters and silversmiths	40s. to 80s. per week	65s. per week
	Metal polishers ..	35s. to 48s. ,,	35s. ,,
	Lacquerers—female ..	15s. to 30s. ,,	20s. ,,
Goldsmithing, jewellery, gold-beating	Goldsmiths, jewellers	50s. to 90s. ,,	55s. ,,
	Setters	80s. to 150s. ,,	100s. ,,
Watchmaking, &c.	Watchmakers	45s. to 70s. ,,	55s. ,,
Class XVII.—Heat, Light, and Energy.			
Electric apparatus	Engine-drivers ..	..	60s. per week
	Dynamo attendants	..	54s. ,,
	Winders	48s. to 60s. per week	54s. ,,
Electric light	Engine-drivers ..	..	10s. 6d. per day
	Firemen	8s. 6d. to 10s. per day	8s. 6d. per day
	Electrical fitters ..	9s. to 10s. ,,	9s. ,,
	Switchboard attendants	,, ,,	9s. ,,
	Linemen	7s. to 8s. ,,	7s. ,,
	Carboners	..	7s. ,,
	Patrolmen	..	7s. ,,
	Wirers	8s. to 9s. per day	8s. ,,
	Greasers	..	7s. ,,
Gas and coke	Stokers	..	7s. 9d. ,,
	Engineemen ..	..	7s. 10d. ,,
	Purifiers	6s. 4d. to 7s. 9d. per day	..
	Sulphate workers ..	..	7s. 10d. ,,

WAGES IN MELBOURNE, 1904—*continued.*

Industries.	Occupations.	Wages.	
		Range.	General Rate.
Class XVII.—continued.			
Gas and coke	Stove repairers and fitters	8s. to 10s. per day	..
	Service layers ..	7s. 10d. to 8s. 2d. per day	..
	Main layers ..	8s. 6d. to 9s. 6d. per day	..
	Inspectors	8s. 9d. to 11s. 6d. per day	..
	Labourers	6s. 6d. to 6s. 10d. per day	..
Hydraulic power	Enginemen ..	..	8s. per day
	Firemen	..	7s. 6d. ,,
	Fitters	..	9s. ,,
	Main layers ..	..	9s. ,,
	Special labourers ..	..	8s. ,,
	Ordinary labourers ..	..	7s. ,,
Ironfounders' dust, charcoal dust	Labourers ..	39s. to 45s. per week	39s. per week
Match	Vesta makers—female	12s. 6d. to 24s. ,,	16s. ,,
	Box makers—female	12s. to 21s. ,,	14s. ,,
Class XVIII. — Leatherware (excluding Saddlery and Harness.)			
Leather Belting	Belt makers ..	48s. to 60s. per week	48s. per week
	Machinists, putters-up,	..	48s. ,,
Portmanteau, gladstone bag	Leather bag makers	45s. to 60s. ,,	45s. ,,
	Portmanteau makers	35s. to 45s. ,,	35s. ,,
Class XIX.—Wares not elsewhere included.			
Basket, wickerware ..	Wicker workers (piece work)	40s. to 50s. per week	40s. per week
	Pith cane, bamboo workers (piece-work)	30s. to 50s. ,,	40s. ,,
Bellows	Bellows makers ..	30s. to 45s. ,,	40s. ,,
Broom, brushware	Millet broom makers	35s. to 50s. ,,	40s. ,,
	Hair broom, brush makers	40s. to 55s. ,,	45s. ,,
Cork cutting	Cork cutters ..	30s. to 40s. ,,	35s. ,,
Rubber goods (including cycle tires)	Rubber workers, expert	60s. to 90s. ,,	60s. ,,
	,, ordinary	35s. to 50s. ,,	37s. 6d. ,,
	Trimmers, finishers, and small rubber goods makers—female	15s. to 25s. ,,	20s. ,,
Quarry	Quarrymen ..	36s. to 54s. ,,	45s. ,,
	Stonebreakers ..	2s. to 2s. 6d. per c. yd. (2½ in.)	..
	Labourers	36s. to 42s. per week	42s. per week

WAGES IN MELBOURNE, 1904.

B.—Rates of Wages ruling in Melbourne during 1904 for Servants and Adult Workers in Unclassified Trades and Industries.

*** NOTE.—This statement has been compiled from information collected direct from employers or their agents.

Industry and Service.	Occupations.	Wages.	
		Range.	General Rate.
Educational*	Governesses ..	£20 to £40 per annum	..
	,, advanced	£40 to £60 ,,	..
	Teachers in private schools	£40 to £60 ,,	..
Clerical	Bookkeepers ..	50s to 60s. per week	..
	Shorthand clerks and typists	40s. to 50s. ,,	..
	Shorthand clerks and typists (female)	25s. to 40s. ,,	..
Domestic servants*—males ..	Coachmen, footmen, grooms, gardeners	15s. to 30s. ,,	20s. per week
	Butlers	20s. to 40s. ,,	25s. ,,
,, ,, females	Cooks	15s. to 30s. ,,	20s. ,,
	Laundresses ..	14s. to 20s. ,,	15s. ,,
	Housemaids ..	10s. to 15s. ,,	14s. ,,
	Nursemaids ..	8s. to 20s. ,,	15s. ,,
	General servants ..	10s. to 15s. ,,	12s. ,,
	Girls	5s. to 8s. ,,	7s. ,,
Hotel servants*—males ..	Barmen	20s. to 30s. ,,	25s. ,,
	Waiters	20s. to 30s. ,,	25s. ,,
	Boots	12s. 6d. to 25s. ,,	15s. ,,
	Ostlers	12s. 6d. to 25s. ,,	18s. ,,
	Cooks	20s. to 65s. ,,	25s. ,,
,, ,, females ..	Barmaids	15s. to 25s. ,,	20s. ,,
	Waitresses	10s. to 15s. ,,	12s. 6d. ,,
	Housemaids ..	10s. to 15s. ,,	12s. 6d. ,,
	Cooks	15s. to 30s. ,,	20s. ,,
Building, &c.	Bricklayers ..	10s. to 11s. per day	11s. per day
	Carpenters and joiners	9s. to 10s. ,,	10s. ,,
	Labourers	7s. to 8s. ,,	8s. ,,
	Masons	..	10s. ,,
	Painters and glaziers	8s. to 9s. ,,	9s. ,,
	Paperhangers ..	..	9s. ,,
	Plasterers	..	10s. ,,
	Plumbers	..	10s. ,,
	Plumbers, licensed sanitary	11s. to 12s. ,,	11s. ,,
	Signwriters and Decorators	..	10s. ,,
	Slaters	..	10s. ,,
Bakehouse	Bakers, bread ..	48s. to 52s. per week	50s. per week
	,, ,, (foremen)	54s. to 80s. ,,	..
	,, pastry (1st class)	52s. to 70s. ,,	52s. ,,
	,, ,, (2nd class)	43s. 4d. to 50s. ,,	43s. 4d. ,,
Butchering	Slaughtermen ..	50s. to 70s. ,,	50s. ,,
	Shopmen	55s. to 80s. ,,	55s. ,,
	General butchers ..	..	45s. ,,
	Small goods men ..	55s. to 80s. ,,	55s. ,,
	Drivers	35s. to 45s. ,,	35s. ,,
Laundry	Laundresses—female	20s. to 24s. ,,	20s. ,,
Photography	Photographers ..	60s. to 120s. ,,	..
	Printers	30s. to 60s. ,,	50s. ,,
	Retouchers—female ..	20s. to 35s. ,,	20s. ,,
	Finishers	15s. to 30s. ,,	20s. ,,
	Makers of photographic materials	36s. to 80s. ,,	45s. ,,
	Finishers, packers—female	17s. 6d to 25s. ,,	17s 6d. ,,

* With board and lodging.

The sums expended in connexion with the whole of the factories of the State during 1904 were—for wages, £4,794,365; on fuel and light, £375,214; and for materials, £13,356,103. The total value of the articles produced was £23,126,180 which gives £4,600,498, to cover profits, rent, interest, and some minor unclassified expenses. The following statement contains full particulars:—

—	Value 1904.	Proportion per cent.
	£	
Wages	4,794,365	20·7
Fuel	375,214	1·6
Materials...	13,356,103	57·8
	18,525,682	80·1
Articles produced	23,126,180	100·0
Margin for profit and miscellaneous expenses	4,600,498	19·9

The percentage statement of this table is somewhat similar to that which has been obtained for New South Wales and New Zealand, published in the *Statistical Account of Australia and New Zealand* for 1903-4, p. 971, viz.:—

Wages	21·4
Fuel and materials	57·4
Margin for profit and miscellaneous expenses ...	21·2
	100·0

The larger expenditure on wages here shown for New South Wales and New Zealand, as compared with Victoria, arises mainly from the fact that there is in Victoria a larger number of females, and a lesser number of males employed.

In 1904, the numbers for New South Wales and Victoria were as follow:—

	Males.	Females.
Victoria	50,554	25,733
New South Wales ...	53,480	14,494

In addition to the factories thus dealt with, there are a number of small establishments were goods are made up, but respecting which no statistics have been collected. It has been found impossible, from want of data, to frame a reliable estimate of the value of the work done in these establishments.

The following particulars are furnished respecting the more important industries of the State:—

Tanneries, fellmongeries, and wool-washing establishments.

The number of tanneries, &c., decreased by eight during 1904, when 86 were in operation. The hands employed also decreased from 1,640 to 1,439. The wages paid last year to the hands (excluding working proprietors) amounted to £113,869. The approximate values of the machinery, plant, land, buildings, and improvements during the same period were:—

VALUE OF TANNERIES: RETURN FOR FIVE YEARS.

Year.	Approximate Value of—		
	Machinery and Plant in Use.	Land.	Buildings and Improvements.
	£	£	£
1900	91,530	51,250	117,960
1901	99,710	47,750	98,950
1902	103,329	54,179	104,114
1903	110,796	48,341	112,407
1904	109,095	41,979	104,005

Tannery operations during the past year were carried on in 2,833 pits, where 8,983 tons of bark were used. The output was:—

OUTPUT OF TANNERIES: RETURN FOR FIVE YEARS.

Year.	Number Tanned of—			Sheep Skins Stripped.	Wool Washed (weight after washing).
	Hides.	Calf Skins.	Sheep and other Skins.		
	No.	No.	No.	No.	lbs.
1900 ...	500,549	165,802	1,395,600	1,431,811	6,866,383
1901 ...	496,260	181,522	676,936	615,614	8,511,171
1902 ...	424,786	189,886	313,166	453,660	5,279,916
1903 ...	397,367	179,425	629,465	925,263	6,197,723
1904 ...	381,473	134,003	674,105	643,532	5,166,200

The columns "Hides" and "Calf Skins" include the number of skins dealt with in small tanneries; but these are not included in the regular lists. The work done in these small tanneries was the tanning of 2,903 hides, 3,977 calf skins, and 9,806 sheep and other skins.

The value of the leather imported into Victoria in 1904 was £234,433, of that exported, £286,171. The export of Victorian leather was valued at £232,398.

Soap and candle works.

There were 19 soap and candle works in operation in 1904—one less than in the previous year. The hands employed numbered 492 (of whom 11 were females), including 17 working proprietors and 13 managers. The value of the machinery, plant, land, and buildings

and improvements was £210,053 in 1903, and £202,742 in 1904—a decrease of £7,311. The return for the last five years are:—

SOAP AND CANDLE WORKS—VALUE AND PRODUCTS: RETURN FOR FIVE YEARS.

Year.	Approximate Value of—			Products Made.	
	Machinery and Plant in Use.	Land.	Buildings and Improvements.	Soap. (Including that made in small Factories.)	Candles.
	£	£	£	cwt.	cwt.
1900 ...	95,114	42,675	58,049	133,678	46,624
1901 ...	97,260	42,870	60,940	143,140	47,313
1902 ...	91,325	39,967	56,852	165,188	49,406
1903 ...	103,411	42,288	64,354	151,414	45,052
1904 ...	101,486	38,295	62,961	170,028	41,521

The amount of wages paid to the hands employed was £39,366.

The quantity of soap, perfumed and other, imported during 1904 was 1,388,852 lbs., valued at £17,740; the quantity exported was 3,997,321 lbs., of which 3,625,039 lbs. was Victorian made. The former was valued at £36,095, and the latter at £31,885. The quantity of candles imported was 1,350,455 lbs., valued at £27,667; and the exports 1,006,914 lbs., valued at £21,446, including 738,053 lbs. of Victorian-made candles, valued at £15,625. The quantity of tallow used in the manufacture of soap and candles was 141,439 cwt.

Brickyards, potteries, earthenware, &c.

The brickyards during the year increased from 110 to 111, but the number of hands decreased from 1,581 to 1,432. The latter number (of whom 30 were females) included 123 working proprietors (of whom 1 was a female) and 33 managers and overseers. The sum of £102,980 was paid to the employés; and the value of land, plant, buildings, &c., was £251,105. The estimated value of the bricks made was £129,138.

The number of bricks made, and the value of pottery and of pipes and tiles manufactured during the last five years, were returned as follow:—

POTTERY, PIPES AND TILES: RETURN FOR FIVE YEARS.

Year.	Number of Bricks Made.	Value of -	
		Pipes and Tiles.	Pottery.
		£	£
1900	85,387,275	55,751	19,870
1901	86,769,000	73,060	23,695
1902	92,503,080	71,074	27,289
1903	79,105,831	81,732	34,572
1904	80,711,511	53,454	31,438

NOTE.—The number of bricks includes those made in small brickyards.

The following is a statement of the limestone raised for making lime during the last five years:— Lime works.

LIMESTONE RAISED: RETURN FOR FIVE YEARS.

Year.	Cubic Yards.	Estimated Value.
		£
1900	75,064	35,186
1901	81,098	38,014
1902	79,328	37,185
1903	82,148	38,507
1904	82,438	38,642

Forest saw-mills were established for the purpose of cutting native timber at or near the place where it is grown. The number of these mills during the last year was 128, or three more than in 1903. The number of hands employed in 1904 was 1,698, of whom 161 were working proprietors, and 46 were managers and overseers. The wages paid amounted to £103,071. The approximate value of machinery, plant, land, buildings, improvements, together with the quantity and value of timber sawn during the last five years appears in the following statement:— Forest saw-mills.

Year.	Approximate Value of—			Timber Sawn.	
	Machinery and Plant in use.	Land.	Buildings and Improvements.	Quantity.	Value.
	£	£	£	Super ft.	£
1900	104,500	7,520	27,350	44,782,330	125,121
1901	91,810	6,170	13,500	46,495,885	134 310
1902	81,898	6,380	11,854	40,494,660	128,430
1903	80,039	1,495*	10,797	38,841,322	116,845
1904	89,760	1,966*	12,301	49,250,000	147,750

The other factories working in wood number 140, comprising—cooperage and cork-cutting works (12), employing 84 males, and paying £6,387 in wages; dairy and domestic implements and bellows (6), employing 99 males and paying £9,004 in wages; saw-milling, moulding, and joinery works (87), employing 1,577 males and 9 females, and paying £137,790 in wages; mantelpiece (4), employing 120 males and 1 female, and paying £10,799 in wages; and wood carving and turnery (29), employing 157 males and 2 females, and paying £7,504 in wages. The total amount paid in wages to workers in wood, other than those employed in forest saw-mills, was £171,484; and the approximate value of land, buildings, machinery, &c., in use in the works, was £304,823.

* Value of land occupied by saw-mills only.

Forest production.

As the result of an investigation, it has been estimated that the average consumption of firewood in each household is about 3 tons per annum, and that the total consumption of the State is therefore about 750,000 tons, of the approximate value of £380,000.

In addition, there are supplies of railway sleepers, piles, posts and rails, shingles, and timber for mines, obtained from the forests, but it has been found impossible to procure reliable information as to their value.

The revenue derived from forest royalties and licences is as under:—

No	—	Revenue.	Total.
		£ s. d.	£ s. d.
	Saw-mill Industry—		
118	Mill site Licences	1,130 11 8	
175	Fellers' and Haulers' Licences ...	393 5 6	
144	Royalty Permits	3,133 1 4	
			4,656 18 6
	Other Timber Operations—		
4340	Royalty Permits	8,534 19 2	
1900	Priced Splitters' Licences ...	499 7 7	
			9,034 6 9
206	Wattle Stripping Permits	...	1,909 10 8
			15,600 15 11

Bacon and ham curing.

The establishments connected with this industry increased from 24 in 1903 to 25 in 1904. The number of hands employed also increased from 256 to 288. The approximate value of machinery and plant in use last year was £27,822; of land, £5,641; and of buildings and improvements, £25,730; and the wages paid to employés amounted to £24,071.

The following gives details of the industry for the five years ended 1904:—

BACON CURING: RETURN FOR FIVE YEARS.

Year.	Approximate Value of—			Pigs Slaughtered for Curing.	Weight of Bacon and Hams Cured.
	Machinery and Plant.	Land.	Buildings and Improvements.		
	£	£	£	No.	lbs.
1900 ...	23,210	7,680	25,200	109,619	10,267,778
1901 ...	27,900	8,690	27,670	112,428	11,696,710
1902 ...	29,611	9,231	30,625	114,539	11,702,322
1903 ...	26,810	5,721	23,415	90,979	9,814,951
1904 ...	27,822	5,641	25,730	106,728	11,423,870

NOTE.—The columns, "Pigs Slaughtered" and "Weight of Bacon and Ham Cured," included the number and quantity dealt with in small factories. These are not included in the regular list.

In addition, the following quantities of bacon and hams were returned as having been cured on farms, viz.:—2,936,769 lbs. in 1900, 3,314,906 lbs. in 1901, 2,736,048 lbs. in 1902, 2,689,900 lbs. in 1903, and 3,428,074 lbs. in 1904. The total for the State in 1904 was thus 14,851,944 lbs.

Import and export of bacon and hams.

The import of bacon and hams in 1904 was 450,466 lbs., valued at £13,541, and 3,410,312 lbs., valued at £121,412, were exported, including 3,057,453 lbs., valued at £108,750, cured in Victoria.

Butter and cheese factories.

The number of butter and cheese factories (including 1 butterine factory) exclusive of creameries, was 214 in 1904. The great majority of these employed steam power. There was an increase of 7 from the previous year. Of the factories in operation in 1904, 167 made butter, 9 made butter and cheese, 5 made butter and concentrated milk, 32 made cheese only, and 1 made butterine. In 1904 there were 266 creameries, the maximum number being 399 in 1900. In 1904 the horse power of the engines used in factories and creameries was 2,954. The number of hands employed in 1904 was 1,400, an increase of 81 over the previous year. The approximate value of machinery, plant, land, buildings, and improvements in 1904 was £522,411, or £2,037 less than in 1903. The quantity of milk received at the factories and creameries increased from 77,520,000 gallons in 1895—the first year in which a record was kept—to 129,640,181 gallons in 1904.

The output from butter and cheese factories during the last five years was:—

BUTTER AND CHEESE FACTORIES: RETURN FOR FIVE YEARS.

Year.	Butter.	Cream Sold.	Cheese.	Concentrated Milk Made.
	lbs.	gallons.	lbs.	gallons.
1900 ...	48,839,996	38,274	2,508,843	263,138
1901 ...	40,824,928	50,092	2,073,940	266,083
1902 ...	32,927,546	23,739	2,128,835	243,904
1903 ...	40,707,377	17,882	3,602,988	236,581
1904 ...	55,058,391	7,242	2,599,443	226,810

Butter and cheese made on farms.

In addition to the quantity of butter and cheese made in the factories, the following quantities were returned as having been made on farms, viz.:—Butter, 6,764,122 lbs. in 1900, 6,032,644 lbs. in 1901, 6,300,208 lbs. in 1902, 5,978,350 lbs. in 1903, and 5,944,450 lbs. in 1904; cheese, 1,775,327 lbs. in 1900, 1,900,728 lbs. in 1901, 1,720,726 lbs. in 1902, 2,078,527 lbs. in 1903, and 2,148,408 lbs. in 1904.

Butter and cheese made in factories and on farms.

Taking the returns of butter from all sources, the largest quantity, 61,002,841 lbs., was made in 1904. The largest quantity of cheese returned was 5,681,515 lbs. in 1903. Previously, the largest return was 5,052,782 lbs. in 1895.

Import and export of butter.

The import of butter was 1,294,119 lbs., valued at £45,948; and the export 41,861,116 lbs., valued at £1,606,018; 40,792,958 lbs. of the latter, valued at £1,563,517 being Victorian butter.

Import and export of cheese.

The total quantity of cheese made in factories and on farms was 4,747,851 lbs.; 288,993 lbs., valued at £7,094, was imported from abroad; and 1,569,894 lbs., valued at £32,949, was exported, including 1,426,661 lbs. of Victorian cheese, valued at £29,860.

Meat freezing and preserving works.

The number of works for freezing and preserving meat increased from 6 in 1895 to 19 in 1904, the horse power from 529 to 1,240, and the number of hands from 238 to 456. The approximate value of machinery, plant, land, buildings, and improvements in 1904 was £263,464. The output was:—

MEAT FREEZING AND PRESERVING: RETURN FOR FIVE YEARS.

Year.	Frozen.			
	Sheep.	Cattle.	Rabbits.	Poultry.
	No.	Qrs.	No.	No.
1900	437,242	16,096	4,840,128	44,050
1901	417,721	6,395	3,990,460	71,490
1902	375,178	1,338	6,218,422	34,228
1903	294,906	1,424	5,861,741	41,460
1904	459,963	3,394	7,128,175	22,635

Year.	Preserved.			
	Beef.	Mutton.	Rabbits.	Fish.
	Cwt.	Cwt.	Cwt	Cwt.
1900	5,593	2,198	24,874	831
1901	3,304	2,417	26,303	1,140
1902	7,705	14,913	16,537	2,134
1903	8,796	2,653	17,380	4,492
1904	4,248	491	14,977	535

Imports and exports of frozen and preserved meats.

The following is a statement showing the imports and exports of frozen and preserved meats during 1904:—

—	Imports (including transfers from other States).		Exports.	
	Quantity.	Value.	Quantity.	Value.
Frozen—		£		£
Mutton	...	...	15,431,119 lbs.	238,047
Beef	24,914 lbs.	288	1,767,499 "	26,838
Pork	56,250 "	720	202,250 "	3,363
Rabbits and Hares	13,291 "	61	...	126,587
Poultry	63,798 "	1,182	...	4,566
Game	2,013 "	136	14,129 "	564
Other meats	141,286 "	1,838	133,350 "	1,320
Meats—Fresh and smoked ...	1,203,676 "	4,606	26,606 "	338
" Potted and concentrated	...	7,656	...	734
" Preserved in tins ...	485,483 "	15,733	2,700,501 "	49,879
" Not elsewhere included	1,451 cwt	2,454	1,219 cwt.	2,249
Total value ...	...	34 674	..	454,485

These mills decreased in number by 6 and the hands by 34 since 1900, whilst an increase of 135 took place in the horse-power of the engines. The approximate values of machinery, plant, land, buildings, and improvements, the wheat operated on for flour, and the quantity of flour made during the last five years, were as follow:— Flour mills.

FLOUR MILLS: RETURN FOR FIVE YEARS.

Year.	Approximate Value of—			Wheat Operated on for Flour.	Flour Made.
	Machinery and Plant.	Land.	Buildings and Improvements.		
	£	£	£	bushels.	tons.
1900	297,880	74,442	184,470	8,387,323	169,739
1901	280,130	70,530	175,520	9,482,175	190,845
1902	256,980	76,121	171,125	8,491,224	170,696
1903	261,530	68,917	166,869	5,762,849	115,368
1904	235,508	52,220	147,559	10,012,476	202,314

During the year 1,600,579 lbs. of Victorian biscuits, valued at £28,209, and 97,018,000 lbs. of Victorian flour, valued at £364,705, were exported; as well as 132,021 lbs. of biscuits, valued at £3,093, and 2,022,000 lbs. of flour, valued at £8,237, received from outside the State. The imports were 311,400 lbs. of biscuits, valued at £9,117, and 1,406,000, lbs. of flour, valued at £5,318. Import and export of bread-stuffs.

The two sugar refineries working in 1904 employed engines of 506 horse-power and 343 hands, treated 1,123,381 cwt. of raw (cane) sugar, and produced 1,071,995 cwt. of refined sugar, and 36,803 cwt. of refined treacle. Full particulars will be found in the following table:— Sugar refineries.

SUGAR REFINERIES: RETURN FOR FIVE YEARS.

Year.	Sugar Refineries.		Actual Horse-power of Engines Used.	Average Number of Hands Employed.	Approximate Value of—			Cane Sugar Treated (Raw).	Refined Sugar Made.	Refined Treacle Made.
	Total Number.	Using Steam Engines.			Machinery and Plant.	Land.	Buildings.			
					£	£	£	cwt.	cwt.	cwt.
1900	2	2	424	301	74,500	7,000	56,000	1,004,913	944,049	34,080
1901	2	2	424	324	74,500	7,000	56,000	1,129,586	1,052,742	40,320
1902	2	2	424	346	82,000	10,000	76,500	952,801	879,521	51,052
1903	2	2	474	344	83,500	10,000	76,500	1,087,005	1,025,583	51,109
1904	2	2	506	343	83,500	10,000	76,500	1,123,381	1,071,995	36,803

Breweries.

The number of breweries in 1904, 45, was five less than in 1900, and the number of hands employed decreased from 1,096 to 1,002. The approximate value of the machinery, plant, land, buildings, and improvements, the quantities of materials used, and the beer made during the last five years, were :—

BREWERIES : RETURN FOR FIVE YEARS.

Year.	Approximate Value of—			Materials Used—			Beer Made.
	Machinery and Plant.	Land.	Buildings and Improvements.	Sugar.	Malt.	Hops.	
	£	£	£	cwt.	bushels.	lbs.	gallons.
1900 ...	204,840	230,530	269,410	111,863	598,094	648,648	16,162,550
1901 ...	212,280	236,310	271,600	113,686	608,445	650,214	16,563,068
1902 ...	211,036	228,990	273,325	115,258	625,441	677,262	17,162,680
1903 ...	209,492	229,965	277,383	102,651	552,042	569,981	15,423,149
1904 ...	231,687	229,965	291,180	100,430	530,771	544,524	14,927,873

NOTE.—The columns under "Materials Used" and "Beer Made" include those of small breweries, not included in the regular list.

Distilleries.

The distilleries decreased from 9 in 1900 to 5 in 1904, the hands from 143 to 24, the estimated value of machinery, plant, land, buildings, and improvements from £146,450 to £19,365, and the horse-power of the engine from 58 to 23.

The materials used in the manufacture, and the quantity of spirits distilled, were :—

DISTILLERIES : RETURN FOR FIVE YEARS.

Year.	Materials Used.							Spirits Distilled.
	Wine.	Malt.	Wheat.	Maize.	Other Grain.	Sugar and Molasses.	Beer.	
	Gal.	Bush.	Bush.	Bush.	Bush.	lbs.	Gal.	Proof gal.
1900	160,301	91,223	2,353	3,692	26	4,652,480	...	439,117
1901	148,584	123,394	1,541	16,000	2,464	2,853,760	2,265	490,550
1902	128,272	16,744	87	11,880	2,507	1,780,016	...	190,644
1903	207,621	...	...	...	...	...	1,187	41,083
1904	293,836	...	...	...	...	...	...	58,745

Spirits made by vine-growers for fortifying wine are not included in the previous table. The following quantities were distilled during the last five years in vineyards for that purpose :—30,554 gallons in 1900, 38,058 gallons in 1901, 49,867 gallons in 1902, 56,851 gallons

in 1903, and 73,210 gallons in 1904. The following are the quantities of Victorian spirits consumed (*i.e.* duty paid) in the years named:—194,345 gallons in 1900, 297,486 gallons in 1901, 234,986 gallons in 1902, 189,068 gallons in 1903, and 253,555 gallons in 1904.

In some of the leading distilleries no spirit has been distilled since the imposition of the new duties. To the reduction of the differential duty, from 4s. to 1s. per gallon, the distillers have ascribed the great falling-off in this industry.

Jam, pickle and sauce works.

The number of jam, pickle, and sauce factories increased from 21 in 1899, to 27 in 1904; the horse-power of engines used from 214 to 252; the hands employed from 1,316 to 1,503. The value of the machinery, plant, lands, and buildings, also increased during the same period from £87,330 to £120,299.

The following statement shows the quantity of materials used, and the output of jam, pickle, and sauce factories during the year:—Fruit used, 199,306 cwt.; sugar used, 97,057 cwt.; jams and jellies made, 190,151 cwt.; fruit preserved, 22,408 cwt.; fruit pulped 115,295 cwt.; sauce made, 10,048,615 pints; pickles made, 444,963 pints.

The value of the imports of pickles and sauces was £14,546; that of the exports of these goods £18,983. The value of the jam imported was £10,119; of that exported £11,738.

Salt works.

The number of factories decreased from 5 in 1900 to 4 in 1904; the hands employed from 76 to 54; the approximate value of machinery, plant, lands, and buildings increased from £24,300 to £31,988.

The following table contains full particulars for the past five years:—

SALT WORKS: RETURN FOR FIVE YEARS.

Year.	Number of Manufactories.	Number using Machinery.	Hands Employed.	Approximate Value of—			Crude Salt Raised	
				Machinery and Plant in use.	Land.	Buildings and Improvements.	Quantity.	Value.
				£	£	£	Tons.	£
1900	5	2	76	2,650	700	20,950	5,326	3,995
1901	5	2	72	4,550	700	24,080	7,118	5,339
1902	4	1	59	4,150	410	24,660	7,147	5,360
1903	3	1	63	4,300	400	26,025	9,374	7,030
1904	4	2	54	4,675	690	26,623	2,739	2,053

Tobacco, &c. manufactories.

These decreased from 14 in 1900 to 9 in 1904, but there was an increase in the number of hands employed from 1,176 to 1,324, while during the same period there was a decrease in the horse-power of the engines used of from 131 to 113, and in the value of machinery, plant, land, buildings, and improvements from £175,080 to £169,778.

The quantity of material used and the output from 1900 to 1904 were:—

TOBACCO FACTORIES: RETURN FOR FIVE YEARS.

Year.	Unmanufactured Leaf.			Quantity Manufactured of—			
	Imported Duty Paid.	Operated on.		Tobacco.	Snuff.	Cigars.	Cigarettes.
		Imported.	Colonial.				
	lbs.	lbs.	lbs.	lbs.	lbs.	No.	No.
1900	1,743,280	1,661,632	276,407	1,722,236	794	11,584,442	111,010,705
1901	2,742,653	2,542,580	230,113	2,365,831	1,133	13,025,840	125,693,600
1902	969,602	1,379,905	205,434	1,630,510	550	11,936,455	100,817,104
1903	1,910,558	2,052,100	304,049	2,390,976	813	9,336,975	58,928,535
1904	2,597,035	2,768,873	266,053	3,166,767	1,122	12,419,426	73,304,100

NOTE.—The figures in the above table include the imported leaf operated upon. The quantity manufactured in small factories (£5 licences) is also included, but does not appear in the regular list.

The total consumption of tobacco in 1894, 1899 and 1904, was—

Year.	Total Consumption.	
	Quantity.	Average per Head.
	lbs.	lbs.
1894	2,266,000	1·93
1899	2,492,879	2·10
1904	2,771,332	2·29

Woollen mills.

These mills increased from 9 in 1900 to 10 in 1904; the horse-power of the engines from 1,305 to 1,719, the number of hands from 1,013 to 1,231, and the approximate value of the machinery, plant, land, buildings, and improvements from £263,310 to £306,889, during the same period. The quantities of wool and cotton used, and of goods manufactured, were:—

WOOLLEN MILLS: RETURN FOR FIVE YEARS.

Year.	Quantity of Scoured Wool Used.	Quantity of Cotton Used.	Goods Manufactured—			
			Tweed and Cloth.	Flannel.	Blankets.	Shawls and Rugs.
	lbs.	lbs.	yards	yards.	No. of Pairs.	No.
1900 ...	1,831,000	178,332	971,267	1,596,120	56,340	3,500
1901 ...	2,023,509	250,184	818,975	2,229,617	49,302	4,600
1902 ...	2,149,897	273,335	708,749	2,612,343	67,609	5,718
1903 ...	2,130,100	368,749	662,381	3,201,275	77,601	6,565
1904 ...	2,368,871	211,256	697,726	3,301,004	86,253	8,431

These factories increased from 108 in 1900 to 131 in 1904, the horse-power of the engines from 316 to 508, the number of hands from 4,812 to 5,655, and the approximate value of machinery, plant, land, buildings, and improvements from £204,080 to £241,342. The following are the quantities of goods manufactured each year from 1900 to 1904:— Boot factories.

BOOT FACTORIES: RETURN FOR FIVE YEARS.

Year.	Goods Manufactured—*		
	Boots and Shoes.	Boot and Shoe Uppers for other than Factory use.	Slippers.
	No. of pairs.	No. of pairs.	No. of pairs.
1900 ...	3,446,809	18,639	66,740
1901 ...	3,125,799	66,057	92,174
1902 ...	3,613,487	72,391	216,483
1903 ...	3,574,761	99,222	150,012
1904 ...	4,099,881	64,216	189,108

* Including output of small factories not included in regular list.

NOTE.—The number of slippers returned for 1902, 1903, and 1904 includes canvas shoes and house-boots, which were not returned previous to the these years.

The value of boots and shoes imported into the State during 1904 was £93,123; the value of the exports was £327,787, including £280,895 worth of Victorian manufacture, the main portion of which was to the adjoining States.

The number of electric light works decreased from 10 in 1900 to 7 in 1904 (due to amalgamation of works in the city of Melbourne); the horse-power of the engines increased from 4,235 to 5,226, and the number of hands employed from 176 to 222. The approximate value of machinery, plant, land, buildings, and improvements, also the quantity of electricity supplied, are set forth in the following table for the period under review:— Electric light works.

ELECTRIC LIGHT WORKS: RETURN FOR FIVE YEARS.

Year.	Approximate Value of—			Electricity Supplied.
	Machinery and Plant.	Land.	Buildings and Improvements.	
	£	£	£	British Units.
1900 ...	145,580	16,060	37,700	6,100,519
1901 ...	220,690	15,240	86,730	6,680,214
1902 ...	204,022	10,000	67,661	6,450,560
1903 ...	198,751	9,750	76,733	5,626,568
1904 ...	374,850	12,085	98,809	6,644,343

Gasworks.

Forty-eight gasworks were in operation in 1904, and 46 in 1900. An increase from 345 to 568 took place in the horse-power of engines in use, and from 632 to 872 in the number of hands employed. In the value of machinery, plant, and buildings and improvements, an increase from £1,198,280 to £1,731,031 is reported for the same period.

The quantities of coal used, of gas made, and of coke produced, during the period under review, are shown hereunder :—

GAS WORKS: RETURN FOR FIVE YEARS.

Year.	Coal Used.	Gas Made.	Coke Produced.
	tons.	cubic feet.	tons.
1900 ...	153,455	1,516,531,100	77,255
1901 ...	159,374	1,567,649,380	84,546
1902 ...	169,356	1,642,652,799	92,308
1903 ...	166,018	1,628,889,400	94,947
1904 ...	166,307	1,649,396,000	97,357

In addition to the coal used, 108,531 gallons of oil in 1902, 105,651 in 1903, and 117,114 in 1904, were also consumed.

The increases which appear for 1904 in relation to electric light and gasworks, are principally due to the fact that the hands employed in the distribution of the product, and the value of the distributing plant, which have been for some years excluded, are now again included.

Total production.

In the year 1903, it was only practicable to publish a partial return, showing the value of the various industries of the State. For 1904, however, effort has been made to procure as full particulars as possible in this direction, and the result appears in the following table :—

ESTIMATED VALUE OF VICTORIAN PRODUCTS, 1904.

—		Produce.	Value.
Cultivation.			£
Wheat	bushels	21,092,139	3,119,878
Oats	"	6,203,429	465,257
Barley, Malting	"	575,505	92,320
Barley, Other	"	298,594	31,103
Maize	"	623,736	79,967
Other Cereals	"	231,723	34,758
Grass and Clover Seed	"	27,300	6,825
Potatoes	tons	92,872	417,150
Onions	"	12,969	116,721
Other Root Crops	"	20,043	35,075
Hay	"	514,316	861,479
Straw	"	385,108	96,277
Green Forage	acres	29,902	74,755
Tobacco	"	106	1,219
Grapes, not made into wine, &c. ...	cwt.	63,718	28,678
Raisins	lbs.	3,393,117	49,526

ESTIMATED VALUE OF VICTORIAN PRODUCTS, 1904—*continued.*

—		Produce.	Value.
			£
Cultivation—continued.			
Currants	lbs.	669,108	9,757
Wine	gallons	1,832,386	83,984
Hops	cwt.	1,449	9,419
Other Crops	acres	3,280	27,880
Orchards and Gardens growing Fruit for sale	"	47,205	365,493
Orchards and Gardens, Private ...	"	5,546	11,092
Market Gardens	"	7,904	197,600
Total		...	6,216,213
Dairying and Pastoral.			
Milk Consumed in Natural State ...	gallons	28,309,218	648,752
Butter made	lbs.	61,002,841	2,414,695
Cheese made	"	4,747,851	89,022
Cream made (not for butter) ...	gallons	34,117	8,529
Concentrated Milk...	"	226,810	39,691
Horses produced	No.	16,538	198,456
Cattle "	"	250,079	1,740,767
Sheep "	"	1,989,636	1,429,970
Pigs "	"	189,833	380,616
Wool, Exported (net). Customs Value	lbs.	71,759,096	3,376,015
Wool, used by Manufacturers in State	"	4,027,080	167,795
Total		...	10,494,308
Mining.			
Gold	ozs.	821,017	3,252,045
Coal	tons	121 741	70,208
Stone from Quarries	...	...	44,943
Limestone	...	...	38,642
Salt (crude)	...	...	2,053
Other Metals and Minerals	...	...	12,245
Total		...	3,420,136
Forest Produce.			£
Timber (Forest Saw-mills only) ...	...	...	147,750
Firewood (estimated)	...	...	380,000
Bark for Tanning	...	...	82,817
Total		...	610,567
Miscellaneous.			
Honey and Beeswax	...	...	21,408
Poultry production	...	...	1,491,550
Rabbits, Hares, and Game	...	...	137,590
Fish	...	...	75,023
Total		...	1,725,571
Total Value of Primary Products		...	22,466,795
Manufacturing. Value added during process...		...	9,185,238*
Grand Total		...	31,652,033

* Exclusive of butter and cheese factories and forest saw-mills.

Production per head of population.

The mean population of the State for the year 1904 was 1,207,537, and the figures of this table show the value of production per head to be as under:—

	Per Head of Population.		
	£	s.	d.
Cultivation	5	2	11½
Dairying and pastoral	8	13	9¾
Mining	2	16	7¾
Forest produce	0	10	1¼
Honey and beeswax, Poultry, Rabbits, hares, and game, Fish ...	1	8	7
Primary products	18	12	1¼
Manufacturing	7	12	1½
Total	26	4	2¾