PART VIII.—PRODUCTION.

Alienation of Crown lands.

382. The mode of disposing of Crown lands in Victoria has undergone numerous changes, a full description of which has been given in previous issues of this work.* The present system dates from the 29th December, 1884, when the *Land Act* 1884—which, with subsequent amendments, was consolidated by the *Land Act* 1890†—came into operation.‡ Its main features are to restrict the further alienation of the public estate by limiting the extent which may be sold by auction, and by substituting for the previously existing method of selecting agricultural land a system of leasing such lands in certain defined areas, at the same time conserving to the lessee the privilege of acquiring from his leasehold the fee-simple of 320 acres by means of deferred payments. The Act classifies the whole of the unalienated Crown lands—exclusive of the "Mallee country," which is dealt with separately, as follows:—Pastoral lands, grazing and agricultural lands, auriferous lands, lands which may be sold by auction, swamp lands, State forest reserves, timber reserves, and water reserves. The area of land comprised within each of the above classes respectively is delineated by projections bearing a distinguishing colour or shading on maps of the several counties in which such land is situated. These maps are deposited with the Clerk of Parliaments. The Governor in Council may, however, by proclamation increase or diminish the area comprised in any of the above-mentioned classes, except those relating to lands which may be sold by auction.

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* See *Victorian Year-Book* 1889-90, Vol. II., paragraphs 375 to 381.

† 54 Vict. No. 1,106.

‡ Towards the close of 1891 an *Amending Land Act* was passed, the principal features of which are as follow, viz. :—The areas, which may be leased as pastoral allotments, are from 7,500 to 40,000 acres. The right to select a homestead is restricted. The shape of the block must be approved by the Minister of Lands. No land which it is undesirable to alienate can be selected, and, if thought necessary, a condition may be inserted in the lease denying the power of selection altogether. Two or more grazing areas (Section 32 *Land Act* 1890) may be taken up, providing that the total area do not exceed 1,000 acres. More than one agricultural allotment may be selected, if the total area do not exceed 320 acres. Agricultural allotments may be applied for direct, if the blocks do not exceed 320 acres each, the applicant not being required to first obtain a grazing area lease. Licences to graze on auriferous lands (Section 67 *Land Act* 1890) may be renewed for a period of seven years, expiring, however, not later than 29th December, 1898. Land is to be sold, leased, or licensed as regards the surface only, and to such depth below the surface as the Governor-in-Council may direct. Isolated blocks, not exceeding 20 acres in extent, which it is thought advisable to sell, or land required for church or charitable purposes, not exceeding 3 acres in extent, may be sold. Where the value of land is enhanced by railway or irrigation works, the price to be paid for such land may be increased by Order-in-Council. Auriferous lands, which are found on inquiry to be "worked out," may be licensed for a period of seven years for residence, business purposes, or cultivation, in blocks not exceeding 5 acres each. At expiration of term, if conditions of licence have been complied with, and purchase-money to the value of the land (less the amount paid as rent) be paid, Crown grant may be issued.

Pastoral occupation.

383. Under the *Land Act* 1890, the pastoral lands are leased in "pastoral allotments," capable of carrying from 1,000 to 4,000 sheep, or from 150 to 500 head of cattle, for any term not exceeding 14 years from the 29th December, 1884,* at the end of which the land, together with all improvements thereon—taken at a valuation as below mentioned—reverts to the Crown, the right to the lease being granted to the first person who applies for the land after it has been first publicly notified as available; but if there should be two or more applicants, the lease must be offered at auction. The annual rent payable for pastoral allotments is computed according to the grazing capability of the land, at the rate of 1s. per head of sheep and 5s. per head of cattle, upon a basis of not more than 10 acres to a sheep, and the equivalent number of acres for cattle. The principal conditions of the lease are that all "vermin" (rabbits, native dogs, etc.) upon the land shall be destroyed within the first three years, and that all buildings and improvements shall be kept in good condition and repair. Upon the expiration of the lease, the lessee is to be paid by any incoming tenant the value of all improvements effected and calculated to increase the carrying capability of the land, at a price not exceeding the sum expended thereon, but in no case to exceed 2s. 6d. per acre. Alienation of pastoral lands is not permitted, except in the case of a lessee of a pastoral allotment, who has the right to purchase 320 acres as a homestead at any time during the currency of his lease.

Agricultural and grazing lands.

384. The agricultural and grazing lands are also leased in "grazing areas," varying in size, but not exceeding 1,000 acres, for any term not exceeding 14 years from the 29th December, 1884,* at the end of which term the land, together with all improvements—to be allowed for at a valuation limited to 10s. per acre—reverts to the Crown. The annual rent of a grazing area is appraised by valuers, but must in no case be less than 2d. or more than 4d. per acre, any improvements that may happen to be on the land at the commencement of the lease to be charged for in addition at the rate of 5 per cent. per annum on the capital value thereof. The only important conditions imposed on the lessee of a grazing area are that he shall, within the first three years, fence the land and destroy all "vermin" thereon. Any person over the age of 18 years is entitled to take up a grazing area; selectors, under former Acts, however, being limited to an area which, together with the land previously selected, must not exceed

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* The date when the *Land Act* 1884 came into operation.

1,000 acres. Residence is not required of the holder of a grazing lease, unless he should select portion of his holding under the terms and conditions specified in the next paragraph.

Selection of agricultural allotments.

385. Persons desirous of selecting an agricultural allotment cannot do so without first taking up a grazing area, but the lessee of a grazing area is at liberty, after the issue of his lease, to select out of the area leased a block or "agricultural allotment" not exceeding 320 acres in extent; but should he have selected under a previous Act or Acts, he is only entitled to increase his selection to such an extent as not to exceed 320 acres in all.* The selector then occupies the agricultural allotment (which is thereafter no longer considered portion of the grazing area) under licence during the first six years, within which period the licensee is obliged to reside on his selection at least five years, to enclose it, to cultivate 1 acre out of every 10, and generally to effect substantial improvements to the value of 20s. per acre. The rent payable during this period is 1s. per acre per annum, which is credited to the selector as part payment of the principal, viz., 20s. per acre without interest.† At the expiration of the six years' licence, the selector, if he obtains a certificate from the Board of Land and Works that he has complied with these conditions, can either purchase his holding at once by paying up the balance of 14s. per acre, or may convert his licence into a lease extending over fourteen years, at an annual rental of 2s. per acre, which is also credited to the selector as part payment of the fee-simple. On the expiry of such lease, and due payment of the rent, the land becomes the freehold of the selector. Other important features of the Act are that every selector—subject to certain conditions and restrictions—is entitled to a Crown grant of portion of his allotment not exceeding 20 acres, if planted as a vineyard or an orchard, upon payment of the balance of the purchase-money due in respect of such portion;‡ that the licensee of an agricultural allotment may, after the expiration of two years, obtain an advance of money (by giving a "licence lien") secured up to one-half of the improvements effected;‡ that married women are permitted to take up land as pastoral or grazing lessees, but are not allowed to select an agricultural allotment out of the grazing area leased to them; and that facilities are given to allow of a non-resident selector becoming a resident selector, and *vice versa*.‡

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* The law relating to selection was in some respects altered whilst these pages were passing through the press. See footnote (‡) to paragraph 382 *ante*.

† See paragraph 413 *post*.

‡ These privileges, although not previously enacted, are also to be allowed to selectors under previous Acts.

Non-residence selections.

386. Provision is also made in this Act for grazing area lessees to take up agricultural allotments as non-residence licensees. In such cases the rent is 2s per acre, and the total price payable for the land £2 per acre. Improvements to the value of £2 per acre, moreover, must be made during the six years licence, of which at least half must be made before the expiration of the third year. The area for which licences may be issued during any year for non-resident selection is limited to 50,000 acres.

Only one selection may be made.

387. Only one grazing area can be taken up by one person, and, consequently, if the area so taken up should be less than 1,000 acres in extent, the lessee is not allowed by any further selection to make up this quantity.* In like manner, if the agricultural allotment he selects from his grazing area is less than 320 acres, he cannot by any further selection add to it or make it up to 320 acres. This provision, does not, however, apply to selectors under former Acts, who if they have not selected as much as 320 acres, may, out of a new leasehold, convert into an agricultural allotment, and eventually into a freehold, as much as will, with their old selection, make up 320 acres.

Auriferous lands.

388. Auriferous lands not required for mining purposes, and not situated within a city, town, or borough, may be occupied under annual licence for purposes of residence or cultivation in areas not exceeding 20 acres; and for purely pastoral purposes, under licences renewable annually for periods not exceeding five years, in blocks not exceeding 1,000 acres.* No auriferous land is permitted to be alienated in fee-simple.

Swamp lands.

389. Swamp lands are to be first drained and may then be leased in areas not exceeding 160 acres for a term of twenty-one years.

Sales by auction.

390. The Statute, moreover, contains provision for the sale of Crown lands by auction at an upset price of £1 per acre, or such higher sum as the Governor in Council may direct, the whole extent to be sold in any one year not to exceed 200,000 acres.

Mallee pastoral leases.

391. Prior to the consolidation of the various Land Acts under the *Land Act* 1890, the occupation of the unalienated land situated in the north-western portion of the colony, comprising about one-fifth of its extent, or some 11½ million acres wholly or partially covered with the various species of stunted trees of which the "Mallee scrub" is composed, was specially provided for by the *Mallee Pastoral Leases Act* 1883, the provisions of which were repealed, and re-embodied in the Consolidated Act referred to, forming Part II. of that Act.

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* See account of provisions of *Amending Act* 1891, footnote (‡) to paragraph 382 *ante*.

It divides the country just described into two main divisions—the larger division containing about ten million acres, being known as the "Mallee country"; and the other containing about one and a half million acres, situated along the southern and eastern borders of the Mallee country, being called the "Mallee border."

392. The Act directs that the "Mallee country" be divided into blocks of various sizes, each block to be subdivided into two parts. For either of these, at the option of the applicant, a lease may be granted under certain conditions, the lessee being also bound to occupy the other division. The principal conditions are that the lessee destroy all vermin (native dogs, rabbits, etc.) upon the whole block within the first three years, surrender to the Crown the unleased portion at the end of five years, and keep in good condition and repair all improvements made upon the land. A lease for a Mallee block may be granted for any term of years not longer than 20 from the commencement of the Act of 1883, at the end of which term (viz., on the 1st December, 1903) the land, with all improvements, reverts to the Crown. Every person who had occupied under pastoral or grazing licence any portion of the Mallee country for two years prior to the 1st December, 1883, was entitled to take up one Mallee block comprising the whole or any portion of the area occupied by him; but, in the event of his not applying for this privilege within one month of the passing of the Act, the right of lease was to be sold by auction to the highest bidder. The annual rent to be charged for the leased portion of the block is fixed at 2d. for each sheep or 1s. for each head of cattle depastured during the first five years, 4d. for each sheep or 2s. for each head of cattle during the second five years, and 6d. for each sheep or 3s. for each head of cattle during the remainder of the term; and for the unleased portion of the block 2d. for each sheep or 1s. for each head of cattle; but in no case is the annual rent for the whole block to be less than 2s. 6d. per square mile. Any Mallee block may be divided into allotments and occupied as Mallee allotments as described in the next paragraph, provided that applications have been received for all the allotments into which the block may be divided. No lessee of a Mallee block can acquire any portion thereof in fee-simple.

Mallee blocks.

393. The "Mallee border" is subdivided into "Mallee allotments," varying in size but not in any case exceeding 20,000 acres. These are available for lease on the same terms and conditions as in the case of the leased portions of a Mallee block; but the annual rent is fixed by regulations issued by the Governor in Council. It is

Mallee allotments.

also provided that at any time within three years of the passing of *Mallee Act* 1889 (25th November, 1889), a lessee or his assignee of a Mallee allotment might select out of such allotment an area, the total extent of which, together with that of any other land previously selected by him, should not exceed 320 acres; the land so selected to be subject to the same conditions as selections under Part I. of the *Land Act* 1890. In case of this provision being taken advantage of, however, the Crown reserves to itself the right to resume as much of the leased portion as is in excess of 1,000 acres.

Systems of land selection in Australasian colonies.

394. The laws and regulations under which land for agricultural purposes passes from the Crown into the hands of private individuals differ in the various Australasian colonies.* In almost all, however, provision is made for any person of 18 years of age or over,† and not a married woman,‡ desirous of settling on the land to select a certain limited area, and to pay the purchase-money by instalments, the compliance with certain conditions of residence and improvement being also required before the selector becomes entitled to a Crown grant.§ The principal features of this portion of each system, corrected to the middle of 1891, is detailed under nine heads in the following table:—

CONDITIONS OF LAND SELECTION IN AUSTRALASIAN COLONIES, 1890-91.

Conditions of Selections.	Victoria.	New South Wales.	Queensland.		South Australia.	Western Australia.	Tasmania.	New Zealand.
			Homesteads.	Other Selections.				
1. Maximum area allowed Acres	320	640 and 2,560	160	320 to 1,280	..	1,000	320	640 and 2,000
2. Price per acre	£1	£1	2s. 6d.	£1 upwards	‖	10s.	£1	7s. 6d. to £1
3. Time over which purchase may extend .. .. Years	20	33	5	¶	‖	20	14	14
4. Minimum time in which fee-simple may be acquired Years	6	5	5	5	6	5	anytime	6**
5. Annual payment per acre ..	1s.	1s.	6d.	¶	‖	6d.	2s.	6d. to 4s.
6. Value of necessary improvements per acre	20s.	10s.	10s.	Fencing	Fencing.	10s. and Fencing	..	20s.
7. Time allowed for making improvements .. Years	6	5	5	5	5	20	..	6
8. Acres in every 100 to be cultivated	10	..	..	..	..	..	..	20
9. Period of residence necessary§ Years	5	5	5	¶	..	5	14	6**

NOTE.—See also further information in following paragraphs. In New Zealand selections may also be bought outright for cash, or may be taken up on a perpetual lease, with option of purchase, on the same conditions as in the case of deferred payments.

* A complete account of the land system of each colony, as it existed in 1884, was published in an Appendix to the *Victorian Year-Book*, 1884-5.

† In New South Wales persons of 16 years of age may select.

‡ In Tasmania and Western Australia married women, and in New South Wales married women judicially separated and living apart from their husbands, may select land.

§ In all the colonies, as soon as the purchase-money is paid in full, the residence clause is no longer enforced. ‖ See account of South Australian land system, following paragraph 398 *post*.

¶ See paragraph 397 *post*.

** In New Zealand, the fee simple may be acquired, and residence may be dispensed with, on double the quantity of improvements being effected.

Land system of Victoria.

395. In Victoria the land is taken up in the first instance in blocks not exceeding 1,000 acres, under lease, at a rental of from 2d. to 4d. per acre, out of which leasehold a "selection," not exceeding 320 acres, may be taken up under the conditions named in the preceding table.* See also paragraphs 385 to 387 *ante.*

Land system of New South Wales.

396. In New South Wales a territorial division of the colony is made into three zones, viz., the eastern, the central, and the western division. The maximum area allowed in the eastern division is 640, and in the central 2,560 acres. In addition to the selection, a leasehold of an additional area, limited to three times that of the selection (the area of the selection and lease together not to exceed 1,280 acres in the eastern, or 2,560 acres in the central division), may be granted to the selector at an appraised annual rental,† with the right of conditional purchase at any time during the currency of the lease. The price per acre does not include interest, for which 4 per cent. per annum is charged and collected out of the annual instalments paid. The first payment is 2s. per acre in advance, with an interval of 3 years before the next instalment of 1s. is payable. On non-residential land purchases the deposit is 4s. per acre, and the instalments 2s. per acre. Upon certain lands proclaimed "special areas," higher prices are payable, and the deposits and instalments are increased in proportion varying in different cases. Persons of 16 years of age, and married women judicially separated and living apart from their husbands, may select.

Land system of Queensland.

397. In Queensland, within the limits named in the table, the maximum area allowed to be selected may be varied in any district by the Government. In that colony the system of leasing has partly supplanted that of alienating the fee-simple of the land by means of deferred payments. The selector first occupies the land under licence, at an annual rental of not less than 3d. per acre, and subsequently, if the condition as to fencing (or improvements of equal value) has been complied with, may obtain a lease for 50 years; the annual rental for the first 10 years being not less than 3d. per acre, but for every succeeding period of 5 years to be fixed by the Land Board. The selector has the right to purchase at not less than 20s. per acre, at any time during the currency of the lease on proving personal residence for 5 years. Rents paid during periods of personal occupation are reckoned as purchase-money. The foregoing remarks relate

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* The law relating to selections was altered in some important respects whilst these pages were passing through the press. See footnote (‡) on page 239 *ante.*

† Formerly there was a minimum rental of 2d. per acre, but this has been altered, the rent now being determined by the Local Land Board, subject to appeal to the Land Court.

to agricultural farms; in the case of grazing farms, leases of areas up to 20,000 acres are granted for 30 years at a minimum rental of ¾d. per acre per annum for the first 10 years, but liable to be increased every subsequent 5 years.

Land system of South Australia.

398. In South Australia credit selection was abolished by the *Crown Lands Act* 1888, and in lieu thereof "leases with right to purchase" are now issued for periods of 21 years at certain gazetted rentals, with right of renewal for a further period of 21 years at freshly assessed rentals. The right to purchase may be exercised at any time after the first six years, at a price fixed by the Land Board of not less than 5s. per acre. The following account of the new system has been kindly furnished for this work by Mr. G. S. Wright, Secretary for Crown Lands, South Australia:—

Land System of South Australia.

On the passing of the *Crown Lands Act* of 1888, the system of credit selection was abolished, and the following mode of obtaining land introduced. Crown lands can be taken up on leases with right of purchase, or perpetual leases. Small blocks not exceeding 20 acres in area, for working men, are also taken up on leases with right of purchase, or on perpetual leases. The province has been divided into five land districts, and a Land Board appointed for each, by which the lands are classified and allotted, and the rents and prices fixed, subject to the approval of the Commissioner of Crown Lands. Lands are gazetted open to lease at rents and prices fixed, and applications for same, accompanied by a deposit of 20 per cent. of the first year's rent, are made to the Commissioner, who refers them to the Land Boards for the districts in which the lands applied for are situated. Upon the successful applicants receiving their leases for signature, they are to forward the balance of the first year's rent and the lease fees to the Land Office. Leases with a right of purchase are allotted for a term of 21 years, with a right of renewal for a further term of 21 years, and with a right of purchase exercisable at any time after the first 6 years of the term, at the price fixed by the Land Board, the minimum price being five shillings per acre. The annual rent for the first term of 21 years is as gazetted, and the annual rent for the renewed term will be fixed by the Land Board at least twelve months before the expiration of the first term. Perpetual leases will be revalued every 14 years. The rent for the first 14 years is as gazetted, and for subsequent terms of 14 years will be fixed by the Land Board at least twelve months before the expiration of every period of 14 years. The lands allotted are to be fenced within 5 years from the date of lease, and in the case of working men's blocks the condition of personal residence by the lessee, or any member of his family, is enforced.

Land system of Western Australia.

399. In Western Australia, the particulars given in the table relate to the South-Western (or Home) District only. In the five other land divisions of the colony, land may be taken up in specially declared areas only by selectors, who need not reside upon the land, in areas of from 100 to 5,000 acres at not less than 10s. per acre, payable in 10 yearly instalments, the conditions required being fencing and the expenditure on improvements of an amount equal to purchase-money. Besides selections under the system of deferred payments, with residence, in the south-west divisions selections may

be made, without residence, by paying double the amount of purchase-money, *i.e.*, 1s. per acre per annum—the other conditions remaining the same; and there is also a method of selecting land by direct payment under certain conditions, the extent of a selection being limited to 1,000 acres in a declared area, and to 5,000 acres outside such area, at a price of not less than 10s. per acre—the conditions being fencing within 3 years, and an expenditure of 5s. per acre on improvements within 7 years from date of survey. Moreover, pastoral lessees, excepting those in the eastern division, have the privilege of selecting a certain proportion of their leasehold adjoining the homestead prior to the 1st March, 1892, under similar conditions, except in regard to residence, as in the case of other selectors in the respective districts; thus, in the south-western division, the proportion allowed to be selected is 5 per cent. with a maximum of 3,000 acres, and in the other divisions, excepting the eastern, 1 per cent. with a maximum of 5,000 acres; provided, also in the latter case, the runs are stocked with 10 sheep or 1 head of large stock to every 1,000 acres leased.

Land system of Tasmania.

400. In Tasmania, $33\frac{1}{3}$ per cent. is added to the price named in the table (£1 per acre) as interest for the period of 14 years. In mining districts in Tasmania selection is allowed in lots ranging from 10 to 100 acres, the price being £1 per acre, with one-fourth in addition added for credit for a term of 7 years. Residence and improvement is compulsory, and fee-simple cannot be obtained until the expiration of seven years. These lots are sold, reserving to the Crown the right of mining at a distance of not less than 50 feet from the surface. In 1890, a Land Act was passed consolidating the twelve Acts previously in operation.

Land system of New Zealand

401. In New Zealand, the price per acre varies with the quality of the land, from 5s. an acre to about 40s. The distinguishing features of the land laws at present are, that blocks of land are declared open for selection either before or after survey on the "optional system," which means that the selector can take up a section not exceeding 640 acres of first class or 2,000 acres of second class land, on cash payment, deferred payment spread over 14 years, or on perpetual lease for a term of 30 years, with right of renewal for other terms of 21 years at a rental of 5 per cent. on the upset cash price. Deferred payment lands are sold at 25 per cent. advance on cash prices. The freehold of either deferred payment or perpetual lease may be obtained at any time, if not within a goldfield, so soon as the

conditions of cultivation have been complied with. Nearly all Crown lands are dealt with under this system now, but a bill is before Parliament which, if passed, will take away the right of purchase in perpetual lease, though leaving the optional system still in force. Residence is compulsory on deferred payment or perpetual lease, unless in bush lands, where it may be dispensed with if twice the amount of improvements are made.

Ambiguity of the term "alienation," as applied to Crown lands

402. In dealing with the figures relating to the alienation of the public estate, it is customary in Victoria to consider Crown lands as sold or alienated—only when the right to the title in fee-simple has been acquired. Consequently a large proportion of the land set down as alienated in any year, having been originally selected with right of purchase under certain conditions, the purchase-money being payable by annual instalments without interest, may have been virtually parted with many years previously. The land set down as alienated in any year, therefore, consists of the area sold by auction, that granted without purchase, and that selected or conditionally purchased—of which the purchase had been completed during the year. Some of the neighbouring colonies, however, adopt a different principle, for, in their statements of land alienated, that sold conditionally—which, of course, is liable to revert to the Crown should the conditions of sale not be complied with—is included with that of which the fee-simple has been obtained. Both methods are useful in their way, the Victorian plan giving the more accurate account of the present condition of the public estate, and the other giving the better indication of the progress of settlement. In the following paragraphs it may perhaps be sometimes necessary to use the term "alienated" in connection with land which is only conditionally purchased, but, when this occurs, such explanation will be given as will prevent a mistake.

Crown lands alienated to end of 1890.

403. The total extent of Crown lands sold and finally parted with in Victoria up to the end of 1890 was 16,076,720 acres, and the extent granted without purchase was 15,160 acres. The whole area alienated in fee-simple was thus 16,091,880 acres, of which 6,628,159 acres, or 41 per cent., were sold by auction, and nearly the whole of the remainder was originally acquired by selection under the system of deferred payments.

Crown lands selected.

404. The selected lands, of which the purchase had not been completed up to the end of the year, amounted to 10,430,182 acres. Of this extent it is estimated that 4,163,008 acres had been forfeited or abandoned, and had reverted to the Crown. The remainder,

representing approximately the whole area in process of alienation under deferred payments, amounted to 6,267,174 acres.

Crown lands unalienated.

405. The total area of the colony is 56,245,760 acres; and if from this be deducted the sum of the land granted, sold, and selected, amounting—less the extent forfeited—to 22,359,054 acres, it will follow that the residue, representing the Crown lands neither alienated nor in process of alienation, amounted at the end of 1890 to 33,886,706 acres.

Public estate, 1890.

406. The whole of this residue, however, is not available for settlement, for it embraces lands occupied by roads, the unsold portions of the sites of towns, and beds of rivers and lakes; the State forests; water, timber, education, and other reserves. Deducting these lands—amounting in the aggregate to 7,679,438 acres, also that portion of the colony known as the Mallee country, containing 11,572,000 acres, leased for pastoral purposes under special provisions of the Act, and 6,644,118 acres occupied under lease or licence for various terms of years—from the extent unalienated and unselected, already stated to have been 33,886,706 acres, it will be found that the available area is narrowed to 7,991,150 acres. This will be at once seen by the following table, which shows the position of the public estate at the end of 1890:—

PUBLIC ESTATE OF VICTORIA ON 31ST DECEMBER, 1890.

Condition of Land.	Approximate Number of Acres.
Land alienated in fee-simple	16,091,880
Land in process of alienation under deferred payments ..	6,267,174
Roads in connexion with the above	1,327,000*
Water reserves	288,530
Reserves for agricultural colleges and experimental farms ...	137,013†
Timber reserves and State forests	2,079,550
Other reserves	2,127,030‡
Unsold land in towns, beds of rivers, etc., etc.	1,720,315
Mallee country	11,572,000§
Land in occupation under—	
Pastoral leases	1,490,812
Grazing area leases	4,719,624
Grazing licences for auriferous lands	432,439
Swamp leases	1,243
Available for occupation at end of 1890	7,991,150‖
Total area of Victoria	56,245,760

* Calculated at 5 per cent. of the gross extent sold and selected up to the end of 1890.

† Only 13,393 acres of this area is for the sites of colleges and experimental farms, the balance being intended as an endowment in aid. Of this balance 125,226 acres was leased for agricultural and grazing purposes, and return an annual revenue of £6,312.

‡ Including 1,907,400 acres reserved in 1889 as an endowment for State education.

§ Occupied for pastoral purposes, under Part II. of the *Land Act* 1890, for terms not exceeding 20 years. See paragraph 426 *post*. It has recently been thrown open to selection.

‖ Of this area 5,033,921 acres is temporarily held under grazing licences, renewable annually; only 76,079 acres of it may be sold by auction.

Crown lands available for settlement.

407. The area of the colony, exclusive of the Mallee country, is 44,673,760 acres, of which, at the end of 1890, 22,359,054 acres, or 50 per cent., were already alienated or in process of alienation; 7,679,438 acres, or 17 per cent., were occupied by reserves, etc.; 6,644,118 acres, or 15 per cent., were occupied under lease* for pastoral purposes; and 7,991,150† acres, or 18 per cent., were available for immediate occupation.

Classification of available land.

408. Following the classification provided for under the existing *Land Act*, the estimated available area of Crown lands, exclusive of the Mallee country, at the end of 1890, may be divided as follows:—

CLASSIFICATION OF LAND AVAILABLE FOR SETTLEMENT AT END OF 1890.

	Acres.
Pastoral lands	2,142,658
Agricultural and grazing lands	4,596,727
Auriferous lands	1,089,277
Swamp lands	86,409
May be sold by auction	76,079
Total	7,991,150

Crown lands alienated, 1890.

409. The land finally alienated from the Crown in fee-simple during 1890 amounted to 249,568 acres, of which 249,373 acres were sold, and 195 acres were granted without purchase. The total extent was less by 8,665 acres than in 1889, and was also much smaller than in any of the ten years ended with 1888, during which period the extent alienated annually usually exceeded 400,000 acres, and only once (in 1879) did it fall below 300,000 acres.

Crown lands sold by auction.

410. Of the area sold, 12,201 acres, or 5 per cent., were disposed of by auction, and 682 acres under pre-emptive rights, private contracts, etc., whilst the remainder had been in the first instance selected in previous years under the system of deferred payments. The extent sold by auction in 1890 was 1,479 acres less than in 1889, and from 5,500 to 6,500 acres less than in any of the three preceding years, also much less than in any of the sixteen years ended with 1885, during which period the annual average extent so sold was 63,700 acres, and the maximum over 150,000 acres.

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* Including a small proportion under licence for periods of five years.

† Of this area 5,033,921 acres is temporarily held under grazing licences, renewable annually; only 76,079 acres of it may be sold by auction.

411. The amount realized for Crown lands finally alienated in 1890 was £322,946, or at the rate of £1 5s. 11d.* per acre. Of this sum, only part was received during the year, nearly all the remainder having been paid in former years as rents and licence fees. The proportion sold by auction realized £84,533, or an average of £6 18s. 7d. per acre; and the proportion sold otherwise than at auction realized £238,413, or an average of £1 0s. 1d. per acre.

Amount realized on Crown land alienated in 1890.

412. The principle of deferred payments in connexion with sales of Crown lands by auction was introduced for the first time in the *Land Act* 1884,† it being necessary to pay one-fourth of the price bid at the time of sale, the remaining three-fourths being, at the option of the purchaser, spread over three years, payable quarterly, in instalments of equal amounts, bearing interest at the rate of 6 per cent. per annum. The majority of purchasers do not avail themselves of this concession, as only £114,981, out of a total of £679,992 during the last six years, was left unpaid at the time, the amount received being £565,011, as well as £19,740 for interest.

Deferred payments on land sold by auction.

413. From the period of the first settlement of the colony to the end of 1890 the amount nominally realized by the sale of Crown lands was £24,634,531, or at the rate of £1 10s. 8d. 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 10 years without interest, the amount of purchase-money is really equivalent to only 15s. 6d. per acre, and if it be extended over 20 years, it is reduced to 12s. 6d. per acre.

Amount realized, 1836 to 1890.

414. During the year 1890, 551 applications were granted for the selection of 99,307 acres under the deferred payment system.‡ The whole of this area was selected out of grazing areas leased in allotments limited to 320 acres, nominally for agricultural purposes. The following is a summary of the selectors, the number of acres selected, and the amount of purchase-money payable under each authority during the year 1890:—

Selection of public lands, 1890.

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* In view of the fact that payment for the greater portion extended over a term of years without interest, the actual average price was much less than this. See paragraph 413 *post.*

† 48 Vict. No. 812, Section 71.

‡ See paragraphs 385 and 386 *ante.*

Selectors and Amount Selected, 1890.

Selections of Crown Lands, 1890, for purpose of—	Legalization—*Land Act* 1884.	Number of Selectors.	Area Selected.	Purchase money payable, (Nominal.)
			Acres.	£
Agriculture, with residence	Sec. 42	518	94,898	94,898
" without residence	Sec. 49	33	4,409	8,818
Total	... ...	551	99,307	103,716

Number of selectors, 1870 to 1890.

415. The number of selectors approximates closely to the number of approved applications. The following are the numbers in each of the years named in the last table, those applying according to the different purposes allowed by the Land Act in force at the time of application being distinguished:—

Approved Applications (Selectors), 1870 to 1890.

Year.	Number of Selectors of Land.				
	For Purposes of Cultivation.		For Residence and Cultivation near Goldfields.	For Residence.	Total.
	With Residence.	Without Residence.			
1870	3,017	...	131	...	3,148
1871	4,575	...	673	...	5,248
1872	7,771	...	1,408	...	9,179
1873	6,689	...	1,455	...	8,144
1874	9,578	...	1,493	...	11,071
1875	6,320	...	771	...	7,091
1876	5,785	...	697	...	6,482
1877	6,240	...	777	...	7,017
1878	7,524	...	1,534	...	9,058
1879	5,726	75	887	...	6,688
1880	4,036	67	1,054	56	5,213
1881	3,110	42	1,151	106	4,409
1882	4,383	51	837	47	5,318
1883	4,453	58	1,070	22	5,603
1884	3,918	71	1,002	11	5,002
1885	3,930	68	714	83	4,795*
1886	943	25	173	49	1,190*
1887	147	...	39	15	201
1888	317	...	...	10	327
1889	418	41	...	2	461
1890	518	33	...	...	551
Total ...	89,398	531	15,866	401	106,196

* The great majority of the applications approved in the years 1885 and 1886 were lodged in 1884, under the provisions of the *Land Act* 1869.

416. The extent of Crown lands absolutely or conditionally alienated during each year since the passing of the *Land Act* 1869 is shown in the following table, which distinguishes the extent sold by auction and that granted without purchase from that conditionally alienated or selected:— Progress of settlement on public lands, 1870 to 1890.

Crown Lands Absolutely and Conditionally Alienated, 1870 to 1890.

Year.	Area Granted, Sold, and Selected.			Total.
	Granted without Purchase.	Sold by Auction.*	Conditionally Alienated.† (Selected).	
	Acres.	Acres.	Acres.	Acres.
1870	21	148,685	322,592	471,298
1871	118	118,440	487,436	605,994
1872	320	146,611	797,176	944,107
1873	1,575	19,929	1,063,066	1,084,570
1874	44	49,655	1,831,698	1,881,397
1875	...	83,395	1,183,520	1,266,915
1876	546	150,628	1,040,356	1,191,530
1877	260	76,006	1,126,498	1,202,764
1878	57	47,376	1,415,129	1,462,562
1879	503	56,430	1,032,214	1,089,147
1880	461	27,272	752,639	780,372
1881	3,237	24,753	588,922	616,912
1882	666	31,386	851,402	883,454
1883	159	20,085	843,971	864,215
1884	74	35,446	734,092	769,612
1885	3,099	26,900	723,523	753,522
1886	1,120	19,281	188,196	208,597
1887	487	19,565	23,092	43,144
1888	522	22,413*	53,738	76,673
1889	531	15,639*	71,251	87,421
1890	195	12,883*	99,307	112,385
Total	13,995	1,152,778	15,229,818	16,396,591

417. Dividing the total number of acres selected by the total number of selectors, as shown in the last two tables, it is found that throughout the whole period of twenty-one years the average number of acres taken up by each selector has been 154. Average size of selections.

418. Of the land which had been selected in former years, 20,065 acres during 1890 were abandoned or forfeited to the Crown in consequence of non-fulfilment of conditions. Selected land forfeited, 1890.

* Including 2,389 acres in 1888, 1,959 acres in 1889, and 682 in 1890 sold by private contract.

† A large proportion of the land referred to in this column may revert, and, as a matter of fact, a considerable quantity has reverted, to the Crown in consequence of non-fulfilment of conditions, etc., and may subsequently be included in re-adjustments of selections, re-licensed, sold by auction, or retained by the Crown. "Gold-fields" selections are included in this column. See paragraph 404 *ante*.

Leases of grazing areas, 1890.

419. The *Land Act* 1890 prescribes that any one wishing to select for agricultural purposes must first acquire the lease of a grazing area.* The number of applications for such leases received in 1890 was 4,714; but the number approved during that year was only 1,612, the extent for which approval was granted being 606,185 acres, at an annual rental of £6,314. The applications approved were 736 fewer, and the area granted 319,754 acres less, than in the preceding year.

Selections under the *Lands Acts* 1884 and 1890.

420. The number of lessees of "grazing areas" who made application during the year 1890 for the issue of licences of agricultural allotments (selections) was 661, for an area of 115,876 acres. The number of approved applications, however, was 551, and the area licensed 99,307 acres, as compared with 71,245 acres in 1889. The annual fees, which form part of the purchase-money payable on these selections, amount in the aggregate to £5,186. Of the area licensed in 1890, 4,409 acres, averaging 134 acres in each selection, were granted to non-resident selectors.

Licence liens.

421. Licensees of agricultural allotments (or selectors) under the *Land Act* 1869 and subsequent acts are empowered to register licence liens for advances of money up to half the value of improvements effected. The number of such licence liens registered, the extent of land on which such liens were granted, and the amount secured were as follow in the last five years :—

LICENCE LIENS, 1886 TO 1890.

Year.	Liens Registered.		
	Number.	Area on which Liens were Granted.	Amount Secured.
		Acres.	£
1886	326	79,099	38,924
1887	305	68,968	34,634
1888	405	95,294	48,098
1889	267	58,705	30,039
1890	216	46,467	25,244

Pastoral occupation 1890.

422. Under the present land system, it is intended that the purely pastoral lands of the colony, the whole of which are marked off as "pastoral allotments," should be occupied under lease for periods not exceeding fourteen years from the 29th December,

* See paragraphs 384 and 385 *ante*. This provision was changed whilst these pages were passing through the press. See footnote (‡) on page 239 *ante*.

1884. But it has been provided, in case all the allotments should not be applied for, that temporary grazing licenses, renewable annually, may be granted for the occupation of such lands and of unoccupied agricultural lands, so long as they may not be required for leasing under the principal sections of the Acts 1884 and 1890. Moreover, agricultural lands, which are not occupied for agricultural purposes, are leased in grazing areas as already stated;* auriferous lands, in blocks not exceeding 1,000 acres, may be licensed for grazing purposes for periods of five years; and special provision is made for the occupation of the Mallee country. The following table shows the area of the Crown lands under the *Land Act* 1890 held under lease or license for pastoral or grazing purposes, including Mallee pastoral leases, at the end of 1890, also the number of leases and licenses, and the annual rental payable:—

PASTORAL OCCUPATION, 1890.†

(Under *Land Act* 1890.)

Description of Tenure.	Number of Licences or Leases.	Extent of Crown Lands.	Annual Rental.
		Acres.	£
Pastoral leases (sec. 21)	89	1,490,812	5,216
Grazing area leases (sec. 32) ...	11,816	4,719,624	31,172
Grazing licences (secs. 3 and 123)...	2,813	5,033,921	16,728
„ „ (auriferous lands, secs. 65 and 67)‡	3,220	432,439	6,953
Mallee pastoral leases (Part II.) ...	1,283	9,912,971	7,125
Total	19,221	21,589,767	67,194

Average area of runs and grazing rights.

423. By these figures it may be ascertained that the average extent of land embraced in a pastoral lease was 16,751 acres, in a grazing area lease 399 acres, in a grazing licence (secs. 3 and 123) 1,790 acres, and in a Mallee pastoral lease 7,726 acres. The areas are exclusive of those of any purchased land attached thereto.

Rent of runs and grazing rights.

424. According to the table, the average rent per acre of pastoral allotments was about $3\frac{1}{3}$ farthings; of land held under grazing licence a fraction more than a penny (1·04d.); and of Mallee pastoral lands two-thirds of a farthing (·17d).

* See paragraph 384 *ante*.

† Including Mallee pastoral leases, which are not now dealt with under a separate Act.

‡ Including licences for residences or cultivation limited to 20 acres each. At the end of 1890 the number of these was 2,211, but the area was only 41,301 acres.

Assessment of pastoral lands.

425. The rental of pastoral lands (exclusive of agricultural lands used for pastoral purposes, and of the Mallee pastoral lands) available at the end of 1885, viz., 7,078,100 acres, was assessed in 1886 at £24,717 per annum. Since 1885, however, the area has been considerably reduced, which will naturally reduce the assessment referred to.

Mallee pastoral leases.

426. The Mallee country is divided into blocks and allotments.* The number of leases and of lessees of these, together with their approximate area, and the annual rental payable therefor, are shown in the following table:—

MALLEE PASTORAL LEASES ON 31ST DECEMBER, 1890.

Description of Leaseholds.	Number of Leases.	Number of Lessees.	Area.	Annual Rental.†
			Acres.	£
Mallee blocks	66	45	7,259,018	3,400
,, allotments	1,217	1,217	2,653,953	3,725
Total	1,283	1,262	9,912,971	7,125

Surrender and re-leasing of Mallee blocks.

427. On the 1st January, 1889, the occupied portions of most of the Mallee blocks were surrendered to the Crown.‡ The greater number of these were re-leased for the remainder of the term allowed under the Act, which expires on the 1st December, 1903, but some were subdivided into allotments and made available for selection with others which were subsequently surrendered. In all 17 blocks have thus been subdivided into 770 allotments, each having an area of about 640 acres. Not only will the revenue be very substantially increased by this means (as the annual rental will range from £2 to £4 for each allotment), but the settlement of the country will much more rapidly progress and the destruction of vermin be more effectual than was possible when it was, as previously, held under ten leases, and was practically unsettled.

Mallee areas still unoccupied, 1890.

428. At the end of 1890 the following areas were still available for occupation in the Mallee country:—Mallee blocks, 1,511,040 acres; Mallee allotments, 147,984 acres.

Past and present occupation of Mallee country.

429. In 1883, prior to the passing of the *Mallee Pastoral Leases Act*, the Mallee country was held under pastoral licences or grazing rights. The number of such licences and rights was 147, held by 58 individual occupiers; the area over which the right of occupation was given was 7,727,360 acres, and the annual rental payable was £8,076.

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* See paragraphs 391 to 393 *ante*. † Approximate only. ‡ See paragraph 392 *ante*.

From a comparison of these figures with those in the above table, it appears that since 1883, whilst the occupiers of the Mallee country have increased twenty-two times, and the extent occupied by nearly one-third, the annual rental has fallen off by £951, or by 12 per cent. As a set-off against this reduced rental, however, it should be pointed out that the present lessees have to comply with certain conditions* to which the licensees under the former Act were not subject.†

Average rental of Mallee country.

430. According to the figures in the last table, the average rental per 100 acres payable for the Mallee country is 1s. 5¼d., or 11d. for the Mallee blocks, and 2s. 9½d. for the Mallee allotments. In 1883, prior to passing of the first Mallee Act, the average rental in the Mallee country was 2s. 1d. per 100 acres.

Land revenue.

431. The revenue from the sale and occupation of Crown lands may be divided into—(1) receipts from the alienation of lands in fee-simple, including the price realized from land sales and from rents which count towards the purchase-money; (2) receipts on account of temporary occupation, which include payment for pastoral leases and grazing licences, rents for business, factory, and hotel sites, etc., and rents of land which do not count towards the purchase-money; (3) penalties, interest and fees for grants, leases, licences, etc. The gross receipts show an increase of about £7,300 as compared with the previous year, as will be seen by the following figures :—

LAND REVENUE, 1889 AND 1890.

Heads of Land Revenue.	Amounts Received.		Increase (+). Decrease (−).
	1889.	1890.	
	£	£	£
Alienation in fee-simple and progressive ...	461,009	449,744	−11,265
Temporary occupation	97,911	117,088	+19,177
Penalties, fees, etc.	32,846	32,221	−625
Total	591,766	599,053	+7,287‡

Agricultural statistics.

432. The agricultural statistics of Victoria are collected by the municipal bodies, which, under the *Local Government Act* 1874 (38 Vict. No. 506), and the *Local Government Act Amendment Act* 1883 (47 Vict. No. 786), are required each year to furnish to the Government Statist, on or before the 1st March, such agricultural

* See paragraph 392 *ante*.
† Mallee lands may now be selected. See paragraph 393 *ante*.
‡ Net figures.

and other statistics relating to their districts on such forms and in such manner as the Governor in Council may direct. All persons are required to give correct information to the best of their knowledge and belief; and, should they fail to do so, they render themselves liable to a penalty not exceeding £10. Collectors divulging or making extracts from the information they receive, except under the special direction or authority of the Government Statist, also render themselves liable to a penalty of £10.

Bonuses for collecting statistics.

433. In assigning the duty of collecting statistics to the local bodies, the law did not provide that they should receive any payment therefor; and thus, although under the provision of the Act whereby the Governor in Council had power to prescribe the manner as well as the form of the statistics, elaborate instructions for the guidance of the persons employed had each year been supplied them, the Government had practically but little control over the work, and hence many of the returns were not sent in until long after the appointed time, and some were generally furnished in anything but a satisfactory condition. This being the case it was decided by the Government—for the first time in 1883-4—to offer bonuses, ranging, according to the nature of the country, from £6 to £3 per 100 schedules collected, to such municipalities as should furnish authentic and complete returns punctually at the appointed time—the amount to be reduced one-half if the returns were delayed for five days, three-quarters if they were delayed for ten days, and forfeited altogether if ten days should be exceeded. These bonuses have now been given for eight years with excellent effect, as the measures taken have resulted in the statistics being sent in at such a date that it has become possible to publish nearly complete returns fully two months earlier than such a result had been achieved in previous years.

Agricultural statistics, 1890-91.

434. The agricultural statistics to which reference will now be made are those for the year ended 1st March, 1891.* Tables embodying the final results of these statistics will be found in the *Government Gazette* of the 14th September last,† and these, with additional tables, form portion of the *Statistical Register of Victoria.*

Number of cultivators.

435. The total number of farm holdings visited in the year under notice was 36,013, of which 35,066 were in shires, and 947 in cities,

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* A summary of the agricultural statistics of each year, since the first settlement of the colony, is published at the commencement of this volume (second folding sheet).

† This year tables containing a statement of the extent of land under crop, and yield of wheat, oats, potatoes and hay, were published in the Melbourne daily journals of the 4th April.

towns, or boroughs. In the previous year the number of farms visited was 36,497, there being thus a decrease of 484.

436. The extent of land returned as under cultivation amounted to 2,652,768 acres, as against 2,627,262 acres in 1889-90. The increase shown by the figures was, therefore, 25,506 acres. Land under tillage.

437. The average area returned as in cultivation to each person in the colony was $2\frac{1}{3}$ acres in the year under review as against nearly $2\frac{1}{2}$ acres five years previously, and $2\frac{1}{3}$ acres ten years previously. The exact proportions at the three periods were as follow :— Area cultivated per head of population.

AVERAGE AREA CULTIVATED TO EACH PERSON IN THE COLONY.

	Acres.
1880-81	2·32
1885-6	2·48
1890-91	2·34

438. The following table shows the area per head cultivated in each Australasian colony during the nine seasons ended with that of 1889-90, also the mean of those seasons, the colonies being placed in order according to the average extent of land per head that each cultivates :— Area cultivated per head in Australasian colonies.

CULTIVATION PER HEAD IN AUSTRALIAN COLONIES, 1882 TO 1890.*

Colony.	Acres under Tillage per Head of Population.									
	1881-2.	1882-3.	1883-4.	1884-5.	1885-6.	1886-7.	1887-8.	1888-9.	1889-90.	Mean.
1. S. Australia† ...	8·91	8·08	9·05	8·91	...	...	...	...	9·05	8·80
2. Tasmania ...	3·15	3·08	3·12	3·26	3·12	3·25	3·21	3·29	3·30	3·20
3. New Zealand...	2·63	2·68	2·61	2·39	2·20	2·33	2·39	2·41	2·52	2·46
4. Victoria ...	2·06	2·25	2·38	2·42	2·42	2·41	2·49	2·35	2·35	2·34
5. W. Australia...	1·78	1·84	1·94	2·42	2·19	2·18	2·49	2·52	2·47	2·20
6. N. S. Wales ...	·83	·90	·91	·92	·90	1·02	1·01	·92	1·05	·94
7. Queensland ...	·56	·64	·58	·64	·66	·65	·56	·55	·65	·61

439. It will be observed that South Australia cultivates much more, and New South Wales and Queensland cultivate much less, per head than any of the other colonies ; also that over a series of years Results in different colonies compared.

* For the population and number of acres under tillage in each Australasian colony during the eighteen years ended with 1890-91, see Summary of Australasian Statistics (third folding sheet) *ante;* also Appendix A. *post.*

† The colony of South Australia did not collect agricultural statistics in the four years ended with 1888-9 ; the mean is, therefore, for five years.

Victoria has in this respect occupied a middle place, being below South Australia, Tasmania, and New Zealand, but above the other three colonies, viz., Western Australia, New South Wales, and Queensland. In the four years ended with 1887-8, however, Victoria, in proportion to population, had more land in cultivation than New Zealand.

Land under principal crops.

440. The principal crops grown in Victoria are wheat, oats, barley, potatoes, hay, and green forage. In 1890-91 the area under wheat was less by 33,600 acres than in 1889-90, also less by 72,000 and 88,000 acres respectively than in 1888-9 and 1887-8, but was larger than in any previous year; the area under oats was smaller by 15,000 acres, and that under barley smaller by 3,000 acres, than in 1889-90, but both were larger than in any previous year; the area under potatoes, although larger than in 1889-90 by 6,700 acres, was exceeded in 1887-8 and in 1886-7; that under hay was smaller by 38,000 acres than that in 1889-90, and also smaller than in any previous year since 1884-5, except 1888-9; the area returned under green forage, although larger by 90,000 acres than that in 1889-90, and also considerably larger than in 1888-9 and 1887-8, was below the area returned for 1886-7 by nearly 40,000 acres, and by more than that extent when compared with other previous years. The large falling-off since 1886-7 in the last-named item is accounted for by the fact that in the last four years the collectors have been instructed not to visit holdings on which there was no other cultivated land than that laid down under permanent artificial grass, which is included under the head of green forage. The following table shows the extent of land under each of these crops in the last two seasons :—

LAND UNDER PRINCIPAL CROPS, 1890 AND 1891.

Year ended March.	Wheat.	Oats.	Barley.	Potatoes.	Hay.	Green Forage.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1890 ...	1,178,735	236,496	90,724	47,139	451,546	155,596
1891 ...	1,145,163	221,048	87,751	53,818	413,052	245,332
Increase ...	...	...	...	6,679	...	89,736
Decrease ...	33,572	15,448	2,973	...	38,494	...

Produce of principal crops.

441. The last two seasons—1889-90 and 1890-91—were both fairly productive. In the latter, the gross yields of wheat and potatoes were larger than in the former one by $1\frac{1}{4}$ million bushels

and 47,000 tons respectively; but the yields of oats and barley were smaller by 725,000 and 260,000 bushels, whilst the crop of hay was less by nearly 100,000 tons. The wheat crop in 1890-91—12,751,000 bushels—was the third largest ever raised in the colony; still it was 2,800,000 bushels below the crop produced in 1883-4. The gross yield of oats and barley was exceeded only in 1889-90, that of potatoes was by far the largest ever produced, whilst that of hay was exceeded in only two previous seasons. The following is a statement of the gross produce of each of the principal crops in 1889-90 and 1890-91 :—

GROSS PRODUCE OF PRINCIPAL CROPS, 1890 AND 1891.

Year ended March.	Wheat.	Oats.	Barley.	Potatoes.	Hay.
	Bushels.	Bushels.	Bushels.	Tons.	Tons
1890 ...	11,495,720	5,644,867	1,831,132	157,104	666,385
1891 ...	12,751,295	4,919,325	1,571,599	204,155	567,779
Increase ...	1,255,575	...	...	47,051	...
Decrease ...	...	725,542	259,533	...	98,606

442. The following table shows the area under and gross produce of wheat in each county during the year ended 1st March, 1891, also the average produce of wheat per acre in each county during that and the preceding year :— Area under and produce of wheat.

WHEAT IN EACH COUNTY.—AREA UNDER CROP AND GROSS AND AVERAGE PRODUCE.

Counties.	Year 1890-91.		Average Produce per Acre.	
	Area under Crop.	Gross Produce.	1890-91.	1889-90.
	Acres.	Bushels.	Bushels.	Bushels.
Anglesey	492	5,901	11·99	11·35
Benambra	976	21,000	21·52	14·81
Bendigo	52,493	721,334	13·74	14·15
Bogong	23,426	301,476	12·87	6·59
Borung	301,400	3,168,538	10·51	10·23
Bourke	535	10,031	18·74	11·38
Buln Buln	145	3,267	22·53	18·11
Croajingolong ...	18	275	15·28	17·65
Dalhousie	1,664	27,874	16·74	12·62
Dargo	114	352	3·08	6·59
Delatite	6,776	95,040	14·03	8·73

Wheat in Each County.—Area under Crop and Gross and Average Produce—*continued.*

Counties.	Year 1890-91.		Average Produce per Acre.	
	Area under Crop.	Gross Produce.	1890-91.	1889-90.
	Acres.	Bushels.	Bushels.	Bushels.
Dundas	6,812	88,555	13·00	9·92
Evelyn	19	333	17·53	13·70
Follett	1,424	16,278	11·43	10·32
Gladstone	59,226	679,525	11·47	10·20
Grant	1,240	26,845	21·65	15·54
Grenville	547	7,552	13·81	14·71
Gunbower	36,942	387,880	10·50	11·76
Hampden	224	4,369	19·50	15·78
Heytesbury	202	5,296	26·22	16·85
Kara Kara	107,069	1,151,202	10·75	9·57
Karkarooc	23,137	289,327	12·50	10·64
Lowan	224,425	1,767,865	7·88	6·33
Moira	192,057	2,655,572	13·83	9·09
Mornington	62	857	13·82	16·00
Normanby	2,222	28,412	12·79	12·21
Polwarth	127	1,674	13·18	29·02
Ripon	3,418	58,061	16·99	15·73
Rodney	60,093	753,032	12·53	12·02
Talbot	4,082	71,088	17·41	12·45
Tambo	23	630	27·39	24·88
Tanjil	1,095	22,845	20·86	15·32
Tatchera	31,017	343,779	11·08	11·10
Villiers	1,659	35,150	21·19	17·21
Wonnangatta ...	2	80	40·00	12·57
Total	1,145,163	12,751,295	11·13	9·75

Wheat-yield in ten counties 1889-90 and 1890-91 compared.

443. A reference to the table will show that nearly twelve million out of the twelve and three-quarter million bushels of wheat raised in Victoria in the year under notice were raised in ten counties, which, for the most part, lie between the 36th and 37th parallels of south latitude, and which have been mentioned in previous issues of this work as, above all others, the wheat producing counties of Victoria. It will be noticed that the largest increase—nearly 1,000,000 bushels—was in Moira, and the next largest in Lowan; also that in as many as five of the counties there was a decrease amounting to nearly 600,000 bushels, the falling-off in two cases, however, being due to a smaller area being placed under wheat. In the following table these counties are arranged in order, according to the yield of wheat

in 1890-91; the increase or falling-off, as compared with the previous year, being also shown :—

Yield in Ten Wheat Producing Counties, 1890 and 1891.

Counties.	Bushels of Wheat Produced.		
	1889-90.	1890-91.	Increase + Decrease −
Borung	3,122,711	3,168,538	+45,827
Moira	1,673,578	2,655,572	+981,994
Lowan...	1,312,320	1,767,865	+455,545
Kara Kara	1,066,397	1,151,202	+84,805
Rodney	853,939	753,032	−100,907
Bendigo	867,758	721,334	−146,424
Gladstone	730,594	679,525	−51,069
Gunbower	581,119	387,880	−193,239
Tatchera	424,921	343,779	−81,142
Bogong	112,098	301,476	+189,378
Total	10,745,435	11,930,203	+1,184,768*

Acreable yield of wheat.

444. As regards the acreable yield of wheat, it will be noticed that in 1890-91, taking the colony as a whole, it was $1\frac{1}{3}$ bushel higher than in 1889-90. In 8 of the 35 counties, however, the yield per acre was less in 1890-91 than in the previous year, viz. :—Bendigo, Croajingolong, Dargo, Grenville, Gunbower, Mornington, Polwarth, and Tatchera; but with the exception of Bendigo, Gunbower, and Tatchera, only a very small quantity of the wheat grown in Victoria is obtained from these counties.

Small gross yield of wheat in some counties.

445. It will be observed that in several of the countries in which the average yield of wheat is high a very small quantity is grown, which is probably raised on a patch of choice land, and does not afford an indication of the general productiveness of the county. Thus in 1890-91 only 2 acres were placed under wheat in Wonnangatta, 19 in Evelyn, 23 in Tambo, 145 in Buln Buln, and 202 in Heytesbury; and in all these counties the yield per acre was much above the average of the colony.

* Net increase.

Area under other principal crops in each county.

446. The following table gives a statement of the number of acres under oats, barley, potatoes, and hay, in each county during 1890-91 :—

Oats, Barley, Potatoes and Hay in each County.
Area under Crop.

Counties.	Area under Crop, 1890-91.			
	Oats.	Barley.	Potatoes.	Hay.
	Acres.	Acres.	Acres.	Acres.
Anglesey	1,461	172	345	2,114
Benambra	2,029	10	272	2,043
Bendigo	18,058	1,657	19	26,481
Bogong	8,243	404	630	11,312
Borung	4,292	1,252	49	38,606
Bourke	7,133	1,890	6,673	27,896
Buln Buln	2,738	192	3,174	5,095
Croajingolong	128	3	85	273
Dalhousie	14,984	510	4,658	10,721
Dargo	77	99	220	880
Delatite	10,019	193	1,205	6,920
Dundas	3,238	421	110	3,770
Evelyn	402	11	843	4,173
Follett	1,523	151	88	879
Gladstone	16,180	1,715	4	19,247
Grant	8,784	1,867	7,858	29,781
Grenville	5,767	2,184	875	11,918
Gunbower	6,182	2,090	5	12,649
Hampden	888	862	852	3,329
Heytesbury	1,948	327	1,151	2,161
Kara Kara	12,500	1,051	111	24,627
Karkarooc	104	61	4	2,128
Lowan	4,829	1,136	25	30,913
Moira	26,931	48,670	20	31,481
Mornington	581	37	919	4,969
Normanby	3,195	415	744	5,033
Polwarth	1,579	1,688	3,114	3,788
Ripon	9,672	155	1,272	14,157
Rodney	16,492	10,622	1	15,973
Talbot	20,981	1,120	8,271	43,142
Tambo	72	9	153	462
Tanjil	3,421	1,901	1,085	4,324
Tatchera	859	723	12	5,065
Villiers	5,183	4,151	8,765	6,241
Wonnangatta	575	2	206	501
Total	221,048	87,751	53,818	413,052

Gross produce of other principal crops in each county.

447. By the next table, which shows the gross produce of oats, barley, potatoes, and hay in each county, it will be seen that in 1890-91 most oats was grown in Talbot, Moira, and Bendigo, in the order

named; more than half the barley in Moira; most potatoes in Villiers, Grant, Bourke, and Talbot; and most hay in Talbot, Grant, Bourke, Borung, Moira, and Bendigo:—

GROSS PRODUCE OF OATS, BARLEY, POTATOES, AND HAY, IN EACH COUNTY, 1890-91.

Counties.	Gross Produce, 1890-91.			
	Oats.	Barley.	Potatoes.	Hay.
	Bushels.	Bushels.	Tons.	Tons.
Anglesey	30,697	2,455	1,152	3,337
Benambra	64,008	272	1,239	3,265
Bendigo	429,353	30,853	50	30,484
Bogong	172,687	8,071	2,300	13,385
Borung	68,397	13,718	77	42,304
Bourke	198,037	55,615	23,825	48,275
Buln Buln ...	70,819	4,702	16,322	9,925
Croajingolong ...	3,158	55	378	447
Dalhousie	337,011	9,656	10,958	15,918
Dargo	2,535	3,330	1,209	1,741
Delatite	217,530	3,855	4,771	8,584
Dundas	60,708	7,382	331	5,980
Evelyn	8,856	205	3,290	6,817
Follett	28,930	2,289	217	1,237
Gladstone	356,081	24,770	2	21,264
Grant	280,430	53,524	26,444	54,795
Grenville	141,779	57,210	2,062	19,748
Gunbower	150.137	27,808	...	11,164
Hampden	18,558	15,670	4,517	6,856
Heytesbury ...	40,618	6,125	4,585	3,481
Kara Kara ...	213,413	14,402	213	25,893
Karkarooc ...	2,380	786	8	2,376
Lowan	64,104	9,668	38	24,461
Moira	540,615	796,358	22	33,106
Mornington ...	15,281	645	4,888	8,184
Normanby ...	53,383	6,899	2,597	7,627
Polwarth	31,913	38,747	15,332	7,317
Ripon	232,255	3,697	2,708	27,329
Rodney	268,504	169,837	1	16,592
Talbot	626,591	28,891	22,269	78,333
Tambo	1,945	240	909	889
Tanjil	65,112	62,305	4,650	7,687
Tatchera	14,783	8,569	10	5,035
Villiers	97,530	102,950	46,015	13,081
Wonnangatta ...	11,187	40	766	862
Total ...	4,919,325	1,571,599	204,155	567,779

448. The average produce per acre of oats, barley, potatoes, and hay in each county during the last two seasons is given in the following table:— Average yield of other principal crops in each county.

Average Produce of Oats, Barley, Potatoes, and Hay in each County, 1889-90 and 1890-91.

Counties.	Average Produce per Acre of—							
	Oats. (Bushels.)		Barley. (Bushels.)		Potatoes. (Tons.)		Hay. (Tons.)	
	1889-90.	1890-91.	1889-90.	1890-91.	1889-90.	1890-91.	1889-90.	1890-91.
Anglesey ...	18·68	21·00	17·03	14·27	2·56	3·34	1·54	1·58
Benambra ...	31·05	31·54	22·32	27·20	3·87	4·56	1·48	1·60
Bendigo ...	29·90	23·78	22·62	18·62	2·43	2·63	1·48	1·15
Bogong ...	14·57	20·94	13·32	19·98	2·41	3·65	·90	1·18
Borung ...	21·26	15·93	16·40	10·96	3·48	1·57	1·23	1·10
Bourke ...	24·57	27·76	26·17	29·43	3·57	3·57	1·97	1·73
Buln Buln ...	27·38	25·86	27·94	24·49	4·87	5·14	1·93	1·95
Croajingolong	29·90	24·67	34·00	18·33	3·66	4·45	1·49	1·64
Dalhousie ...	21·48	22·49	23·08	18·93	2·23	2·35	1·48	1·49
Dargo ...	25·88	32·92	26·16	33·64	4·03	5·49	2·09	1·98
Delatite ...	16·82	21·73	15·92	19·97	2·09	3·97	1·08	1·24
Dundas ...	20·16	18·75	21·33	17·53	2·39	3·00	1·58	1·59
Evelyn ...	20·88	22·03	12·34	18·64	3·63	3·90	1·70	1·63
Follett ...	23·28	19·00	24·54	15·16	2·79	2·47	1·57	1·41
Gladstone ...	25·09	22·01	18·17	14·44	2·69	·50	1·36	1·10
Grant ...	29·22	31·93	32·92	28·67	3·04	3·37	2·08	1·84
Grenville ...	28·99	24·58	36·67	26·20	2·22	2·36	1·76	1·66
Gunbower ...	30·71	24·29	20·18	13·25	2·00	...	1·45	·88
Hampden ...	25·84	20·90	35·20	18·18	4·06	5·30	1·90	2·06
Heytesbury ...	23·44	20·85	37·13	18·73	3·32	3·98	1·72	1·61
Kara Kara ...	19·28	17·07	13·88	13·70	1·73	1·92	1·26	1·05
Karkarooc ...	15·67	22·88	19·80	12·89	5·00	2·00	1·81	1·12
Lowan ...	15·76	13·28	8·62	8·51	3·08	1·52	·86	·79
Moira ...	19·71	20·07	14·83	16·36	1·08	1·10	1·14	1·05
Mornington	23·90	26·30	18·51	17·43	4·91	5·32	1·59	1·65
Normanby ...	22·50	16·71	25·69	16·62	2·95	3·49	1·72	1·52
Polwarth ...	30·34	20·21	37·56	22·95	4·84	4·92	2·29	1·93
Ripon ...	25·21	24·01	20·54	23·85	2·09	2·13	1·89	1·93
Rodney ...	23·89	16·28	18·25	15·99	·90	...	1·44	1·04
Talbot ...	26·12	29·82	24·55	25·80	2·41	2·69	1·88	1·82
Tambo ...	37·09	27·01	23·50	26·67	4·67	5·94	2·04	1·92
Tanjil ...	25·76	19·03	32·39	32·77	3·79	4·29	2·06	1·78
Tatchera ...	25·81	17·21	16·64	11·85	1·33	·83	1·57	·99
Villiers ...	27·72	18·82	38·70	24·80	4·15	5·25	2·08	2·10
Wonnangatta	17·76	19·46	28·00	20·00	3·34	3·72	1·31	1·72
Total ...	23·87	22·25	20·18	17·91	3·33	3·79	1·48	1·37

Yield of oats, barley, potatoes, and hay, 1890-91.

449. It will be noticed that in the year ended 1st March, 1891, the highest acreable yield of oats was in Dargo, Grant, Benambra, Talbot, Bourke, and Tambo, in the order named; that the average yield of barley was highest in Dargo and Tanjil, Bourke, Grant, Benambra, Tambo, and Grenville; that potatoes yielded the largest crop per acre in Tambo, Dargo, Mornington, Hampden, Villiers, Buln Buln, Polwarth, Benambra, Croajingolong, and Tanjil, where the average was over 5 tons; that the highest yields of hay were in Villiers and

Hampden, in which this crop averaged over 2 tons to the acre; and in Dargo, Buln Buln, Polwarth, Ripon, Tambo, Grant, Talbot, and Tanjil, in which it exceeded $1\frac{3}{4}$ ton to the acre.

Yield of other principal crops in past two seasons.

450. Comparing the averages of 1890-91 with those of the previous season, an increase is observed in the acreable yield of oats in 14 counties, the principal being Talbot, Moira, Dalhousie, Grant, Delatite and Bourke; of barley in eleven counties, the principal being Moira, which produces half the barley grown in the colony; of hay in thirteen counties; and in potatoes in all but nine counties.

Yield of principal crops, 1872 to 1891.

451. In the past season, over the colony as a whole, the acreable yield of wheat and barley was below, but that of the other crops was above, the average; the yield per acre of wheat, however, exceeded that in all but three of the twelve years immediately preceding, although it was lower than in any of the seven years prior to that period, but the yield of barley was exceeded in all but five of the nineteen other years named in the following table:—

AVERAGE PRODUCE OF PRINCIPAL CROPS, 1872 TO 1891.

Year ended March.	Average Produce per Acre of—				
	Wheat.	Oats.	Barley.	Potatoes.	Hay.
	Bushels.	Bushels.	Bushels.	Tons.	Tons.
1872	13·45	18·76	20·00	3·22	1·40
1873	16·51	19·55	20·86	3·45	1·32
1874	13·58	15·69	19·84	2·86	1·27
1875	14·57	18·46	21·01	3·53	1·32
1876	15·49	21·92	22·20	3·37	1·33
1877	13·15	19·91	21·18	3·31	1·22
1878	12·41	19·39	19·81	3·11	1·17
1879	8·76	17·60	18·24	2·71	1·21
1880	13·29	24·00	24·67	4·04	1·45
1881	9·95	17·62	15·57	2·81	1·20
1882	9·40	24·57	19·07	3·43	1·13
1883	9·03	26·17	17·35	3·78	1·06
1884	14·10	25·07	22·84	4·01	1·43
1885	9·52	23·40	17·38	4·16	1·09
1886	8·99	21·72	17·58	3·83	1·05
1887	11·49	22·91	22·36	3·41	1·09
1888	10·81	22·92	23·34	4·11	1·41
1889	7·10	14·20	13·55	3·04	·75
1890	9·75	23·87	20·18	3·33	1·48
1891	11·13	22·25	17·91	3·79	1·37
Mean	11·62	21·00	19·75	3·47	1·24

Malting and other barley.

452. In the last seven years the statistics of malting barley were distinguished from those of other descriptions of the same

cereal. The following is the result of this division for the year under review :—

MALTING AND OTHER BARLEY, 1890-91.

Description of Barley.	Area under Crop.	Gross Produce.	Average per Acre.
	Acres.	Bushels.	Bushels.
Malting	72,348	1,200,688	16·60
Other	15,403	370,911	24·08
Total ...	87,751	1,571,599	17·91

Yield of malting smaller than of other barley.

453. Of the total area under barley 82 per cent. was under malting barley ; and of the produce of barley, 76 per cent. was of malting barley. In the previous year these proportions were respectively 78 per cent. and 66 per cent. It will be noticed that this description of barley is by far the less prolific of the two kinds, the average in 1890-91 being only 16½ bushels to the acre, as against 24 bushels of the other barley.

Average produce in Australasian colonies.

454. In the following table the average yield of wheat, oats, barley, potatoes, and hay in Victoria is placed side by side with the average of the same crops in the other Australasian colonies* during each of the eighteen years ended with 1890 :—

AVERAGE PRODUCE PER ACRE OF THE PRINCIPAL CROPS IN AUSTRALASIAN COLONIES, 1873 TO 1890.

Year ended March.	Victoria.	New South Wales.	Queensland.*	South Australia.*	Western Australia.	Tasmania.	New Zealand.
WHEAT.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1873 ...	16·51	16·32	...	11·50	6·02	18·62	24·19
1874 ...	13·58	13·43	...	7·87	13·44	16·17	25·61
1875 ...	14·57	12·87	...	11·75	12·00	18·51	28·15
1876 ...	15·49	14·66	...	11·95	11·00	16·38	31·54
1877 ...	13·15	16·43	...	5·40	12·00	19·30	28·63
1878 ...	12·41	13·84	10·63	7·76	11·00	18·12	26·03
1879 ...	8·76	14·74	13·56	7·15	9·97	16·10	22·94
1880 ...	13·29	15·48	8·11	9·78	14·94	23·22	28·16
1881 ...	9·95	14·69	20·40	4·96	14·94	14·99	25·07
1882 ...	9·40	15·35	8·41	4·57	7·00	18·88	22·69
1883 ...	9·03	16·35	13·89	4·21	11·00	20·27	26·28
1884 ...	14·10	15·00	4·34	7·94	13·00	17·74	26·02
1885 ...	9·52	15·27	16·17	7·53	13·00	19·20	25·43
1886 ...	8·99	10·32	5·11	...	11·50	17·32	24·40
1887 ...	11·49	17·38	3·13	...	12·00	17·91	24·89
1888 ...	10·81	12·06	22·10	...	9·14	16·67	26·37
1889 ...	7·10	4·76	·89	3·85†	10·50	20·16	24·22
1890 ...	9·75	15·65	15·88	7·91	14·00	15·42	25·15
Mean ...	11·55	14·14	10·97	7·61	11·47	18·05	25·88

* The produce of crops in Queensland was not given prior to 1878. No agricultural statistics were collected in South Australia in the four years ended with 1888-9. † Estimated.

Average Produce per Acre of the Principal Crops in Australasian Colonies, 1873 to 1890—*continued.*

Year ended March.	Victoria.	New South Wales.	Queensland.*	South Australia.*	Western Australia.	Tasmania.	New Zealand.
Oats.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1873 ...	19·55	19·94	...	16·39	13·24	25·85	27·00
1874 ...	15·69	18·71	...	10·61	19·22	20·98	29·81
1875 ...	18·46	16·31	...	14·61	16·00	26·82	35·22
1876 ...	21·92	18·72	...	16·69	15·00	25·40	37·79
1877 ...	19·91	21·16	...	10·65	15·00	24·21	31·24
1878 ...	19·39	19·31	10·11	11·96	14·00	22·32	31·68
1879 ...	17·60	20·24	9·65	12·01	18·02	24·82	30·11
1880 ...	24·00	21·64	24·74	15·02	19·00	28·61	36·53
1881 ...	17·62	19·87	17·94	11·50	19·00	22·13	32·05
1882 ...	24·57	21·81	12·74	10·66	10·00	28·44	28·45
1883 ...	26·17	24·88	16·58	11·13	15·00	27·34	32·89
1884 ...	25·07	21·15	8·90	14·65	17·00	27·39	35·11
1885 ...	23·40	21·87	15·17	12·20	18·00	28·65	34·84
1886 ...	21·72	19·77	4·84	...	14·50	26·82	26·11
1887 ...	22·91	25·09	10·42	...	16·14	25·95	30·92
1888 ...	22·92	20·35	24·26	...	15·05	18·20	31·24
1889 ...	14·20	13·77	5·65	...	23·42	27·97	29·89
1890 ...	23·87	24·30	19·41	12·77	20·00	28·60	32·09
Mean ...	21·05	20·49	13·88	12·92	16·53	25·58	31·83
Barley.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
1873 ...	20·86	18·96	...	14·31	14·00	22·44	21·25
1874 ...	19·84	18·61	...	10·69	17·22	19·33	27·41
1875 ...	21·01	17·33	...	15·18	16·00	24·46	29·39
1876 ...	22·20	20·46	...	14·12	14·00	27·84	35·91
1877 ...	21·18	23·69	...	10·64	15·00	23·58	28·95
1878 ...	19·81	19·68	16·86	11·97	13·00	20·28	25·40
1879 ...	18·24	21·47	15·87	11·82	12·23	24·22	24·77
1880 ...	24·67	21·46	24·68	13·38	18·00	27·91	30·47
1881 ...	15·57	20·35	20·97	11·62	18·00	20·39	26·05
1882 ...	19·07	21·04	12·53	11·47	10·00	22·29	22·28
1883 ...	17·35	20·55	17·82	11·03	14·00	27·79	26·19
1884 ...	22·84	20·96	13·24	14·01	16·00	25·57	29·31
1885 ...	17·38	21·16	24·73	13·48	16·50	29·58	30·37
1886 ...	17·58	16·16	24·20	..	14·50	25·83	25·92
1887 ...	22·36	21·87	24·07	...	15·97	22·40	25·94
1888 ...	23·34	19·20	27·03	...	11·75	13·87	27·26
1889 ...	13·55	11·08	22·94	...	14·70	23·55	31·15
1890 ...	20·18	20·79	21·24	12·54	17·00	23·75	31·67
Mean ...	19·83	19·71	20·47	12·59	14·88	23·62	27·76
Potatoes.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1873 ...	3·45	2·98	...	3·28	2·34	3·92	4·92
1874 ...	2·86	2·98	...	3·41	2·67	3·16	4·46
1875 ...	3·53	2·83	...	3·72	3·00	3·75	5·24
1876 ...	3·37	2·98	...	4·52	3·00	3·54	4·89
1877 ...	3·31	3·03	...	2·84	3·00	3·43	5·36
1878 ...	3·11	2·52	1·91	2·51	2·00	3·25	5·38
1879 ...	2·71	3·20	2·33	2·67	2·49	3·37	4·98

* See footnote (*) on page 268.

Average Produce per Acre of the Principal Crops in Australasian Colonies, 1873 to 1890—*continued.*

Year ended March.	Victoria.	New South Wales.	Queensland.*	South Australia.*	Western Australia.	Tasmania.	New Zealand.
Potatoes.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1880 ...	4·04	3·23	3·03	3·80	3·50	3·18	5·62
1881 ...	2·81	2·73	2·65	2·89	3·50	3·12	4·94
1882 ...	3·43	2·78	2·36	2·96	2·00	3·47	5·41
1883 ...	3·78	3·00	2·90	3·05	2·50	3·88	5·10
1884 ...	4·01	2·47	2·60	4·22	3·00	3·59	5·36
1885 ...	4·16	2·52	2·92	4·10	3·00	4·37	5·78
1886 ...	3·83	2·55	2·82	...	2·50	4·83	4·58
1887 ...	3·41	2·64	3·74	...	3·01	4·71	4·88
1888 ...	4·11	2·94	3·52	...	2·38	2·59	5·45
1889 ...	3·04	2·39	2·84	...	4·10	4·88	5·08
1890 ...	3·33	2·85	3·60	3·74	3·00	4·25	5·22
Mean ...	3·46	2·81	2·86	3·41	2·83	3·74	5·15
Hay.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1873 ...	1·32	1·61	...	1·21	1·51	1·39	1·25
1874 ...	1·27	1·54	...	1·02	2·00	1·08	1·43
1875 ...	1·32	1·37	...	1·26	1·50	1·35	·84
1876 ...	1·33	1·15	...	1·21	1·00	1·42	1·46
1877 ...	1·22	1·43	...	1·95	1·00	1·21	1·31
1878 ...	1·17	1·22	1·30	1·13	1·00	1·13	1·30
1879 ...	1·21	1·66	1·33	·97	1·00	1·19	1·22
1880 ...	1·45	1·45	1·96	1·12	1·25	1·52	1·51
1881 ...	1·20	1·33	1·95	·96	1·25	1·13	1·27
1882 ...	1·13	1·35	1·16	·72	·75	1·29	1·30
1883 ...	1·06	1·35	1·67	·75	1·00	1·30	1·24
1884 ...	1·43	1·28	1·39	1·06	1·00	1·29	1·39
1885 ...	1·09	1·24	1·40	·93	1·00	1·24	1·41
1886 ...	1·05	·88	1·06	...	1·00	1·24	1·14
1887 ...	1·09	1·57	1·92	...	1·00	1·06	1·36
1888 ...	1·41	1·35	2·02	..	·94	1·14	1·49
1889 ...	·75	·64	1·54	...	1·00	1·11	1·41
1890 ...	1·48	1·73	1·93	1·20	1·00	1·45	1·43
Mean ...	1·22	1·34	1·59	1·11	1·12	1·25	1·32

Note.—All the calculations in this table were made in the office of the Government Statist, Melbourne. For the land under and total produce of each crop in the respective colonies during the eighteen years ended with 1890-91, see summary of Australasian Statistics (third folding sheet) *ante*; and for average yields per acre in 1890-91, see Table XVI. of Appendix A., *post*.

Colonies with highest and lowest average yields.

455. It will be observed that, according to the mean of the whole period, the average produce of wheat, oats, barley, and potatoes is much the highest in New Zealand, and that of hay is highest in Queensland. The lowest average yield of wheat, oats, barley, and hay is in South Australia; and the yield of potatoes is lowest in New South Wales, Western Australia, and Queensland, in which the

* See footnote (*) on page 268.

difference in the average yield is very slight. Victoria stands third in regard to the average per acre of oats and potatoes, fourth in regard to wheat and barley, and fifth in regard to hay.

456. It will further be noticed that in 1889-90, with the exception of wheat in Victoria, Tasmania, and New Zealand; oats and barley in South Australia; potatoes in Victoria and Queensland; and hay in Western Australia, the average produce of all the crops named was above the mean of the eighteen years to which reference is made. Average produce 1889-90 and previous years compared.

457. The next table shows the acreage under various crops in the United Kingdom, Australasia, British North America, the Cape of Good Hope, the principal countries on the continent of Europe and the United States of America. All the information has been taken from official documents :— Land under crop in British and Foreign countries.

LAND UNDER CERTAIN CROPS IN SOME BRITISH AND FOREIGN COUNTRIES (000's OMITTED).

Country.	Year.	Number of Acres under—				
		Wheat.	Oats.	Barley.	Rye.	Potatoes.
The United Kingdom ...	1890	2,484,	4,138,	2,301,	69,	1,321,
Australasia	1889-90	3,870,	738,	169,	...	126,
Canada—						
Ontario	1889	1,220,	1,923,	875,	...	146,
Quebec, Nova Scotia, and New Brunswick	1881	305,	...	...	...	235,
Manitoba	1889	623,	219,	80,	...	12,
Prince Edward Island, British Columbia, and the Territories	1885	67,	35,	12,	...	4,
Cape of Good Hope ...	1875	188,	115,	29,	...	9,
Austria	1888	2,929,	4,629,	2,795,	4,994,*	2,734,
Belgium	1883	811,	616,	99,	686,	492,
Denmark	1881	138,	991,	781,	660,	110,
France	1888	17,235,*	9,224,	2,207,	4,023,	3,571,
Germany	1889	4,832,	9,600,	4,162,	14,331,	7,207,
Holland	1887	210,	285,	111,	504,	364,
Hungary	1889	7,190,	2,514,	2,486,	2,673,	1,085,
Italy	1883	11,700,	1,100,	856,	397,	173,
Norway	1875	11,	224,	138,	37,	86,
Russia in Europe ...	1887	28,882,	34,887,	12,443,	64,612,	3,713,
Sweden	1888	1,096,†	2,767,‡	...	...	380,
United States ...	1889	38,124,	27,462,	...	...	...

458. The official returns of the various countries contain statements of produce, and these are given in the following table. The Gross yield of crops in British and Foreign countries.

* Including spelt (*Triticum spelta*).
† Including also rye.
‡ Including also barley and mixed corn.

produce of potatoes is not returned in tons, as in the Australasian colonies, but in bushels :—

GROSS PRODUCE OF CERTAIN CROPS IN SOME BRITISH AND FOREIGN COUNTRIES (000's OMITTED).

Country.	Year.	Number of Bushels* of—				
		Wheat.	Oats.	Barley.	Rye.	Potatoes.
The United Kingdom	1890	76,075,	171,146,	80,714,	...	184,880,
Australasia ...	1889-90	42,480,	21,198,	3,759,	...	19,613,
Canada—						
Ontario	1889	18,699,	64,346,	23,386,	...	14,355,
Quebec, Nova Scotia, and New Brunswick	1881	3,070,	25,161,	2,064,	...	29,213,
Manitoba ...	1889	7,201,	3,415,	1,051,	...	1,393,
Prince Edward Island, British Columbia, and the Territories	1885	1,147,	1,046,	257,	...	480,
Cape of Good Hope ...	1890	1,983,	942,	520,	...	844,
Austria	1888	50,245,	101,972,	55,578,	79,274,†	319,385,
Belgium	1889	18,970,	27,443,	3,536,	17,561,	114,074,
Denmark	1889	4,791,	25,577,	19,187,	16,680,	16,794,
France	1888	271,537,†	233,634,	43,453,	61,016,	407,153,
Germany	1889	87,146,	231,511,	85,445,	236,419,	1,047,056,
Holland	1887	6,677,	11,750,	5,077,	13,350,	74,393,
Hungary	1889	90,637,	42,291,	33,450,	35,655,	110,277,
Italy	1888	101,033,	13,722,	6,567,	3,536,	24,613,
Norway	1875	276,	8,896,	4,285,	1,016,	19,591,
Russia in Europe ...	1889	172,909,	474,044,	112,030,	534,322,	293,605,
Sweden	1889	3,594,	48,057,	13,665,	20,279,	68,554,
United States ...	1889	475,254,	728,067,	...	...	...

Average yield of wheat in United Kingdom.

459. Until 1884 no official return was made of the produce of crops in the United Kingdom. Estimates more or less reliable have frequently been made by private persons, especially of the wheat yield. The London *Statist's* Annual Supplement of the 31st January, 1885, gives a statement originally taken from *The Times*, and evidently prepared with great care, of the assumed yield per acre of this crop in the eighteen years ended with 1883, and this has been supplemented by the official figures for the seven years ended with 1890, published by the Agricultural Department of the Privy Council Office:—

* The produce was originally given in Imperial bushels, except in the case of Germany, where it was stated in cwts., and the United States in Winchester bushels. Moreover, the potato crop of Austria, Belgium, France, and Italy was stated in cwts., and that of Australasia in tons. All these have been converted into Imperial bushels upon the assumption that 60 lbs. of wheat, 40 lbs. of oats, 50 lbs. of barley or rye, and 56 lbs. of potatoes are in each case equal to an Imperial bushel; also that a Winchester bushel is equivalent to about ·9688 of an Imperial bushel.

† Including also spelt (*Triticum spelta*).

Average Produce per Acre of Wheat in the United Kingdom, 1866 to 1890.

	Bushels per Acre.		Bushels per Acre.		Bushels per Acre.
1866 ...	27	1875 ...	23	1883 ...	26
1867 ...	25	1876 ...	27	1884 ...	30
1868 ...	34	1877 ...	22	1885 ...	31
1869 ...	27	1878 ...	30	1886 ...	27
1870 ...	32	1879 ...	18	1887 ...	32
1871 ...	27	1880 ...	26	1888 ...	28
1872 ...	23	1881 ...	27	1889 ...	30
1873 ...	25	1882 ...	28	1890 ...	31
1874 ...	31				

460. The average produce in the 25 years was about 27 bushels per acre, which is much above the yield in any of the Australasian colonies except in New Zealand. The yield in 1890 (31 bushels to the acre) was, it will be observed, equalled in two and exceeded in three previous seasons. Wheat yield in United Kingdom and colonies.

461. The acreable produce for the latest year in the countries named in a previous table has been calculated in the office of the Government Statist, Melbourne, and is given in the following table:— Average yield of crops in British and Foreign countries.

Average Produce per Acre of some British and Foreign Countries.

Country.	Bushels* per Acre of—				
	Wheat.	Oats.	Barley.	Rye.	Potatoes.
The United Kingdom ...	30·6	41·4	35·0	...	140·0
Australasia	11·0	28·7	22·2	...	155·7
Canada—					
Ontario	15·3	33·5	26·7	...	98·3
Quebec, Nova Scotia, and New Brunswick	9·9	...	...	...	124·3
Manitoba	11·6	15·6	13·1	...	116·0
Prince Edward Island, British Columbia, and the Territories	17·1	29·9	21·4	...	120·0
Cape of Good Hope ...	20·3	10·7	25·8	...	83·2
Austria	17·2	22·0	19·9	14·0	116·8
Belgium	23·3	44·5	35·7	25·8	231·8
Denmark	34·7	25·8	24·4	25·4	152·8
France	18·0	25·3	19·7	15·2	114·0
Germany...	18·0	24·1	20·7	16·1	149·1
Holland	31·8	41·2	45·7	26·5	204·7
Hungary...	12·6	16·8	13·4	13·4	101·6
Italy	8·6	12·5	7·7	8·9	142·3
Norway	25·1	39·7	31·0	27·5	227·8
Russia in Europe	5·9	13·6	9·0	8·3	79·0
United States	12·4	26·4	...	...	...

* See footnote (*) to table following paragraph 458 *ante*.

Yield of wheat in Foreign countries and Australasia.

462. It will be observed that the yield of wheat per acre was 35 bushels in Denmark, 32 bushels in Holland, 30½ bushels in the United Kingdom, 25 bushels in Norway, 23 bushels in Belgium, 20 bushels in the Cape of Good Hope, 18 bushels in France and Germany, 17 bushels in Austria and British Columbia, 15 bushels in Ontario, 13 in Hungary, 12 in the United States and Manitoba, all of which were above the average of Australasia; but the wheat yields of Quebec, Italy, and European Russia were below the average of that group of colonies.

Yield of oats, barley, and potatoes in Foreign countries and Australasia.

463. According to the figures, the yield per acre of oats is higher in Australasia than in Manitoba, the Cape of Good Hope, Austria, Denmark, France, Germany, Hungary, Italy, European Russia, or the United States, but lower than in any other of the countries named. The yield of potatoes in Australasia is above that in any of the other countries named except Belgium, Holland, and Norway.

Wheat crop of the world.

464. The following table contains a statement of the wheat crop in various countries of the world in the three years ended with 1890. The figures for the first two years have been taken from a carefully prepared paper on "The World's Wheat Crop and Wheat Values," read by Mr. J. W. Rush before the National Association of British and Irish Millers at the convention held in Edinburgh, on the 30th July, 1890*, and those for 1890 from the Report of the Department of Agriculture, Washington, U.S., for April, 1891:—

WHEAT CROP OF THE WORLD, 1888 TO 1890
(000's OMITTED).

Countries.	Bushels.		
	1888.	1889.	1890.
EUROPE.			
Austria	49,584,	36,400,	49,835,
Hungary	137,664,	91,856,	160,186,
Belgium	16,000,	18,000,	18,927,
Bulgaria	36,000,	35,200,	35,200,†
Denmark	3,840,	5,000,	5,595,
France	275,344,	314,000,	328,328,
Germany	92,024,	85,000,	91,938,
Greece	10,000,	11,000,	11,991,
Holland	4,800,	6,000,	6,000,†
Italy	101,040,	100,640,	122,659,
Portugal	6,800,	8,000,	7,994,
Roumania	56,480,	43,496,	61,958,

* See *The Miller* (London Journal) of the 4th August, 1890, page 219.
† Figures for 1889 repeated.

WHEAT CROP OF THE WORLD, 1888 TO 1890 (000's OMITTED)—*continued.*

Countries.	Bushels.		
	1888.	1889.	1890.
EUROPE—*continued.*			
Russia (including Poland)	312,000,	190,000,	213,215,
Servia	8,600,	6,000,	9,973,
Spain	65,760,	73,600,	67,954,
Sweden	3,696,	3,704,	4,231,
Norway	400,	400,	
Switzerland	2,000,	2,400,	2,397,
Turkey (Europe)	40,000,	36,000,	35,975,
United Kingdom	74,488,	75,880,	75,862,
Total for Europe	1,296,520,	1,142,576,	1,310,218,
Algeria	21,960,	15,760,	21,984,
Argentine Republic	12,000,	24,000,	39,301,
Australasia*	26,200,	42,480,	32,840,
Asia Minor	36,000,	36,000,	35,975,
Canada	32,000,	30,000,	38,006,
Cape Colony	4,000,	4,400,	3,590,
Chile	12,000,	15,000,	17,987,
Egypt	8,000,	7,000,	7,994,
India	260,368,	237,144,	228,002,
Persia	22,400,	22,000,	21,984,
Syria	14,000,	12,000,	11,991,
United States	415,864,	490,560,	386,805,
Total out of Europe ...	864,792,	935,544,†	846,459,
Grand Total	2,161,312,	2,078,120,	2,156,677,

Value of world's wheat crop.

465. Supposing these figures to be correct, and the wheat to be worth four shillings per bushel, the total value of the world's wheat crop would be over four hundred and thirty-two millions sterling in 1888, nearly four hundred and sixteen millions sterling in 1889, and four hundred and thirty-one millions sterling in 1890.

Experimental farm, Dookie.

466. 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, as well as 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 a Government

* Corrected by Australasian final returns.

† This total is 800, less than the sum of the above figures.

Experimental Farm.* The following account of the present state of the farm has been furnished for this work by Mr. D. Martin, 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.

The total receipts for the year 1890 were £2,280 and the expenditure £2,662. Of the amount expended £286 was paid for additional plant, £861 for live stock, and £454 for labour. So far as possible, the provisions necessary for the students at the Agricultural College, and the staff thereof, were obtained from the farm.

Since the erection of the new dairy, and the use of the De Laval Cream Separator, there has been no trouble in obtaining a sufficient supply of good butter. The farm is now fairly equipped as regards implements and machinery.

During the year the rain-fall recorded was 28·33 inches.

40	acres of Lucerne are doing well.				
40	„	Ensilage	yielded	280	tons.
84	„	Hay	„	90	tons.
50	„	Steinwedel wheat ...	„	14	bus. per acre.
18	„	Frampton „ ...	„	14	„ „
34	„	W. Essex „ ...	„	15	„ „
15	„	Ward's prolific „ ...	„	12	„ „
70	„	Farmers' friend „ ...	„	18	„ „

The other cultivation paddocks were too wet for sowing, and much of the crop was damaged by locusts.

Numerous experiments were conducted with varieties of wheat, barley and oats, peas, grasses, clovers, sorghums, etc.

Various manures were tested at their monetary value, as compared with stable manure; also various methods of putting a crop of wheat in and sowing at different depths, and quantity of seed per acre.

There are 25 acres under vines, and the vintage of this year gave 405 gallons wine per acre. Of the above there are 5 acres of various wine grapes, planted in 1880; 7 acres of various table grapes, planted in 1887; 5 acres of Gordo Blanco and Zante Currants, planted in 1888; and 8 acres of Red Hermitage, planted in 1889.

A variety of medicinal and other plants is also grown on the farm for educational purposes.

The valuation of the farm and its belongings at the end of 1890 was as follows :—

Farm and improvements	£20,991
Buildings	4,456
Horse stock	476
Cattle, Shorthorn	476
„ Hereford	380
„ Ayrshire	140
„ Common	479
Pigs	140
Sheep	972
Implements and machinery	1,657
Bees	35
Wine	203
Furniture, etc.	90
Dairy	150
	£30,645

The average cost of maintenance of 40 students per head per annum is £25 2s. 6d.

* For further particulars relating to the establishment and development of the farm, see *Victorian Year Book*, 1888-9, Vol. II., paragraph 448.

Agricultur colleges.

467. An Act for the establishment of Agricultural Colleges* was passed towards the close of 1884. The following particulars respecting this Act and its operations have been supplied by Mr. D. Martin, the Secretary for Agriculture :—

This Act provides for the permanent reservation from sale of 150,000 acres of Crown lands by way of endowment of State Agricultural Colleges and Experimental Farms, which, together with other lands reserved as sites for such institutions prior to the passing of the Act, are to be vested in three trustees to be appointed by the Governor in Council. The Act also provides for the appointment of a Council of Agricultural Education, consisting of eleven members, three of whom are to be the trustees just mentioned, one to be the Secretary for Agriculture (who is to be the treasurer of the council), five to be elected annually by the governing bodies of Agricultural Societies in Victoria, and two to be appointed by the Governor in Council. The trustees, subject to regulations made by the Council of Agricultural Education, may lease lands for building purposes for periods not exceeding 33 years, and for other purposes for periods not exceeding 14 years, and upon a requisition of the same council may dedicate, as sites for Agricultural Colleges and Experimental Farms, any lands purchased by them or described in the Act. All moneys received by the council from the sale of stock or farm produce, or as fees from students at Agricultural Colleges and Experimental Farms, together with all other money coming to the council, are to form a fund to be called the Agricultural College Fund, which is to be expended in providing instruction for students, or in purchasing stock, seed, agricultural implements, and all other necessaries for the education of the students and the proper working of the Experimental Farms, etc. The council, subject to Ministerial approval, have the appointment of professors, teachers, officers, and servants for the Colleges and Experimental Farms. Most of the proceedings of the trustees and of the council have to be approved by the Governor in Council before coming into effect. The Act was amended in 1885, so as to provide for five members being elected by members of Agricultural Societies in lieu of by the governing bodies of such societies ; also for the elections to be held once in every three years, instead of being held annually.

Of the land intended as endowment, 137,537 acres have been reserved and vested in the trustees, and 125,226 acres of the land so vested have been leased for agricultural and grazing purposes. The total of the annual rents payable amount to £6,312. The areas reserved under section 4 of Act No. 825, as sites for Colleges and Experimental Farms, amounted to 13,393 acres.

Dookie Agricultural College.

The first school was erected on the Dookie Experimental Farm Reserve. The buildings comprise lecture hall, dining hall, class rooms, teachers' quarters, sleeping accommodation for forty pupils, baths, out offices, etc. The school was opened on the 1st October, 1886. The full number of pupils for which there is accommodation is forty.

The course of instruction comprises chemistry, botany, entomology, geology, advanced English, arithmetic, mensuration, surveying, book-keeping, practical work on the farm, instruction in field operations, the use of farm implements and machinery, and the management of live stock.

No fee is charged for instruction, but a payment of £25 per annum has to be made for each pupil to cover the cost of maintenance.

Longerenong Agricultural College.

The Longerenong Agricultural College was established in March, 1889, upon the Longerenong Experimental Farm Reserve, 7½ miles north-east of Horsham. The reserve comprises 2,386 acres of good agricultural land, and the farm fairly represents, in regard to both soil and climate, the Wimmera district and the north-western division of the colony. The college is a handsome building, providing

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* The *Agricultural Colleges Act* 1884 (48 Vict. No. 825). This and subsequent amending Acts were consolidated by 54 Vict. No. 1062.

accommodation for 35 students, and additions are now in progress which will provide for a total of 40 students. The additions will make a large room available for a library, and a suitable building is also being erected for a chemical laboratory. The course of instruction is the same as at the Dookie Agricultural College, and the teaching staff consists of the principal, who lectures upon agriculture, a science master and an English master, while upon the farm students receive practical instruction from the farm foreman, the gardener, the ploughman, the stockman, and the mechanic.

Upon the farm 250 acres are under cultivation, and the stock consists of heavy and light draught horses, shorthorn and Hereford cattle, crossbred dairy cows, merino and crossbred sheep, Berkshire pigs, and poultry of various kinds. The crops are wheat, oats, barley, rye, rape, lucerne; and the making of ensilage receives special attention, a large brick silo having been provided. In addition to the ordinary farm crops there are 15 acres devoted to the carrying out of various experiments. There are 24 varieties of wheat being tried on the experimental plots, and tests are being made of various methods of sowing and cultivating, in addition to testing the efficacy of different manures. An area of 25 acres has been successfully planted with vines, fruit trees, forest trees, and ornamental shrubs. The plantations of forest trees are being extended every season, while the vine planting has been completed for the present by adding to the previously established vineyard of table and raisin grapes 5 acres of wine grapes, so as to gain experimental knowledge concerning the suitability of the north-western district for the various branches of the viticultural industry.

The dairy, which has been especially built to serve the requirements of a warm climate, is furnished with a De Laval cream separator, Lawrence cooler, and butter workers, and the management of the dairy is entirely in the hands of the advanced students.

The water supply of the farm is provided for by two large dams and two excavated tanks. A branch channel of the Dooen pumping scheme runs through several of the paddocks, so that in case of drought the tanks and dams could be filled from this source. It has also been arranged that irrigation shall be carried out upon a fairly extensive scale whenever a supply of water for that purpose is provided by the district Irrigation Trust.

The rainfall for 1890 was 18·85 inches, but the season was an exceptionally wet one, the average being about 16 inches.

Breadstuffs available for consumption.

468. The following table shows, for 1840 and each subsequent year, the quantity of wheat grown in Victoria, and the quantity of wheat, flour, and biscuit imported after deducting exports, or exported after deducting imports; also the residue of breadstuffs left for consumption during each of those years :—

BREADSTUFFS AVAILABLE FOR CONSUMPTION, 1840 TO 1890.

Year.	Wheat grown in Victoria.	Wheat, Flour, and Biscuit.*		
		Imported after deducting Exports.	Exported after deducting Imports.	Available for Consumption.
	Bushels.	Bushels.	Bushels.	Bushels.
1840	12,600	57,771	...	70,371
1841	50,420	116,350	...	166,770
1842	47,840	119,004	...	166,844
1843	55,360	58,616	...	113,976
1844	104,040	98,581	...	202,621
1845	138,436	74,699	...	213,135

* The quantities of flour and biscuit imported and exported are reduced to their equivalent in bushels, on the assumption that 1 bushel of wheat produces 45 lbs. of either of those articles.

Breadstuffs Available for Consumption, 1840 to 1890 —*continued.*

Year.	Wheat grown in Victoria	Wheat, Flour, and Biscuit.*		
		Imported after deducting Exports.	Exported after deducting Imports.	Available for Consumption.
	Bushels.	Bushels.	Bushels.	Bushels.
1846	234,734	43,928	...	278,662
1847	345,946	36,871	...	382,817
1848	349,730	64,726	...	414,456
1849	410,220	76,092	...	486,312
1850	525,190	55,564	...	580,754
1851	556,167	216,811	...	772,978
1852	733,321	1,208,006	...	1,941,327
1853	498,704	1,499,994	...	1,998,698
1854	154,202	1,385,465	...	1,539,667
1855	250,091	1,985,496	...	2,235,587
1856	1,148,011	2,236,406	...	3,384,417
1857	1,858,756	1,958,905	...	3,817,661
1858	1,808,439	1,504,760	...	3,313,199
1859	1,563,113	1,957,610	...	3,520,723
1860	2,296,157	1,565,423	...	3,861,580
1861	3,459,914	1,522,517	...	4,982,431
1862	3,607,727	183,106	...	3,790,833
1863	3,008,487	191,107	...	3,199,594
1864	1,338,762	1,868,990	...	3,207,752
1865	1,899,378	1,800,932	...	3,700,310
1866	3,514,227	1,754,699	...	5,268,926
1867	4,641,205	15,190	...	4,656,395
1868	3,411,663	162,038	...	3,573,701
1869	4,229,228	719,589	...	4,948,817
1870	5,697,056	...	95,654	5,601,402
1871	2,870,409	1,179,583	...	4,049,992
1872	4,500,795	389,963	...	4,890,758
1873	5,391,104	...	138,088	5,253,016
1874	4,752,289	...	40,714	4,711,575
1875	4,850,165	200,369	...	5,050,534
1876	4,978,914	258,931	...	5,237,845
1877	5,279,730	...	384,118	4,895,612
1878	7,018,257	...	1,005,968	6,012,289
1879	6,060,737	...	957,384	5,103,353
1880	9,398,858	...	3,578,733	5,820,125
1881	9,727,369	...	3,892,974	5,834,395
1882	8,714,377	...	3,321,532	5,392,845
1883	8,751,454	...	2,376,530	6,374,924
1884	15,570,245	...	8,232,605	7,337,640
1885	10,433,146	...	3,745,985	6,687,161
1886	9,170,538	...	2,226,907	6,943,631
1887	12,100,036	...	3,897,987	8,202,049
1888	13,328,765	...	4,373,959	8,954,806
1889	8,647,709	...	1,357,334	7,290,375
1890	11,495,720	...	2,185,644	9,310,076

Note.—In 1890 the imports of breadstuffs amounted to 192,958 bushels, valued at £35,345, but the exports of breadstuffs amounted to 2,378,602 bushels, valued at £507,482. The balance in favour of exports was, therefore, 2,185,644 bushels, valued at £472,137.

* The quantities of flour and biscuit imported and exported are reduced to their equivalent in bushels, on the assumption that 1 bushel of wheat produces 45 lbs. of either of those articles.

Population and breadstuffs.

469. It will be observed that in the last fourteen years and three previous ones, viz., 1870, 1873, and 1874, the colony has raised enough breadstuffs for the consumption of its own inhabitants. In each of these seventeen years there was a surplus of Victorian-grown wheat remaining for export, the quantity in 1884, however, being more than twice as large as that in any of the other years, except 1888; whilst, owing to the drought, the quantity in 1889 was much less than in any other year since 1879. The following table shows, for each year, the mean population of Victoria, the quantity of breadstuffs available for consumption, and the probable manner of consumption, distinguishing the estimated quantity of wheat used for seed, or for the feeding of live stock, poultry, etc., from the wheat, flour, and biscuit used for food, the total quantity of the latter being shown as well as the quantity per head:—

POPULATION AND BREADSTUFFS, 1840 TO 1890.

Year.	Mean Population.	Wheat, Flour, and Biscuit.*			
		Quantity Available for Consumption.	Probable Manner of Consumption.		
			For Seed, etc.	For Food.†	
				Total.	Per Head.
		Bushels.	Bushels.	Bushels.	Bushels.
1840	8,056	70,371	3,880	66,491	8·25
1841	15,353	166,770	3,404	163,366	10·64
1842	22,107	166,844	4,864	161,980	7·33
1843	23,951	113,976	9,348	104,628	4·37
1844	25,418	202,621	13,839	188,782	7·43
1845	29,007	213,135	22,933	190,202	6·56
1846	34,807	278,662	31,604	247,058	7·10
1847	40,635	382,817	35,359	347,458	8·55
1848	47,163	414,456	38,775	375,681	7·97
1849	58,805	486,312	48,494	437,818	7·45
1850	71,191	580,754	57,020	523,734	7·36
1851	86,825	772,978	59,247	713,731	8·22
1852	132,905	1,941,327	33,646	1,907,681	14·35
1853	195,378	1,998,698	15,107	1,983,591	10·15
1854	267,371	1,539,667	25,654	1,514,013	5·66
1855	338,315	2,235,587	85,372	2,150,215	6·36
1856	380,942	3,384,417	160,310	3,224,107	8·46
1857	430,347	3,817,661	174,460	3,643,201	8·47
1858	483,827	3,313,199	156,468	3,156,731	6·52
1859	517,390	3,520,723	214,185	3,306,538	6·39
1860	534,055	3,861,580	322,503	3,539,077	6·62
1861	539,824	4,982,431	393,844	4,588,587	8·50
1862	548,080	3,790,833	324,018	3,466,815	6·33
1863	562,960	3,199,594	298,784	2,900,810	5·15

* The quantities of flour and biscuit imported and exported are reduced to their equivalent in bushels, on the assumption that 1 bushel of wheat produces 45 lbs. of either of those articles.

† Including stocks in store or retained by the farmers.

Population and Breadstuffs, 1840 to 1890—*continued.*

Year.	Mean Population.	Wheat, Flour, and Biscuit.*			
		Quantity Available for Consumption.	Probable Manner of Consumption.		
			For Seed, etc.	For Food.†	
				Total.	Per Head.
		Bushels.	Bushels.	Bushels.	Bushels.
1864	586,450	3,207,752	250,080	2,957,672	5·04
1865	611,218	3,700,310	357,256	3,343,054	5·47
1866	629,038	5,268,926	417,176	4,851,750	7·71
1867	644,276	4,656,395	433,978	4,222,417	6·55
1868	663,092	3,573,701	519,608	3,054,093	4·61
1869	687,202	4,948,817	577,028	4,371,789	6·36
1870	713,195	5,601,402	568,334	5,033,068	7·06
1871	737,005	4,049,992	669,218	3,380,774	4·59
1872	753,198	4,890,758	653,128	4,237,630	5·63
1873	765,511	5,253,016	699,952	4,553,064	5·95
1874	777,656	4,711,575	665,872	4,045,703	5·20
1875	787,337	5,050,534	642,802	4,407,732	5·60
1876	796,558	5,237,845	802,834	4,435,011	5·57
1877	808,605	4,895,612	1,129,128	3,766,484	4·66
1878	821,466	6,012,289	1,383,244	4,629,045	5·64
1879	834,030	5,103,353	1,414,376	3,688,977	4·42
1880	850,343	5,820,125	1,954,570	3,865,555	4·55
1881	868,942	5,834,395	1,853,458	3,980,937	4·58
1882	889,720	5,392,845	1,938,724	3,454,121	3·88
1883	910,130	6,374,924	2,208,784	4,166,140	4·58
1884	932,630	7,337,640	2,192,708	5,144,932	5·52
1885	956,880	6,687,161	2,040,164	4,646,997	4·86
1886	984,860	6,943,631	2,105,370	4,838,261	4·91
1887	1,016,750	8,202,049	2,465,886	5,736,163	5·64
1888	1,054,980	8,954,806	2,434,382	6,520,424	6·18
1889	1,090,350	7,290,375	2,357,470	4,932,905	4·52
1890	1,118,500	9,310,076	2,290,326	7,019,750	6·28

Consumption of breadstuffs per head.

470. The estimated average quantity of breadstuffs available for food to each individual of the population is shown in the last column of the table. This will be found to vary in different years, ranging from over 14 bushels in 1852, between 10 and 11 bushels in 1841 and 1853, to between 4 and 5 bushels in 1843, 1868, 1871, 1877, and in seven of the twelve years since 1878; but in only one year, viz., 1882, to less than 4 bushels per head. The proportion per head reached $5\frac{1}{2}$ bushels in 1884, which was the year of an exceedingly bountiful harvest, and to as high as $5\frac{2}{3}$, $6\frac{1}{6}$, and $6\frac{1}{4}$ bushels in 1887, 1888, and 1890 respectively, the low price of wheat in England having, probably, acted as a check upon exportations in those years; whereas in 1889 it fell, owing to the drought, to $4\frac{1}{2}$ bushels.

* The quantities of flour and biscuit imported and exported are reduced to their equivalent in bushels, on the assumption that 1 bushel of wheat produces 45 lbs. of either of those articles.

† Including stocks in store or retained by the farmers.

Average consumption of breadstuffs.

471. The quantity of breadstuffs available for annual food-consumption per head has averaged $5\frac{2}{3}$ bushels over the whole period of fifty-one years, but during the ten years ended with 1890 it averaged about 5 bushels, or two-thirds of a bushel less. In the present state of the Victorian population, it may be fair to assume that from $4\frac{1}{2}$ bushels to 5 bushels per head, irrespective of the quantity required for seed, is amply sufficient to supply the wants of any given year.

Breadstuffs available for consumption in United Kingdom.

472. In the United Kingdom, animal food, in consequence of its high price, is used much more sparingly than it is in this country, especially by the working classes, and therefore, as a natural consequence, the consumption of breadstuffs in proportion to the numbers of the population is, on the average, somewhat higher than it is here. The following table shows the estimated mean population of the United Kingdom during each of the twenty-two harvest years (or periods extending from 1st September to the 31st August) ended with 1887-8; also the total number of bushels, and number of bushels per head, of grown and imported wheat available for consumption, after deducting seed, in each of the same years :—

BREADSTUFFS AVAILABLE FOR CONSUMPTION IN THE UNITED KINGDOM, 1867 TO 1888.

Year ended 31st August.	Mean Population.	Bushels of Wheat* available for Food.	
		Total number (000's omitted).	Number per Head.
1867	30,248,936	152,320,	5·03
1868	30,523,478	155,200,	5·08
1869	30,814,914	189,360,	6·14
1870	31,108,133	176,560,	5·68
1871	31,410,776	176,400,	5·61
1872	31,728,316	170,320,	5·37
1873	32,028,317	174,640,	5·45
1874	32,325,778	174,240,	5·39
1875	32,641,568	202,720,	6·21
1876	32,978,682	184,512,	5·59
1877	33,329,099	174,568,	5·24
1878	33,681,904	191,480,	5·68
1879	34,036,546	209,936,	6·17
1880	34,364,077	179,120,	5·21
1881	34,775,970	201,992,	5·81
1882	35,410,040	210,592,	5·95
1883	35,517,510	241,568,	6·80
1884	35,838,516	191,520,	5·37
1885	36,179,000	208,000,	5·75
1886	36,519,700	206,887,	5·67
1887	36,900,486	204,000,	5·53
1888	37,453,574	206,000,	5·50

* The total number of bushels of wheat available for consumption has been taken from articles in the Supplement to the *Statist* (London journal). The calculations have been made in the office of the Government Statist, Melbourne.

473. As a result of calculations derived from the figures in the table, it appears that in the twenty-two years named the average quantity of wheat available for consumption in the United Kingdom was 5·65 bushels per head, or nearly a bushel per head more than is apparently found sufficient for the requirements of the Victorian population. Average consumption of wheat in United Kingdom.

474. According to the Government Statistician of New South Wales,* the consumption of wheat per head is considerably greater in that colony than in Victoria, and even greater than in the United Kingdom, the quantity consumed per head being in 1887 as much as 8·1 bushels; in 1888, 7·8; in 1889, only 5·6; and in 1890, 7·2 bushels; the average quantity in the five years ended with 1890 being 7·0 bushels. According to the same authority, New South Wales has never grown nearly enough wheat for her own consumption, the quantity imported in 1890, after deducting the exports, being about 1,867,381 bushels, whilst 6,570,335 bushels were grown in the colony. It should be noted, however, that the latter quantity was larger than usual; in the previous five years the average quantity grown was little over $3\frac{3}{4}$ million bushels. Consumption of wheat in New South Wales.

475. From somewhat similar calculations taken from the official returns of the United States, the estimated consumption of wheat per head of the population of that country averaged, during the five years ended with 1887-8, 5·48 Winchester bushels,† or about 5·31 Imperial bushels. As no deduction appears to have been made for the wheat required for seed in the United States returns, the quantity available for food consumption is considerably less than that shown by the figures, and is probably about the same as in Victoria. Consumption of breadstuffs per head in United States.

476. The quantity and declared value of the Victorian imports and exports of breadstuffs during the fifty-four years, 1837 to 1890, are set down in the following table:— Imports and exports of breadstuffs, 1837 to 1890.

IMPORTS AND EXPORTS OF BREADSTUFFS,‡ 1837 TO 1890.

Wheat, Flour, and Biscuit.	Quantity.	Value.
	Bushels.	£
Imported, 1837 to 1890	33,852,650	14,078,609
Exported, „ „	48,852,228	11,863,312
Imports in excess of exports ...	...	2,215,297
Exports in excess of imports ...	14,999,578	...

* See *Statistical Register of New South Wales* for 1890, Part VI. Agriculture, Minerals, Manufactories, and Works: Chapman, Sydney, 1891.

† The Winchester bushel is smaller than the Imperial bushel by one thirty-second ($\frac{1}{32}$) part.

‡ The quantity and value of breadstuffs imported and exported during each year will be found in the Statistical Summary of Victoria (first folding sheet), *ante*.

Excess of quantity exported, of value imported.

477. It will be observed that the quantity of breadstuffs exported from the colony from the period of its first settlement to the end of 1890 exceeded that imported during the same period by 15 million bushels; but, in consequence of the prices of wheat and flour during the earlier years, in which the imports invariably exceeded the exports, being much higher than in the later years, in which the exports exceeded the imports, the declared value of the breadstuffs received has exceeded that of those sent away by over $2\frac{1}{5}$ millions sterling.

Breadstuffs imported into and exported from Australasian colonies, 1890.

478. The net export of breadstuffs from the Australasian Colonies, in 1890, amounted to nearly 14 million bushels, the principal wheat exporting colonies being South Australia, New Zealand, and Victoria, in the order named. The following were the imports and exports of breadstuffs by each colony during the year :—

BREADSTUFFS IMPORTED AND EXPORTED IN AUSTRALASIAN COLONIES, 1890.

Colony.	Wheat, Flour, and Biscuit.*		Excess of—	
	Imported.	Exported.	Exports over Imports.	Imports over Exports.
	Bushels.	Bushels.	Bushels.	Bushels.
Victoria	192,956	2,378,601	2,185,645	...
New South Wales	2,809,864	1,249,499	...	1,560,365
Queensland	2,158,090	4,744	...	2,153,346
South Australia	917	10,739,743	10,738,826	...
Western Australia	130,217	...	...	130,217
Total	5,292,044	14,372,587	9,080,543	...
Tasmania	241,069	8,498	...	232,571
New Zealand	624	4,968,963	4,968,339	...
Grand Total	5,533,737	19,350,048	13,816,311	...

Net imports of agricultural products.

479. The following are the values of the net imports—*i.e.*, the values of imports after the values of the exports have been deducted—of certain vegetable productions during each of the six years ended with 1890. All the articles named are capable of being produced, and all, or nearly all, are to a certain extent now produced, in the colony :—

* The quantities have been reduced in all cases to their equivalent in bushels of wheat.

Net Imports* of certain Articles of Agricultural Produce, 1885 to 1890.

Articles.	Balance of Imports over Exports in—					
	1885.	1886.	1887.	1888.	1889.	1890.
	£	£	£	£	£	£
Oats	86,474	69,669	126,990	147,989	296,207	54,862
Barley and pearl barley	15,359	4,183	44,564	29,148	95,357	...
Malt	...	9,903	2,056	7,565	...	1,927
Maize	13,853	18,956	1,500	10,118	38,961	815
Maizena and corn flour	5,289	13,642	7,498	8,801	7,908	22,260
Beans, peas, and split peas	...	1,667	1,843	415	2,987	...
Arrowroot	2,790	558	1,105	1,872	1,455	1,587
Macaroni and vermicelli	2,441	2,066	686	2,271	2,295	1,428
Starch	8,544	14,517	3,569	6,070	9,372	1,439
Fruit—fresh, bottled, dried, currants, and raisins	152,967	146,678	226,888	212,868	234,800	295,750
Jams, jellies, and preserves	...	...	3,068	...	3,964	3,912
Nuts, almonds, walnuts	9,429	7,033	6,076	8,973	10,071	4,381
Peanuts	474	689	2,129	1,615	1,439	1,816
Ginger	3,845	3,322	2,286	3,064	1,552	1,009
Opium	28,728	32,713	29,955	33,493	38,886	33,998
Hops	6,185	13,500	28,579	18,557	38,856	14
Chicory	2,269	...	...	...	...	186
Pickles	5,570	9,386	7,620	7,005	7,853	10,285
Mustard	9,789	17,920	13,872	16,160	19,261	14,539
Oil, olive and salad ...	18,496	15,204	8,953	18,642	13,557	12,074
„ linseed ...	31,484	31,404	31,144	38,040	47,581	23,825
„ castor... ...	10,797	31,700	34,485	24,445	35,766	46,178
Linseed meal ...	446	...	459	602	...	...
Tobacco, cigars, and snuff	116,212	179,955	128,618	233,221	258,191	227,451
Flax (Phormium) ...	8,312	5,215	3,595	8,752	7,314	11,233
Hemp	29,927	17,994	33,098	43,636	49,793	53,198
Jute	3,449	1,126	...	2,636	1,165	1,640
Broom corn and millet	6,959	7,447	4,632	4,932	7,469	4,376
Bark	20,905	2,287	2,955	...	...	...
Cork	13,867	19,811	1,403	935	758	884
Vegetables (preserved)	427	897	...	1,063	269	1,609
Canary seed ...	2,008	1,314	1,571	2,181	1,817	1,924
Grass and clover seed	14,667	11,333	13,390	10,901	16,538	16,993
Seeds, undescribed ...	...	11,310	15,402	8,831	10,928	6,010
Tares	109	31	81	267	185	372
Total ...	632,071	703,430	790,070	915,068	1,262,555	857,975

480. It will be observed that barley and beans and peas are absent from the list for the last year; also that linseed meal is absent from the list in the last two years, and bark in the last three years.

Decreased imports of agricultural products.

* The total imports and total exports of these articles during 1890 will be found in the first table in Part VI. "Interchange," *ante*, under Orders 14, 22, 23, 25, and 26.

Net import of eggs.

481. In addition to the articles named in the above table, eggs, of which it might reasonably be supposed that Victoria would produce sufficient for her own consumption, were imported in 1890 to the number of 10,140,000, and to the value of £34,403; and exported to the number of only 88,146, and the value of only £235, the difference in favour of the former being 10,051,854 in number, and £34,168 in value. The value of the imports of eggs in 1889 exceeded that of the exports by £39,907, in 1888 by £34,745, in 1887 by £30,498, in 1886 by £15,020, and in 1885 by £10,200.

Proportion of land under each crop.

482. Of every thousand acres cultivated during the past season, 432 acres were placed under wheat, 83 under oats, 33 under barley, 20 under potatoes, 156 under hay, and 276 (including 145 in fallow) under other tillage. The following table shows the proportion that the land under different crops has borne to the total area under tillage during each of the last eleven years:—

PROPORTION OF LAND UNDER EACH CROP TO TOTAL UNDER CULTIVATION, 1881 TO 1891.

Year ended March.	Proportion to the Total Land under Tillage of that under—					
	Wheat.	Oats.	Barley.	Potatoes.	Hay.	Other Tillage.*
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
1881	48·97	6·72	3·43	2·25	12·51	26·12
1882	50·87	8·07	2·67	2·15	11·65	24·59
1883	47·50	8·32	2·14	1·68	15·16	25·20
1884	49·84	8·49	2·11	1·81	13·67	24·08
1885	47·19	8·08	2·68	1·66	14·62	25·77
1886	42·41	8·98	3·08	1·77	17·51	26·25
1887	43·49	7·67	1·53	2·07	18·39	26·85
1888	47·86	7·72	1·59	1·87	17·15	23·81
1889	47·46	7·70	3·26	1·68	16·04	23·86
1890	44·87	9·00	3·45	1·79	17·19	23·70
1891	43·17	8·33	3·31	2·03	15·57	27·59

Minor crops.

483. In addition to the principal crops of which mention has been made, various descriptions of minor crops are also raised. It is not, however, presumed that the whole of such crops, or the full measure to which they are grown, is recorded by the collectors. It is certain that they are often raised in gardens, in which case the different kinds would not be distinguished in the returns. It is also probable that they may be sometimes grown upon allotments of one acre in extent, or even less, which are not taken account of. The following list must, therefore, be looked upon as indicating the nature of certain

* Including land in fallow, the proportion in 1891 being 14·54.

minor crops grown in Victoria rather than the extent to which those crops have been cultivated during the last six years :—

Minor Crops,* 1886 to 1891.

Nature of Crop.		1885-6.	1886-7.	1887-8.	1888-9.	1889-90.	1890-91.
Amber cane	acres	...	...	12	34	3	2
	cane, tons	...	...	90	104	...	...
	seed, lbs.	...	...	280	120	750	300
Arrowroot	acres	3	...	...	...	...	...
	tons (root)	41	...	...	...	...	...
Artichokes	acres	...	...	3	...	...	3
	tons	...	...	55	...	...	5
Beet, carrots, parsnips	acres	386	467	485	269	396	315
	tons	4,300	4,411	4,672	2,250	4,111	4,057
Broom-millet	acres	3	...	5	12	7	3
	fibre, cwt.	5	...	72	72	41	100
	seed, bush.	20	...	28	384	64	...
Buckwheat	acres	3	...	...	...	2	3
	bushels	30	...	...	...	40	75
Canary seed	acres	...	9	...	...	...	3
	bushels	...	124	...	...	...	60
Cauliflowers and cabbages	acres	27	114	164	133	27	25
	dozens	18,500	27,360	68,345	62,830	11,800	14,928
Chicory	acres	216	204	249	148	229	258
	tons	1,239	1,472	1,375	811	1,376	1,859
Durrah	acres	...	2	...	...	...	...
Flax	acres	7	...	1	3	138	63
	fibre, cwt.	9	...	5	...	3,550	307
	linseed, bush.	18	...	7	5	507	640
French beans	acres	...	...	2	2	7	...
	tons	...	...	3	4	4	...
Garden seeds	acres	7	43	83	46	...	...
	cwt.	14	215	196	66	...	...
Gooseberries	acres	3	2	4	4	14	1
	cwt.	28	23	140	135	130	9
Grass and clover seeds	acres	2,942	4,667	4,638	1,541	3,390	2,587
	bushels	39,793	61,490	61,177	17,444	54,547	36,415
Green peas	acres	92	80	152	85	11	150
	tons	141	98	234	117	7	167
Hops	acres	896	730	685	761	829	789
	lbs.	616,112	562,576	605,360	618,128	639,632	888,272
Kail (thousand headed)	acres	...	...	...	...	9	6
	tons	...	...	...	...	225	210
Maize	acres	4,530	4,901	6,031	5,789	8,447	10,357
	bushels	181,240	231,447	318,551	267,155	357,047	574,083
Mangel-wurzel	acres	1,346	1,257	1,191	897	984	892
	tons	24,129	19,142	20,590	13,974	15,604	14,676
Medicinal herbs	acres	...	3	...	...	3	5
Melons, vegetable marrows, cucumbers, etc.†	acres	...	...	...	10	6	18
	dozens	...	...	...	3,040	560	1,871
Mulberry trees	acres	4	1	1	1	1	1
	number	...	...	1,000	1,000	1,000	1,000

* Exclusive of those grown in gardens.
† Previous to the year 1889, pumpkins, melons, vegetable marrows, and cucumbers were shown in one line.

Minor Crops,* 1886 to 1891—*continued.*

Nature of Crop.		1885-6.	1886-7.	1887-8.	1888-9.	1889-90.	1890-91.
Mustard ...	acres ...	7	20	16	34	28	8
	cwt. ...	15	100	80	112	105	7
Olives ...	acres ...	14	1	18	17	17	15
Onions ...	acres ...	1,740	1,996	2,437	1,768	1,957	2,238
	tons ...	10,209	11,625	11,774	4,430	10,815	13,961
Opium poppies	acres ...	16	11	11	8	10	14
	lbs. of opium	200	139	178	86	169	242
Oranges and lemons†	acres ...	6	2	34	7	33	67
	cases ...	...	...	...	...	270	801
Osiers ...	acres ...	5	8	...	6	5	3
	tons ...	...	5	...	11	13	8
Peas and beans	acres ...	35,460	28,672	26,692	31,222	22,784	25,992
	bushels ...	761,351	583,269	732,060	361,724	528,074	739,310
Pumpkins‡ ...	acres ...	153	69	107	158	252	196
	tons ...	1,447	536	850	959	1,251	1,273
Pyrethrum cinerariæ folium	acres ...	...	...	...	...	6	6
	cwt. ...	...	...	...	...	12	12
Rape for seed ...	acres ...	...	44	70	42	1	...
	bushels ...	...	...	940	597	14	...
Raspberries ...	acres ...	271	239	218	224	179	230
	cwt. ...	6,470	4,499	5,384	5,249	3,337	5,010
Red currants ...	acres ...	...	...	...	...	9	...
	cwt. ...	...	...	...	...	30	...
Rhubarb ...	acres ...	11	20	10	22	3	7
	tons ...	31	169	85	132	20	81
Rumax ...	acres ...	...	...	...	...	8	3
Rye ...	acres ...	654	762	1,069	1,109	1,089	948
	bushels ...	8,278	11,286	14,900	10,744	16,707	17,583
Seeds (agricultural & garden)	acres ...	...	...	...	...	71	82
	cwt. ...	...	...	...	...	252	548
Strawberries ...	acres ...	55	35	68	66	40	117
	cwt. ...	941	243	616	613	267	1,085
Sunflowers for seed ...	acres ...	...	6	8	...	...	6
	bushels ...	...	140	128	...	...	105
Teazles ...	acres ...	...	...	...	...	...	...
	number ...	...	...	...	...	...	...
Tobacco ...	acres ...	1,866	2,031	1,966	1,685	955	618
	cwt. ...	13,734	12,008	11,853	13,355	4,123	326
Tomatoes ...	acres ...	34	26	45	42	28	43
	cwt. ...	4,800	2,280	6,914	3,240	960	3,370
Turnips ...	acres ...	253	443	303	379	424	393
	tons ...	2,179	2,767	4,102	4,560	4,984	4,499
Vetches and tares for seed	acres ...	1	...	1	3	11	3
	bushels ...	40	...	20	45	116	60
Vines ...	acres ...	9,775	10,310	11,195	12,886	15,662	20,686
	wine, galls.	1,003,827	986,041	1,167,874	1,209,442	1,578,590	2,008,493
	brandy, „	3,875	3,233	3,352	2,994	5,285	5,934
Walnuts ...	acres ...	...	...	4	2	7	8

* Exclusive of those grown in gardens.

† It is estimated there are over 100 acres planted with oranges and lemons, but such plantations are seldom distinguished separately, being included under orchards.

‡ Previous to the year 1889, pumpkins, melons, vegetable marrows, and cucumbers were shown in one line.

484. In 1890-91, as compared with the previous year, an increase will be observed in the area under crop, and in the produce, of chicory, maize, melons and cucumbers, onions, pease and beans, tomatoes and vines, but a falling-off of both area and produce of beet, carrots and parsnips, mangel-wurzel and turnips. In the case of the following crops there was a falling-off in the area under crop, but an increase in the yield:—Cauliflowers and cabbages, hops, pumpkins, and rye. The other minor crops named in the table are not of much account at present, and the figures fluctuate from year to year. Increase or decrease of minor crops.

485. Hops but little inferior to Kentish are grown in Victoria, and the comparative failure for several successive seasons of this crop in the United Kingdom gave a considerable stimulus to that industry, commencing about 1882-3. The maximum was reached in the following year, when 1,760,000 lbs. were produced, but in 1884-5 there was a slight, and in 1885-6 a further considerable decline, both in the area under hops and the quality produced; a gradual improvement, however, has taken place since 1887-8, and although in the year under notice, the area under crop was slightly less than in the previous year, the yield was larger not only than in that, but than in any other year since 1884-5. Hops.

486. Raspberries as a field crop are extensively grown in the more elevated parts of the colony, especially about the ranges in which the River Yarra and its tributaries have their source. The quantity returned as raised in 1890-91 was 5,010 cwt., or about 1,673 cwt. more than in 1889-90, but less than in any of the previous four years, with the exception of 1886-7. Since the establishment of jam factories, the fruit is in great demand, and much more would be purchased were it forthcoming. Raspberries.

487. At a very early period of the colony's history, it was the custom of the pastoral occupiers of the soil to cultivate tobacco in small quantities for the purpose of making a decoction wherein to dip their sheep for the cure of the disease called "scab." That complaint has ceased to exist amongst the Victorian flocks; but of late years tobacco has been grown for the purpose of manufacture into an article suitable for the use of man. The tobacco industry, however, appears to be on the decline, as only 618 acres were returned as under it in the year under notice as against 955 acres in the previous year. The crop, moreover, was a comparative failure, only 326 cwt. having been obtained. It was stated that 505 acres under this crop produced nothing. Tobacco.

Tobacco crop in various countries.

488. In 1888, the tobacco crop of the United States is estimated to have amounted to 5 million cwt., which, with the exception of the crop of 1885, which slightly exceeded it, is the largest tobacco crop ever raised in that country. The average crop during the five years ended with 1887 was 4,418,862 cwt., which figures, together with the figures for several European countries and for Australasia during the latest year for which information is obtainable, were as follow :—

TOBACCO CROP IN VARIOUS COUNTRIES.

	cwt.		cwt.
United States (1883-7) ...	4,418,862	Italy	120,748
Austria-Hungary ...	1,277,218	Holland (1884)	58,583
Russia (1884)	1,500,000	Australasia (1889-90) ...	*34,480
Germany	758,373	Turkey	70,000
France...	421,731		

Consumption of tobacco in various countries.

489. The annual consumption of tobacco in Victoria ranges from 2·61 lbs. to 3·55 lbs. per head of the population, the average during a series of years being nearly three (2·93) lbs.† This is a larger average than that obtaining in fourteen of the following countries, the information respecting which, except that relating to the Australasian colonies, has been derived from a paper read by Dr. O. J. Broch before the Statistical Society of Paris, on the 15th June, 1887, and since supplemented by some figures given by M. Paul Leroy-Beaulieu.‡ Attention is called to the very high average consumption of tobacco in Holland and the United States of America :—

AVERAGE ANNUAL CONSUMPTION OF TOBACCO PER HEAD IN VARIOUS COUNTRIES.

	lbs.		lbs.
Holland	6·92	Denmark	2·24
United States	4·40	Canada	2·11
New South Wales	3·53	France	2·05
Queensland	3·49	Sweden	1·87
Western Australia	3·26	Tasmania	1·85
Switzerland	3·24	Russia	1·82
Belgium	3·15	New Zealand	1·75
Germany	3·00	United Kingdom	1·38
Victoria	2·93	South Australia	1·32
Austria-Hungary	2·73	Italy	1·28
Finland	2·73	Spain	1·10
Norway	2·29		

* In the previous year the yield was 70,486 cwt.

† In 1887, the proportion was 2·61 lbs., in 1888, 3·31 lbs., and in 1889, 3·55 lbs. per head.

‡ See *Journal de la Société de Statistique de Paris*, vingt-huitième année, page 237 ; Berger-Levrault, Paris, 1887. The consumption is there given in kilogrammes, which have been turned into lbs., on the assumption that 1 of the former is equal to 2·204 of the latter.

490. Beet for the manufacture of sugar has been as yet only grown in Victoria experimentally, and upon a small scale; but ordinary beet, mangolds, and root crops generally, which have for years past been cultivated to a considerable extent, succeed so well that there is every reason to believe sugar beet could be grown to advantage, did not the low price of sugar, consequent upon the heavy subsidies by which the industry is fostered in several European countries, prevent sugar-making from being carried on at a profit. The following statement, however, of the quantity of beet sugar made annually during the five years 1886 to 1890 in the different European countries in which that product is manufactured may be useful and interesting at the present time:— Beet sugar in European countries.

BEET-ROOT SUGAR PRODUCED IN VARIOUS EUROPEAN COUNTRIES, 1886 TO 1890.*

Countries.	1885-6.	1886-7.	1887-8.	1888-9.	1889-90.
	Tons.	Tons.	Tons.	Tons.	Tons.
Germany... ...	812,011	934,987	943,998	974,949	1,240,088
France	294,668	492,098	386,616	459,390	762,752
Austria-Hungary ...	371,042	516,703	421,842	514,973	738,147
Russia and Poland...	532,057	467,493	434,367	518,068	467,493
Belgium	47,635	78,736	138,518	143,500	196,839
Holland and other countries ...	36,907	49,210	117,375	130,937	137,788
Total ...	2,094,320	2,539,227	2,442,716	2,741,817	3,543,107

491. The manufacture of beet sugar is now carried on in the United States, where, on the authority of the *Statistical Journal of Paris*, the production during the five years ended with 1884 averaged 337,000 tons per annum. According to Mr. McCarty,† two of the largest manufactories are at Philadelphia, and Watsonville (California), and the manufacturers state that within the next five years the United States will export 1,000,000 tons of this sugar annually. Beet sugar in the United States.

492. The following statement of the annual production of cane sugar in most of the countries in which this description of sugar is grown has been derived from various sources:— Cane sugar.

* Taken from a table published in the Report (No. 73) of the Department of Agriculture of the United States, dated May, 1890, page 209. The figures are there given in metric tons of 2,204·6 lbs. These have been turned into Imperial tons of 2,240 lbs.

† The *Annual Statistician*, 1890, page 599. San Francisco and New York.

Cane Sugar Produced Annually in Various Countries.

	Tons.		Tons.
Argentine Republic ...	60,000	Réunion	32,200
Australia	70,000	Sandwich Islands	60,000
Brazil	202,000	United States	110,400
China	100,000	West Indies—British Barbadoes	58,600
Egypt	32,600	„ „ Jamaica	27,000
Guiana (British)	110,800	„ „ Trinidad	65,400
„ (French and Dutch)	8,300	„ „ Other Islands	60,000
India (British)	220,000	„ French Guadaloupe	49,600
Java	316,000	„ „ Martinique	45,000
Manilla	180,600	„ Spanish Cuba ...	598,000
Mexico	30,000	„ „ Porto Rico	77,800
Mauritius	120,200		
Natal	12,000	Total	2,676,500
Peru	30,000		

Consumption of sugar in Victoria and other countries.

493. According to the following figures, Victoria, although not consuming so much sugar per head as three of the other Australasian colonies, would appear to consume much more per head than any European country, the average quantity being 90¾ lbs., or nearly 22 lbs. more per head than the United Kingdom, which consumes more than twice as much per head as any country on the European Continent. It must, however, be remembered that in Victoria 15 million pounds of sugar annually, or nearly 15 lbs. per head, are used in the manufacture of beer, which is very much more than many countries consume altogether:—

Average Annual Consumption of Sugar (Cane and Beet) per Head in Various Countries.*

	lbs.		lbs.
New Zealand	118·77	Sweden	17·52
South Australia	102·11	Belgium	15·74
Western Australia ...	93·51	Germany	15·01
Victoria	90·75	Austria-Hungary ...	13·23
Tasmania	90·49	Norway	11·37
United Kingdom ...	68·99	Finland	11·22†
Queensland	62·93	Portugal	9·56
New South Wales ...	60·95	Roumania	7·71
Argentine Republic ...	50·04	Russia	7·69
Denmark	29·69	Spain	5·11
Holland	28·37	Servia	4·41
Switzerland	22·81	Italy	3·20
France	22·61		

Vines.

494. In 1890-91 the area under vines (20,686 acres) exceeded that returned in 1889-90 by 5,024 acres, and was much larger than in any previous year. The quantity of wine returned was 2,008,493 gallons,

* For countries out of Australasia, see Dr. Broch's paper, page 233, there given in kilogrammes, each equal to 2·204 lbs.

† Mr. K. F. Ignatius, of Helsingfors, in the *Statistical Journal of Paris* for February, 1889, page 72, points out that Dr. Broch has understated the consumption of sugar in Finland, by assuming that a leiviskâ is the equivalent of a kilogramme; whereas the former is equal to 8½ times the latter. Therefore the average consumption of sugar per head in Finland is 11·22 lbs. as here stated, instead of 1·32 lbs. as stated by Dr. Broch and quoted in the issue of this work for 1887-8, Volume II., paragraph 1,145.

or more than that in 1889-90 by nearly 430,000 gallons, and was also much larger than that in any previous year. The wine industry received a temporary check some years since, in consequence of an outbreak of the disease called *phylloxera vastatrix*, but this was found to be confined to one district in the colony (Geelong), where it was promptly stamped out by the eradication of all vines for a distance ranging from 20 to 30 miles from the centre of that district. Replanting has not yet been allowed, as investigation from time to time showed that the insects were present among the vine rootlets which still remained in the ground. A careful search, however, made quite recently, has failed to discover any insects, and it may therefore be assumed that the pest has been exterminated. An account of the visitation of the phylloxera in Victoria, and of the measures taken for its suppression, will be found in the *Victorian Year-Book*, 1888-9.*

Phylloxera in New South Wales.

495. Several years since an outbreak of phylloxera occured in the Camden district of New South Wales. The disease soon spread and extended into the district of Seven Hills. At an early period the Government of Victoria urged the Government of New South Wales to take steps to prevent the phylloxera from spreading, and an Act was accordingly passed with that object. This Act having been found to be ineffective, an amending Act was passed, with the result that the work of destruction of the diseased vineyards was proceeded with. The total area found to be infected was 54a. 0r. 34p., viz.:—31a. 2r. 33p. in the Camden district and 22a. 2r. 1p. in the Seven Hills district. The vines have been cut down and burnt, and the roots have been taken out and also burnt; the ground has been trenched and any particles of root found were destroyed by fire. It is alleged that no trace of phylloxera can now be found in the vineyards dealt with.

Phylloxera in France and other countries.

496. The phylloxera undoubtedly came originally from the United States, where it was first discovered in 1854 by Mr. Asa Fitch upon some vines in the State of New York. It did not, however, spread much until 1863, when it made its appearance in France, and rapidly extended over the vineyards of that country. It is calculated by M. François Bernard that vineyards covering 1,000,000 hectares (2,470,000 acres) have been entirely destroyed by it, and that 200,000 hectares (494,000 acres) in addition are doomed to a like fate; moreover, large areas not yet invaded by the disease are in imminent danger of being so. The disease reached Austria-Hungary in 1875, Australia in 1877, Italy in 1879, the Crimea and Bessarabia in 1880, Turkey and Algeria in 1885, and the Cape of Good Hope in 1886.

* Volume II., paragraph 478.

In the United States the ravages of the phylloxera were for a long time confined to the country situated to the east of the Rocky Mountains, but the insect has now penetrated to the westward, and attacked the vineyards of California. Persistent efforts have been made in France to cope with the evil, and numerous so-called "specifics" have been tried. Vines, moreover, have been extensively uprooted and replaced by vines of other species, which it is hoped may prove impervious to the attacks of the insects. These measures appear to have been attended with some success, as the wine-crop which, from an average of 1,200,000,000 gallons prior to the existence of the phylloxera, had fallen to 600,000,000 gallons in 1885, rose to 800,000,000 gallons in 1889.

Wine production in various countries.

497. The following is a statement of the area under vines, and the quantity of wine produced annually in the various wine producing countries of the world. The figures have been partly taken from a paper entitled *Statistique Vinicole Universelle*, read before the Statistical Society of Paris,* on the 10th August, 1889, by M. François Bernard:—

ANNUAL PRODUCTION OF WINE IN VARIOUS COUNTRIES.

Country.	Year.	Area under Vines.	Wine Produced. (000's omitted.)
		Acres.	Gallons.
Algeria	1888	217,716	72,073,
Australasia	1888-9	27,046	2,692,
Austria-Hungary...	1888	1,562,127	277,379,
Azores, Canaries, Madeira	...	...	3,300,
Cape of Good Hope	1888	...	4,491,
Chile and La Plata	...	...	44,000,
France	1889	4,801,680	809,512,
Germany	1886	180,310	99,000,
Greece	1888	185,250	38,720,
Holland	1885	...	81,994,
Italy	1882-1888	4,759,275	607,838,
Portugal	1887	503,880	94,160,
Roumania	1886	253,629	33,000,
Russia	...	...	66,000,
Servia	...	...	44,000,
Spain	...	4,310,404	350,000,
Switzerland	...	110,656	24,200,
Tunis	1888	8,151	308,
Turkey and Cyprus	...	222,300	57,200,
United States	1887	98,800	33,000,
Total ...	...	...	2,742,867,

* See Journal of that Society for 1889, page 257. The figures are there given in hectares and hectolitres, the former of which have been reduced to acres, on the assumption that 1 hectare is equivalent to 2·47 acres, and the latter to gallons, on the assumption that 1 hectolitre is equivalent to 22 gallons.

Wine consumed in various countries.

498. The wine made in Victoria, added to that imported after deducting that exported, amounts in the average to rather over a gallon annually per head. This shows a larger consumption of wine in this colony than in the United Kingdom, where it is less than half a gallon per head, but smaller than that in Germany, Switzerland, Austria-Hungary, and France, the wine consumption in the last named of which amounts to as much as 16½ gallons per head. The following are the figures for these and some other countries :—

ANNUAL CONSUMPTION OF WINE PER HEAD IN VARIOUS COUNTRIES.

	Gallons.		Gallons.
France	16·52	Queensland	·69
Austria-Hungary ...	4·84	Holland	·49
Western Australia ...	2·52	United Kingdom	·43
Switzerland	2·11	United States	·39
South Australia	1·47	New Zealand	·27
Germany	1·32	Tasmania	·24
Victoria	1·01	Sweden	·20
New South Wales ...	·83	Canada	·14

Exports of tea from various countries.

499. No attempt has yet been made to grow tea in Victoria for commercial purposes, although the tea plant flourishes in gardens around Melbourne, and the Government Botanist has given it as his opinion that many parts of the colony—especially the fern tree gullies—are well suited for its cultivation. The following statement, taken from *Mulhall's Dictionary of Statistics*,* shows the average annual exportation of tea from various countries during the two years 1887 and 1888 :—

TEA EXPORTED ANNUALLY FROM VARIOUS COUNTRIES.

	Millions of lbs.
China	290†
India	90
Japan	40
Ceylon	19
Paraguay	10
Java	7
Total	456

Consumption of tea in various countries.

500. The following figures showing the annual consumption of tea in various countries have been gathered from the best authorities :—

* Page 566, Routledge & Sons Limited, London, 1891.

† In 1889 the exports of tea from China were 2,049,083 piculs, amounting, on the assumption hat a picul is equal to 133⅓ lbs., to 273,211,067 lbs.

Annual Consumption of Tea per Head in Various Countries.

	Annual Consumption of Tea per Head. lbs.		Annual Consumption of Tea per Head. lbs.
Western Australia ...	10·70	Russia	·61
Victoria	10·01	Denmark	·37
Queensland	8·96	Persia	·13
Australia	8·68	Portugal	·12
New South Wales ...	7·55	Switzerland	·10
South Australia ...	7·24	Norway	·09
New Zealand	7·23	Germany	·07
Tasmania	5·35	Belgium	·03
United Kingdom ...	4·70	Sweden	·03
Canada	3·69	France	·03
United States	1·40	Austria-Hungary ...	·02
Holland	1·16	Spain	·01

Consumption of tea in Australasia and elsewhere.

501. From these figures it appears that the average consumption of tea is much larger in British than in Foreign Countries, and that the Australasian colonies stand at the head of the list with an annual consumption varying from $5\frac{1}{3}$ to $10\frac{3}{4}$lbs. per head of the population. It will also be observed that after British dominions the United States is the largest tea consumer, and next to it Holland, after which no country has so large a consumption as 1lb. per head.

Gardens and orchards.

502. No return is made of the nature of the crops grown or the quantity of produce raised in gardens and orchards. The following, however, is the extent of land returned under this description of culture in the last two years. Market gardens are included as well as gardens attached to farms, but not gardens or orchards kept merely for pleasure or private use :—

Land under Gardens and Orchards, 1890 and 1891.

	Acres.
1889-90	29,243
1890-91	33,864
Increase	4,621

Ensilage.

503. Ensilage was returned as having been made on 225 farms situated in 73 shires and 3 boroughs in 1890-91, the principal crops used being maize, oats, and grass, but returns were obtained besides of ensilage made from rye, peas, beans, lucerne, carrots, cabbage, thistles, weeds, and "orchard rubbish." The total quantity made was set down as 9,878 tons, as against 8,294 tons in the previous year. The largest returns of ensilage were obtained from the following shires:—Lilydale, where 2,524 tons were made on 7 farms; Marong, 836 tons on 6; Buln Buln, 689 tons on 16; Gordon, 440 tons on 13;

Lowan, 365 tons on 19; Benalla, 293 tons on 7; Rodney, 269 tons on 8; Korong, 255 tons on 7; Traralgon, 215 tons on 5; Arapiles, 200 tons on 1 farm. The number and capacity of the silos were not given.

504. Land in fallow is included in the area under tillage. The number of acres in this condition in 1891 was 385,572, or 5,871 more than in the previous year. Land in fallow.

505. The extent of land subjected to irrigation in the season under notice, although larger than in 1889-90 or 1887-8, was less in the other three years named in the following table. The extent fluctuates from year to year, and is doubtless smaller in seasons of abundant rainfall than it is in years of drought:— Irrigation, 1886 to 1891.

IRRIGATION, 1885-6 TO 1890-91.

Crops subjected to Irrigation.	Number of Acres subjected to Irrigation.					
	1885-6.	1886-7.	1887-8.	1888-9.	1889-90.	1890-91.
Wheat	8,109	14,034	7,206	16,403	60	2,916
Oats	502	1,416	297	1,899	58	1,304
Barley	237	349	...	863	27	218
Maize	10	1	...	75	37	22
Peas and Beans ...	11	3	1	2	...	11
Potatoes	22	93	12	46	98	85
Turnips	5	7	1	...	5	1
Mangel-wurzel ...	13	6	1	9	3	1
Beet, Carrots, etc. ...	15	11	...	7	11	9
Onions	...	1	1	...	...	4
Chicory	28	30	20	30	31	18
Grass and Clover seeds ...	...	...	...	...	...	8
Hay	3,939	4,633	1,172	4,004	58	1,175
Green Forage... ...	89	155	37	483	123	315
Artificial Grasses ...	206	251	108	171	570	1,866
Hops	254	60	48	116	387	215
Tobacco	...	52	...	...	...	...
Pumpkins	...	4	...	...	...	...
Tomatoes	2	2	1	...	...	...
Vines {Productive}	...	56	37	55	34	340
Vines {Non-productive}						111
Gardens and Orchards ...	37	178	51	411	596	882
Total ...	13,479	21,342	8,993	24,574	2,098	9,501

506. In 46 municipalities, in 1890-91, certain crops covered 161,950 acres, of which 9,501 acres, or nearly 6 per cent., were subjected to irrigation. The following table shows the extent of land under these crops, and their gross and average produce; the tillage and produce on unirrigated and on irrigated land being distinguished:— Crops irrigated.

Irrigation in Certain Municipalities, 1890-91.

Crops.	In Municipalities practising Irrigation.					
	Extent under Crop on Land—		Gross Produce on Land—		Produce per Acre on Land—	
	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.	Unirrigated.	Irrigated.
Grain Crops.	acres.	acres.	bushels.	bushels.	bushels.	bushels.
Wheat	52,647	2,916	594,050	34,359	11·28	11·78
Oats	6,169	1,304	147,709	30,373	23·94	23·29
Barley, malting...	1,898	205	23,675	2,456	12·47	11·98
„ other ...	230	13	3,534	280	15·36	21·54
Maize	599	22	20,533	1,630	34·28	74·09
Peas and Beans ..	192	11	3,658	385	19·05	35·00
Root Crops.	acres.	acres.	tons.	tons.	tons.	tons.
Potatoes... ...	606	85	2,344	481	3·87	5·66
Mangel-wurzel ...	7	1	110	10	15·72	10·00
Carrots	306*	9	3,883*	174	12·69	19·33
Onions	14	4	90	36	6·43	9·00
Chicory	240*	18	1,679*	180	7·00	10·00
Grass and Clover Seeds	62	8	325	120	5·24	15·00
Turnips	392*	1	4,479*	20	11·43	20·00
Hay, Grass, etc.	acres.	acres.	tons.	tons.	tons.	tons.
Hay	74,512	1,175	31,903	1,602	1·30	1·36
Green Forage ...	707	315	...	...	...	...
Artificial Grasses	8,063	1,866	...	...	...	...
Other Tillage.	acres.	acres.	cwt.	cwt.	cwt.	cwt.
Hops	245	215	2,026	2,884	8·27	13·41
Vines, productive	678	111	11,367	1,152	16·77	10·38
„ non-productive	573	340	...	...	...	...
Market Gardens	742	112	...	...	...	...
Gardens and Orchards	3,567	770	...	...	...	...

Yield of crops on irrigated land.

507. An examination of the last two columns will show that irrigation was attended with beneficial results in the case of all the crops named in the table except oats, malting barley, mangel-wurzel, and grapes. The improved yield of many of the other crops was considerable; thus, whilst in certain shires the yield per acre of maize was $34\frac{1}{4}$ bushels; barley (not malting), $15\frac{1}{3}$ bushels; peas and beans, 19 bushels; turnips, $11\frac{2}{5}$ tons; carrots, $12\frac{3}{5}$ tons; potatoes, $3\frac{4}{5}$ tons; chicory, 7 tons; and hops, $8\frac{1}{4}$ cwt., on unirrigated land; in the same shires on irrigated land the yield per acre of maize was 74 bushels; barley (not malting), $21\frac{1}{2}$ bushels; peas and

* There being no crop of this kind returned as grown on unirrigated land in the shires in which irrigation was practised, these figures relate to other parts of the colony.

beans, 35 bushels; turnips, 20 tons; carrots, 19⅓ tons; potatoes, 5⅗ tons; chicory, 10 tons; and hops, 13⅖ cwt. The yield per acre of grapes was 16¾ cwt. on unirrigated, but only 10⅓ cwt. on irrigated land. This is contrary to the experience of previous years, when the crop of grapes obtained from irrigated land has always been the heavier. In the past season the proportion of wine to grapes was larger by over a gallon to the cwt. on irrigated than on unirrigated land, the proportions being 6·92 gallons to the cwt. of grapes grown on the former, and 5·80 gallons to the cwt. of grapes grown on the latter.

508. The *Water Act* 1890 (54 Vict. No. 1,156) repealed all previous Acts for the conservation, management, and distribution of water, and consolidated their provisions. It is divided into seven parts as follow* :— *Water Act* 1890.

PART I.—PRELIMINARY.

Repeals to the extent indicated the operation of previous Acts mentioned in the first schedule of the *Water Act*.

PART II.—WATER SUPPLY BY WATERWORKS TRUSTS.

Waterworks trusts are constituted for the purpose of controlling the stock and domestic supply within the area of their respective districts, and are distinct from irrigation trusts in the manner of their constitution and the duties they are called on to administer.

They are appointed by the Governor-in-Council upon the application of the municipal councillors of one or more municipal districts, and are bodies corporate. The commissioners are elected by the municipal councils whose districts are directly benefited by the proposed waterworks, with an additional commissioner appointed by the Governor-in-Council.

Whenever a waterworks district is wholly within one municipality, its council may be appointed in a body by the Governor-in-Council, together with one or more persons not members of such municipal council. One or more ridings of a municipal district may also be formed into a waterworks district. Machinery for the election of commissioners, filling up vacancies in their number, and conduct of business is provided. Any two or more of these waterworks districts may be united on the application of the waterworks trusts of all districts affected, and provision is made for the appointment of officers and servants.

The powers and duties of the trusts and persons within their districts are defined, and power is also given to hold, purchase, mortgage, or lease property and to effect loans and levy rates for the maintenance of works and payment of interest; also to form a sinking fund for the repayment of principal, the formation of which may be deferred for five years by Governor-in-Council.

Any city, town, borough, or populous place comprising the whole or any part of a waterworks district, may, by Order in Council, be proclaimed an urban district, and special provision is made for reticulating the streets, levying rates, and making regulations for governance of the trust's business.

PART III.—WATER SUPPLY FOR IRRIGATION AND MANUFACTURING PURPOSES.

For the purposes of this part of the Act, the right to use the waters of the rivers, streams, etc., of the colony shall be deemed to be vested in the Crown until the contrary is proved by establishing any other right.

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* This account was written for this work by an officer of the Victorian Water Supply Department.

Any municipal council or waterworks trusts, or any two or more together of any such councils or trusts, or the majority in number of the ratepayers in any proposed irrigation and water supply district, or the majority in numbers of landowners therein, if the latter hold at least half the land in the proposed district, may petition the Governor-in-Council to constitute an irrigation and water supply district. Upon receipt of this petition, careful departmental investigation is made into the merits of the scheme, and a report furnished. The Minister may then settle particulars of scheme by declaration in *Government Gazette*. Ample time and publicity are given for adverse petitions or objections, and directions are laid down for their careful consideration, and for carrying out the wishes of the majority of the landowners. Should the scheme or any amendment thereof after minute investigation appear feasible, and a petition be lodged from the majority of landowners owning at least half the land in the proposed district, the Governor-in-Council may approve of the appointment of an irrigation and water supply trust. Provision is made for the constitution of such trusts, which are bodies corporate, and the constituting Order-in-Council determines the boundaries of the trust's district, assigns a corporate name, describes the scheme and principal works to be constructed, allots quantity of water and source of supply, fixes rates of payment by trusts for water, states proposed expenditure on works, declares the amount of Government loan to be advanced, determines the number, period of office, etc., of trust commissioners, declares the rating powers, makes provision for certain other minor matters.

Subsequent sections provide for action to be taken where trusts have common headworks; for trusts being charged proportionately only for loans on joint works; that municipal councillors may be commissioners, or that the latter may be elected by the landowners; provides for the creation and management of urban divisions in irrigation and water supply districts; also enacts that the Governor-in-Council may declare any irrigation district, not exceeding 10,000 acres in extent, a special district with enlarged franchise.

Machinery is provided for the election of commissioners, the conduct of business, and control of officers.

The rights and duties of trusts are defined, and the property to be held by them particularised. Power is conferred upon municipalities to sell waterworks to trusts, and to the latter to exchange land. Trust works are exempted from municipal rates.

Power is given to confer certain limited powers on private persons to construct waterworks.

Provision is made for the granting of pumping leases, licenses for water easements, and their revocation.

The Board of Land and Works has power to construct and maintain national works for the conservation of water and its sale to the trusts. Directions are laid down that the rivers and streams of Victoria shall be systematically gauged, and that water-boring shall not be neglected. The general powers and rights of the board as regards national works are defined.

Provision is made for the supply of water to and by trusts, who, when the quantity is insufficient, may be supplied proportionately from national works, and may so supply their constituents with water for any period not exceeding fourteen years.

The rating and borrowing powers of the trusts are defined, and the machinery therefor provided. The payment of interest upon Government loans, or for water, may be deferred for five years. The Supreme Court may, upon the petition of the senior Audit Commissioner, appoint a receiver in the event of a trust making default, and in such case such receiver would exercise the same functions as the trust, under the direction of the Supreme Court. Provision is made for the formation of a sinking fund to pay off the Government loan, which may, however, be postponed for twelve years by Governor-in-Council.

Compensation for loss or damage caused by violation of riparian or other rights to easements, or for injury, loss, or damage by flooding, may be paid if claimed within two years, and machinery is provided for settlement of disputes.

Penalties for offences named are stated.

The Minister has power to refer differences to a County Court judge, and, finally, the Governor-in-Council may make additional orders, which must, however, be laid before Parliament.

PART IV.—DRAINAGE OF THE LAND FOR THE PURPOSE OF ITS IMPROVEMENT.

Provides that the Governor-in-Council may extend the powers of irrigation and water supply trusts to the drainage of land for its improvement, subject to the requirements and restrictions laid down in such part.

PART V.

Deals with the water supply to towns by the Board of Land and Works.
Division 1 deals with the water supply to Melbourne and Geelong.
Division 2 gives the Board of Land and Works power to construct waterworks for the supply of towns mentioned in the seventh schedule of the Act, and provides the necessary machinery for supply, rating, inflicting penalties for offences enumerated, sale or leasing of works, and other necessary matters.

PART VI.—SUPPLY OF TOWNS BY LOCAL GOVERNING BODIES.

Provides necessary machinery and (in Division 2) gives special directions for the appointment of Ballarat Water Commissioners, their election, payment, term of office, meetings, officers, etc.; the powers and duties of the Ballarat Commissioners, and (in Division 3) of them and local governing bodies to make regulations is laid down.

PART VII.

Contains general provisions as to penalties and procedure.

Irrigation and Water Supply Trusts.

509. On the 30th June, 1891, there were 28 Irrigation and Water Supply Trusts—many of which draw their main supply of water from the National Works—with jurisdiction over 2,711,949 acres of land, having an irrigable area of 1,818,304 acres, of which 353,662 acres are capable of being irrigated annually from the works constructed or in course of construction. The present value of the irrigable lands, on a low basis of calculation, is set down as £6,888,076, and the annual rateable value of the same as £295,932. Of the 28 schemes 3 have been completed, 19 are in progress, and 6 had not been commenced. Of those completed or in progress, 13 are reported to be satisfactory. The aggregate borrowing power of the Trusts is limited to £1,450,958, of which the Government have agreed to advance £1,284,147, the balance to be obtained in the open market; whilst the amount actually advanced to the 30th June, 1891, was £679,682. There are, at present, two storage reservoirs under the control of Trusts, viz., the Wartook Reservoir, near Horsham, with a capacity of 1,035 million cubic feet, and Murphy's Lake, near Kerang, with one of 51 million cubic feet.

National Irrigation Works.

510. The more important irrigation works, or those connected with the principal rivers which will form the main supply in some cases for several local schemes, are undertaken by, and are under, the entire control of the State. These are known by the name of National Works. The total expenditure from loans to the 30th June 1891, on three of the principal works, in which considerable progress had been made, was about £552,600. The following is an account of such works as given in the last report of the Victorian Water Supply

Department, and of the progress already made in their construction:—

GOULBURN NATIONAL WORKS.

General Description.—The National Irrigation Works constructed and proposed in the Goulburn District are the most important of the schemes contemplated by the Government, and are briefly as follow :—

1. A weir on the Goulburn River, designed to raise the level of surface of water to a sufficient height to command the irrigation districts by gravitation.

2. Twenty-four miles of main channel westwards, of which fifteen miles are constructed to convey 100,000 cubic feet of water per minute to the proposed Waranga Reservoir.

3. The proposed Waranga Reservoir, to impound about 7,500,000,000 cubic feet of water, available for irrigation.

4. Forty and a half miles of main channel, from the proposed Waranga Reservoir to the Campaspe River, to carry 50,000 cubic feet of water at the head and about 25,000 cubic feet per minute across the river.

5. Thirty-three miles of main channel on the east side of the Goulburn River, to convey 20,000 cubic feet of water per minute.

Goulburn Weir.—The site was selected as being the nearest point to the Irrigation District at which a rock foundation was obtainable near the surface suitable for carrying a masonry structure. The summer level of the river is raised 45 feet by the weir, viz., from 363·00 to 408·00 R.L., the depth of water from raised water-level to the bed of the river being 50 feet. The weir is of concrete, composed of Portland cement, sand, and broken stone, backed with granite blocks in steps. The lower portion across the channel-way was constructed in four sections within cofferdams; six tunnels, each of 44 square feet, carrying the ordinary flow of the river while the superstructure was in progress. These tunnels are closed at the face by cast-iron gates, which were permanently shut down on the 11th December, 1890, and the river has since been flowing over the weir. The water-way over the weir for the passage of floods is occupied by 21 gates, each 20 feet wide and 10 feet high, lowering into recesses or chambers in the body of the structure as may be required to accommodate the flow of the river, and to maintain the water-level as far as possible at 408·00 R.L. To lower the gates into chambers was considered the best arrangement with regard to the conditions of the river, and to keep the works as compact as possible. The flood conditions might have been modified by increasing the depth or length of flood water-way, but the provision made was considered adequate, sufficient land being taken to cover the heading. The power for working the flood-gates is obtained from three 30½-in. "Leffel" turbines. Hand-gearing is also provided over each gate. The turbines can be worked together or separately, and any turbine can be brought into gear with any gate or gates. The head under which the turbines will be worked will vary from 3 feet to 13 feet, according to the state of the river below the weir, giving from 3 horse-power and 78 revolutions per minute, to 27·3 horse-power and 163 revolutions per minute, according to the varying conditions. An electric lighting plant of five arc lamps, driven by a 23-in. "Leffel" turbine, is provided for night-work.

The weir is now entirely finished, as well as some protection works it was found desirable to add in the river bed immediately below. A heavy flood occurred in the middle of July, 1891, the volume being about 1,423,000 cubic feet per minute. The works were found in good condition after the floods subsided.

The offtake channels have head-gates, each 10 feet by 7 feet, pivoted vertically, and worked by worm and worm-wheel gearing. The western offtake has 14 and the eastern 4 of these gates.

Western channel.—The general section is 110 feet wide at bed, with slopes of 1½ to 1 in cutting and 2 to 1 where embanked. Depressions are crossed by timber flumes, five in number, and of an aggegate length of about fifteen chains on the upper seven miles of the fifteen miles constructed. Syphons for surface drainage consist of wells of brick and earthenware pipes jointed with cement. Relief works are provided at Flume No. 5., near the seventh mile, to admit of the channel being emptied quickly in event of a breach. Bridges are at each road-crossing. The channel is designed to carry 7 feet depth of water, on a grade of 6 inches per mile,

and is calculated to convey fully 100,000 cubic feet per minute. Two offtakes are provided on the fifteen miles now constructed, one at the eighth and another near the fifteenth mile. These consist of a series of gates across the channel to maintain the full depth of water, the supplies being delivered over measuring weirs.

The channel is excavated to a depth to provide sufficient material for embankments, where practicable. Embankments are made at least 15 feet wide on top, and not less than 2½ feet above top water-level of channel. Overflow escapes are provided at the flumes and at two other points where the channel is close to the river.

On the 14th December, 1890, or three days after the gates of the weir had been shut down, the water level above the weir rose to the beds of the offtake channels, and was allowed to flow along the course of the western channel for the seven miles which had then been completed, to an accommodation off-take for a supply to the main channel of the Echuca and Waranga Trust. The channel has since been almost completed to the fifteenth mile, where the Rodney Irrigation Trust's principal offtake will be, and it is fully expected that the Rodney Trust and the Echuca and Waranga Waterworks Trust will obtain a continuous supply from national works next season.

The permanent surveys beyond the proposed Waranga Reservoir are completed to the Wanalta Creek, and a trial survey has been carried on to the Campaspe River. The country to the north of the channel line, from the meridian of Moora to Lake Cooper, is much flooded in the winter season, and it may be advisable to divert the flood water to Lake Cooper and embank the lake so as to convert it into a storage, if the cost be not prohibitive. Probably a scheme for the diversion of part of the flood water may be found to be the best, in the interest of the irrigators as well as of the owners of lands affected by the floods. Extensive trial survey is being made to test the question.

Eastern Channel.—Nothing further has been done in connexion with the survey of the national channel on the east side of the Goulburn River during the past year.

Cost of Works.—The Goulburn Weir has cost about £100,000, and the amount paid for compensation for land, and construction of roads and bridges in connexion therewith, will be about of equal amounts. The cost of channel works constructed is about £150,000, and land required for same about £15,000. To these sums about £10,000 has to be added for surveys, engineering, and sundries, making the total cost of the completed works about £375,000.

Loddon District.

The regulating reservoir for the Loddon River is situated about half-a-mile above Laanecoorie. It is a compound structure of concrete masonry, with automatic tilting gates, the extension on the left bank being in the form of an earthen dam, with a berm or banquette in rear, of materials not liable to scour. The capacity of the reservoir, to the full supply level, is 610,000,000 of cubic feet, equal to 3,812,000,000 of gallons, or rather more than 25 per cent. greater than the Malmsbury reservoir. All the work is completed with the exception of the automatic gates, foot-bridge, and gear for lifting the valves. It is expected that these will be erected by the end of November, 1891. The greater part is constructed ready for erection; the delay has been caused by some of the iron having to be specially imported. On the 15th July, 1891, about one foot of water was running over the crest of the weir. The reservoir up to the masonry crest, and exclusive of the flood-gates, contains about 351,000,000 of cubic feet. The expenditure to 30th June, 1891—all on the Laanecoorie Weir—was £100,846, viz., £63,313 on works, £29,258 on land compensation, £4,217 on roads and bridges, and £4,058 on engineering expenses. The estimated cost of the weir which has since been completed is £130,500.

Kow Swamp.

It having been found inexpedient for various reasons to push these works forward as rapidly as was at one time intended, the anticipation that the whole would be completed early in the winter of 1891 has not been realized. About one-half of the scheme is, however, practically finished, and a partial supply will be available during the approaching summer. The expenditure on this scheme to 30th June, 1891, has been £76,727, viz., £71,868 on works, £526 on land, and £4,333 on engineering management.

Waterworks and water-works trusts.

511. There were 46 Waterworks Trusts in existence on the 30th June, 1891, including five which had been recently formed, but excluding two which had been transferred during the year to Irrigation Trusts. The Waterworks Trusts consist of 12 rural and 34 urban trusts, 6 of the former also providing urban supplies to 10 towns; several of them are almost identical with the municipal councils. The rural schemes have numerous weirs, dams, and tanks, supplying an area of 4,034,200 acres, of an annual rateable value of £590,000; whilst the estimated cost of the works was £456,982. The urban works completed have a storage capacity of over 297 million gallons, and were estimated to cost £350,738; they supply a population of 46,800, who possess property of the annual rateable value of £260,000. The amount of loans authorized to be advanced to these bodies was £794,424, of which £716,088 had been paid up to the 30th June, 1891. The interest due, but remaining unpaid at that date, was £45,494; but £10,976 of this had only just become due, and £7,519 was paid within the subsequent three months. Of the total amount, as much as £30,000 was due on account of only three trusts. From the report furnished by the inspecting engineer, it appears that of the rural works 3 were in a satisfactory, 5 in a fair, 3 in an unsatisfactory, and 1 in a most unsatisfactory condition; whilst of 24 urban Trusts, which had completed their works, as many as 22 were in a satisfactory condition, and had paid all interest on loans at the date of the report of the Minister for the year 1890-91.

Waterworks under Government.

512. Prior to the constitution of the Waterworks Trusts extensive works for the storage and supply of water for domestic, mining, and, to a limited extent, for irrigation purposes, had been constructed by the Government and by Local Bodies in various parts of the colony. The most important of these is the Yan Yean reservoir, together with the subsidiary reservoirs at Jack's Creek, Morang, Preston, Essendon, Caulfield, and Kew, by means of which Melbourne is provided with a supply of fresh water at a high pressure. The Yan Yean is an artificial lake situated 22 miles from the city, and 595 feet above its level, which covers an area of 1,360 acres, or rather more than two square miles, and has a drainage area of 56,000 acres. The length of aqueduct and mains from this reservoir is 213 miles, and of reticulation pipes (under 12-inch diameter) 980 miles.* To meet the increased demand for water consequent upon the growth of the city and suburbs, a new channel has been formed for the

* For an interesting account of this reservoir by the Inspector-General of Public Works (Mr. W. Davidson, C.E.), see *Victorian Year-Book*, 1889-90, vol. II., paragraph 515.

purpose of turning into the reservoir other considerable streams of pure water, by which means all fear of the supply becoming exhausted in seasons of drought is at an end. The following table contains a list of such of these works as were under Government control in 1890; also a statement of the estimated storage capacity, and the total cost of each scheme. The Melbourne Waterworks have since been transferred to the newly constituted Melbourne and Metropolitan Board of Works:—

WATERWORKS UNDER GOVERNMENT CONTROL.

Scheme—Name of Town or District supplied.	Reservoir or Source of Supply.		Cost.
	Where situated.	Storage Capacity.	
		Gallons.	£
Melbourne and Suburbs*	Yan Yean	6,400,000,000	3,378,247
	Jack's Creek ...	60,000,000	
	Morang (pipe head) ...	3,000,000	
	Preston (storage) ...	15,000,000	
	Essendon (storage 1) ...	6,000,000	
	,, (,, 2) ...	1,000,000	
	Caulfield (,,) ...	10,000,000	
	Kew	3,000,000	
COLIBAN SCHEME.			
Taradale ...	Malmsbury	3,255,000,000	1,069,255
	Taradale	65,000	
Castlemaine and Chewton	Expedition Pass ...	120,000,000	
	Red Hill	1,250,000	
	Old Post Office Hill ...	2,000,000	
	Barker's Creek ...	629,135,000	
	Specimen Gully ...	2,618,000	
Fryerstown	Crocodile Gully ...	5,407,000	
Maldon	Green Gully	1,500,000	
Bendigo ...	Big Hill	68,000,000	
	Big Hill Tank ...	300,000	
	Crusoe Valley ...	320,000,000	
	New Chum Tank ...	23,000	
	Solomon's Gully ...	1,250,000	
Bendigo District	Spring Gully ...	150,000,000	
	Upper Grassy Flat ...	58,860,000	
	Lower Grassy Flat ...	26,800,000	
Eaglehawk	Sparrow Hawk ...	1,500,000	
Raywood ...	Lightning Hill ...	7,000,000	
	Raywood	2,500,000	
Sebastian	Sebastian	239,200	
Lockwood and Marong ...	Green Gully	3,500,000	
Geelong and suburbs	Upper Stony Creek ...	354,000,000	357,338
	Lower Stony Creek ...	143,000,000	
	Anakie (pipe head) ...	900,000	
	Lovely Banks ...	6,000,000	
	Newtown Tank ...	500,000	
	Total	11,659,347,200	4,804,840

* Now under the control of the Melbourne and Metropolitan Board of Works.

Revenue and expenditure of Melbourne

513. The total expenditure to the 30th June, 1891, on the construction of the Melbourne Water Works was £3,378,247. The gross revenue received since the opening of the works at the end of 1857* has amounted to £3,150,055, whilst the expenses of maintenance and management amounted to only £420,834. During 1890-91 the revenue of the waterworks amounted to £200,745 as against £193,274 in the previous year; and the expenditure on maintenance and management to £27,574, as against £26,128 in the previous year. The net revenue in 1890-91 was thus £173,171, being equivalent to 5·34 per cent. of the mean capital cost,† as compared with £167,146, or 5·73 per cent. in 1889-90. A reference to a previous table‡ will show that the loans borrowed (£2,122,866) for the construction of the works now bear an average nominal rate of only 3·93 per cent.

Water consumption in towns.

514. The average daily consumption of water per head throughout the year in the districts reached by the water supply of Melbourne and suburbs is 59§ gallons, or more than the average daily consumption in eight, and less than in eight of the following towns:—

WATER CONSUMPTION IN VARIOUS TOWNS.

	Average daily consumption of water, per head‖ (gallons).		Average daily‖ consumption of water, per head (gallons).
Rome	160	Paris	36
Marseilles	158	London	31
Washington	143	Sydney	25
Chicago	102	Dresden	15
Ottawa	102	Naples	15
Boston	73	Berlin	13
New York	61	Madrid	3
Hobart ...	60	Calcutta	2¶
Melbourne	59		

Coliban scheme.

515. The Coliban Scheme provides water for domestic and mining purposes, as well as for irrigation to a limited extent, to the Bendigo and Castlemaine districts. The chief reservoir of this scheme, which is near Malmsbury, has a capacity of 3,255 million gallons. The cost of the works to 30th June, 1891, was £1,069,255; whilst the gross revenue during the year 1890-91 was £21,250; and the expenses of maintenance and supervision, £10,502. The net revenue

* Although the works were commenced in 1853, they were not opened until the 31st December, 1857. The information in this paragraph is compiled from a statement furnished by the Melbourne and Metropolitan Board of Works, which has now assumed control of the works. See paragraph 524, *post*. † Or the mean of the capital cost at the beginning and end of the year.

‡ See table following paragraph 236 in Vol. I.

§ Figures supplied by the Melbourne and Metropolitan Board of Works. Mr. W. Davidson, however, who had charge of the Melbourne Water Supply prior to its being taken over by the Board, sets down the daily consumption at 56 gallons per head.

‖ Figures, except as regards Melbourne, Sydney, and Hobart, taken from Blyth's *Manual of Public Health*, 1890, page 143.

¶ The residents of Calcutta, and probably also of other towns situated on the banks of rivers, use river water in addition to that derived from the house to house supply. Rain water is also largely used where such supply is limited.

was thus £10,748, being equivalent to 1·005 per cent. of the capital cost, as compared with £9,640, or ·901 per cent., in 1889-90; and £9,236, or ·863 per cent., in 1888-9. The deficiency in 1890-91, after allowing interest on the capital cost at the rate of 4½ per cent., was £37,368.

Geelong Waterworks.

516. The Geelong Waterworks provide water for domestic supply to Geelong and suburbs. The chief storage works in this scheme are the Upper and Lower Stony Creek reservoirs, having a capacity of 497 million gallons, and the whole scheme has cost up to the 30th June, 1891, £357,338. The gross revenue for 1890-91 was £10,118, and the cost of maintenance, £3,275. The net revenue was thus £6,843, or 1·915 per cent. of the capital cost, as against £6,487, or 1·815 per cent., in 1889-90, and £6,600, or 1·846 per cent., in 1888-9. After allowing interest on capital at 4½ per cent., the deficiency for 1890-91 was £9,237. It is proposed to transfer these works to a local Trust, and negotiations with that view are now proceeding.

Goldfields reservoirs.

517. There are 24 goldfields reservoirs, having an aggregate capacity of nearly 492 million gallons, the largest, at Beaufort, containing about 86 million gallons. These cost £59,653, and were originally constructed by the Government chiefly for mining purposes. They are for the most part leased to municipal councils at a nominal rental, but it appears that, in many cases, those bodies do not keep them in proper repair. The question of the sale of the works to the municipalities has been under the consideration of Parliament.

Waterworks under Local Bodies.

518. Prior to the establishment of Waterworks Trusts, advances were made from the Government loan account to various municipalities to enable them to construct waterworks for their respective districts—the principal to be gradually repaid into a sinking fund. The number of such municipalities was 22, which possessed 21 reservoirs, having a total capacity of nearly 1,578 million gallons, as well as other sources of supply. The expenditure from loans on these works was £632,802, of which £610,944 remained unpaid on the 30th June, 1891; the works supply a population of about 77,600. The chief of these reservoirs are the Ballarat reservoirs, now under the Ballarat Water Commission, having an aggregate capacity of nearly 842 million gallons. The Gong Gong reservoir alone contains 427 million gallons; the Beechworth reservoir at Lake Kerferd, 191 million gallons; the Clunes reservoir at Newlyn, 207 million gallons; and the Talbot reservoir at Evansford, 200 million gallons.

Capacity and cost of reservoirs.

519. By the following summary of the total storage capacity of reservoirs and the total cost of these and other works for the conservation of water referred to in the forgoing tables and paragraphs, it is shown that the former amounts to over fourteen thousand million gallons, and the latter to over six and one-third millions sterling :—

Capacity of Reservoirs and Cost of Waterworks Schemes.

(*Exclusive of National and other Irrigation Works*).

Waterworks under—	Storage Capacity of Reservoirs.	Cost of Schemes.	Expenditure from Loans to 30th June, 1891.
Government—	Gallons.	£	£
Melbourne	6,498,000,000	3,378,247	1,646,455
Coliban	4,656,947,200	1,069,255	1,069,255
Geelong	504,400,000	357,338	357,338
Goldfields	492,000,000	59,653	Nil.
Local Bodies	1,578,000,000	688,081	632,802
Waterworks Trusts—			
Urban Works* ...	297,000,000	350,738*	716,088
Rural ,, ...	†	456,982	
Total	14,026,347,200	6,360,294	4,421,938

Rainfall in Victoria, 1890.

520. According to the fifth annual general report of the Minister of Water Supply, the average rainfall over the whole surface of Victoria during the year 1890 was 29·20 inches, representing a volume of water of about 40 cubic miles, that for 1889 and 1888 being about 46 and 36 cubic miles respectively. The lowest and highest monthly averages for the year were :—January, 1·1 inch; June, 4·10 inches.

Boring for water.

521. The report of the Victorian Water Supply Department states that four drills were engaged during the year in boring for water, one at Ballyrogan (in the Ararat Shire), and three in the mallee district. At Ballyrogan, the bore commenced in the previous year was completed, and two fresh bores were put down, the bed rock in each case being struck at comparatively shallow depths, without tapping any artesian water. The boring in this locality has been discontinued, and the drill stored. In the mallee, three bores commenced last year were completed, and three fresh bores were commenced. The depth

* Inclusive of works in progress. See also paragraph 511 *ante*.

† Rural works consist mainly of weirs, dams, and tanks.

of the bores varied from 54 to 103 feet at Ballyrogan, and from 60 to 852 feet in the mallee district; in the latter the water tapped was nearly always salt. The total amount expended in 1890-91 was £10,000, but no water of any practical value was tapped. During the last five years, £52,700 has been spent in boring for water.

Chaffey Irrigation colony.

522. The Mildura Irrigation Colony, established by the Messrs. Chaffey under the *Waterworks Construction Encouragement Act* 1886,* which is the most important private irrigation work in Victoria, has been several times referred to in previous issues of the *Victorian Year-Book*. An interesting account of the progress of this settlement, taken from the Fifth Annual Report of the Minister of Water Supply, is published in an appendix to this volume.

Sewerage of Greater Melbourne.

523. Intimately connected with the subject of the water supply of Melbourne is that of its sewerage. Although some years since sewers were constructed under two of the principal streets (Swanston and Elizabeth streets) for the purpose of carrying off the storm and other waters which had previously been allowed to flow along the open street channels, no complete system of sewerage for the metropolitan area has yet been adopted. Recognizing the necessity of making provision for the disposal of the sewage of Melbourne other than that afforded by the Yarra and Saltwater rivers, which had become so polluted as to be a menace to the health of the inhabitants, the Government in 1889 engaged Mr. James Mansergh, C.E., an eminent English engineer who had made the drainage of towns his special study, to make a complete examination of Greater Melbourne, and to formulate a scheme for its efficient drainage. After nearly two months' stay, Mr. Mansergh returned to England, and was long engaged in considering the subject and drawing up his report thereon. That report, which was completed on the 1st August, 1890, and laid before Parliament in the following month, deals with a district around Melbourne, embracing 18 urban municipalities, viz., 8 cities, 5 towns, and 5 boroughs, besides the greater portion of 6 shires, and containing an area of 80,500 acres, and a population of 430,600 inhabitants, whilst the scheme submitted is capable of providing for a future population of nearly 1,700,000. In the course of his investigations Mr. Mansergh came to the conclusion "that there is no spot within a practicable distance of the metropolis where its sewage can be got rid of into its natural outfall—the river or the sea—without being so treated as to

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* 50 Vict. No. 910.

remove the solid impurities which it contains"—*i.e.*, either on land or by chemical treatment. Mr. Mansergh recommends the construction of certain main sewers, the more important of which will convey the sewage to two pumping stations, wherefrom it will be forced to high levels and allowed to flow by gravitation to two sewage farms situated on opposite coasts of Port Phillip Bay, at some distance from the city, where, after the solid matter has been deposited, and rendered fit for use in cultivation, the effluent water will become clarified in percolating through the soil, and ultimately by means of subsoil drainage pipes find its way into the Bay. Mr. Mansergh calculates the capital cost of the scheme within the first eight years at about 5 millions sterling, and the ultimate cost at £5,816,500, and that it would take five years to execute the main works, and at least eight years to completely sewer the whole district. The gross annual charge, including an allowance of £191,651 for repayment of principal and interest in 50 years, is set down at £223,192 at the end of the fifth year, of which at least £81,140 will be defrayed from the water revenue, leaving a net charge of £142,052 to be provided for from the proceeds of a rate of 4·86d.* in the £ levied on all rateable property. It is also estimated that after the payment of the principal in the time stated, the water revenue will alone be sufficient to pay the whole of the working cost.

Sewerage to be undertaken by Melbourne and Metropolitan Board of Works.

524. The proposed scheme of sewerage will be carried out under the direction of the Melbourne and Metropolitan Board of Works.† The district over which the Board exercises control consists of 18 cities, towns, and boroughs, and 6 shires, embracing a total area of 98,900 acres, and containing a population, on the 5th April, 1891, of 477,891 inhabitants. The annual value of rateable property in the district was £6,598,451 in 1890, which at 1s. in the £1, the maximum rate the Board is empowered to levy in any one year, would yield a revenue of £329,922. It is probable, however, that it will be unnecessary at any time to levy a higher rate than 6d., which, on the present valuation, would yield £164,900; and if to this be added the net revenue from waterworks (after paying interest and expenses), averaging about £90,000,‡ the total income at present available for the maintenance and management of sewerage works, and for the payment of interest

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* At the end of the eighth year the rate will apparently be at a maximum, viz., 5¼d.
† For particulars of the constitution and functions of the Board, see Vol. I., paragraph 69.
‡ See also paragraph 513 *ante*.

and instalments towards a sinking fund for the redemption of loans, will amount to £254,900 per annum. The Board, whilst adopting generally the recommendations contained in Mr. Mansergh's scheme, has decided to concentrate all the sewage on one farm near the Werribee River, for which purpose it is in treaty for the purchase of 8,400 acres of red loamy soil averaging 30 feet deep overlying basalt. The sewers are to be designed to carry 30 cubic feet of sewage matter per head per diem, and will generally follow the lines of drainage as sketched by Mr. Mansergh. To enable them to commence the works, the Board is about to raise a loan of £2,000,000 at 4 per cent. with a currency of 30 years. The total amount it is authorized to borrow is £5,000,000, exclusive of loans amounting to £2,389,934 outstanding at the present time (October, 1891), which were originally contracted by the Government and taken over by the Board. Besides its annual income, works, buildings,* etc., constructed at a cost of £3,378,247, and 67,450 acres of land, have been handed over to the Board by the Government.

Leases and rental of farms.

525. Throughout Victoria, the duration of leases of farms from private persons was returned in 1890-91 as averaging from $2\frac{1}{2}$ to $5\frac{1}{2}$ years; the extreme figures being 1 year and 10 years. The average rental of agricultural land per acre was stated to be from 6s. 3d. to 19s. 6d.; the extreme figures being 2s. 6d. and 50s. The average rental of pastoral land per acre was stated to be from 2s. 3d. to 8s. 3d.; the extreme figures being 1s. and 25s. It may be mentioned that 3s. 6d. per annum for as much land as will carry one sheep to the acre is considered a fair rental; thus land capable of carrying two sheep to the acre ought to be let for 7s. per acre per annum.†

Prices of agricultural produce.

526. Each collector of statistics is required to furnish a statement of the price of the principal articles of agricultural produce in his district at the time he makes his rounds. The prices, being those prevailing in the place where the crops are grown, are generally lower than those obtaining in Melbourne, which are quoted at the end of Part Interchange, *ante*. The following is an average deduced from the returns of all the districts during each of the last 22 years:—

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* See also paragraph 69, Vol. I.

† In certain parts of the colony, where the soil is of especially good quality—especially in the Western District—much higher rentals have sometimes been obtained.

Prices of Agricultural Produce, 1870 to 1891.

During February and March.	Wheat.	Oats.	Barley.	Maize.	Hay.	Potatoes.	Turnips.	Mangolds
	per bushel.	per bushel.	per bushel.	per bushel.	per ton.	per ton.	per ton.	per ton.
	s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
1870 ...	4 3	3 7	4 0	4 10	77	75 0	...	40 0
1871 ...	5 4	3 9	4 11	5 3	76	70 0	...	36 0
1872 ...	4 8	2 11½	3 6¼	4 2	64	65 6	...	28 1
1873 ...	4 9	3 5	4 1	3 10	81	67 4	...	24 5
1874 ...	5 9	5 6	5 3	5 9	88	118 3	...	31 4
1875 ...	4 5	4 3	4 6	4 8	89	89 0	...	28 0
1876 ...	4 7	3 3	3 10	4 8	82	87 0	...	23 8
1877 ...	5 10	3 7	3 10	4 4	93	114 0	...	31 6
1878 ...	5 1	4 6	4 4	5 4	87	115 0	...	37 3
1879 ...	4 2	3 6	4 1	4 2	75	92 4	...	25 6
1880 ...	4 0½	2 3½	4 8	3 6½	63	69 11	...	24 11
1881 ...	4 1¾	2 3	4 11¼	5 0	60	46 3	...	24 0
1882 ...	5 0	3 3	3 6	5 4	76	70 0	...	25 4
1883 ...	4 9	3 1	4 1	4 7	81	75 4	...	30 5
1884 ...	3 8	2 8	3 6	4 8	67	74 8	35 5	29 5
1885 ...	3 4	3 0	3 6	4 5	74	80 0	40 0	34 0
1886 ...	3 10	2 10	3 3	4 1	74	100 0	48 6	24 6
1887 ...	3 9	2 9	3 3	4 4	73	80 0	54 0	28 4
1888 ...	3 4	2 7	3 6	4 2	59	65 0	27 0	24 0
1889 ...	4 7	3 10	4 2	4 10	102	163 2	46 6	30 7
1890 ...	3 8	2 10	3 2	4 1	62	83 4	58 3	28 5
1891 ...	3 5	2 4	2 9	3 6	55	77 10	32 6	28 7

Prices of agricultural produce, 1890-91 and previous years.

527. The drought which occurred in 1888, together with the failure of crops in other parts of the world, caused the prices of all articles of agricultural produce to rise considerably in 1889, but the promise of improved yields, consequent upon the plentiful rainfall which took place in that year, caused a fall in price in 1890, and a further fall in the early part of 1891, until the prices were in all cases extremely low, and in some cases the lowest during the last 22 years.

Years of highest and lowest prices.

528. It will be observed that the price of wheat was highest in 1877, that of oats, barley, and maize in 1874, that of turnips in 1890, that of mangolds in 1870, and that of hay and potatoes in 1889; also, that the price of wheat was lowest in 1885, 1888, and 1891, that of barley, maize, and hay in 1891, that of oats and potatoes in 1881, that of mangolds in 1876, and that of turnips in 1888.

Price of wheat in London.

529. The wholesale price of wheat per Imperial quarter* in London during 1890 varied from 29s. 9d. in April to 36s. 3d. in August—the average for the year being 32s. Although the price has fallen off considerably since 1883, when it averaged 41s. 7d., in 1890 it was higher than that in 1886, 1888 or 1889—that in the last-named

* The Imperial quarter is equal to 8 bushels.

year being the lowest recorded since 1761, when it was 26s. 9d.* The following statement of the average *Gazette* prices (wholesale) during the six years ended with 1889 has been taken from an official source,† and that of the average prices in 1890 and the first eight months of 1891 has been taken from the London *Statist* :—

AVERAGE PRICE PER QUARTER OF WHEAT IN LONDON.

Month.	1884.		1885.		1886.		1887.		1888.		1889.		1890.		1891.	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
January	38	7	33	7	29	10	35	8	31	1	30	2	30	0	32	7
February	37	3	32	8	29	5	33	3	30	4	29	6	29	11	32	5
March	37	7	31	10	29	10	32	10	30	4	30	1	29	10	33	1
April	37	5	34	1	30	7	32	9	30	4	29	10	29	9	37	6
May	37	9	36	8	31	10	33	9	31	5	29	9	32	0	40	5
June	37	2	33	6	31	7	35	1	31	6	28	6	32	10	40	0
July	37	0	33	8	31	2	34	4	31	10	29	2	33	2	38	7
August	36	11	33	5	32	5	32	6	35	0	30	9	36	3	38	8
September ...	33	9	31	3	31	10	29	1	35	10	29	11	34	0	...	
October	32	3	30	11	29	11	29	2	31	5	29	8	31	1	...	
November ...	31	5	30	11	31	2	30	5	31	10	30	1	32	3	...	
December... ...	31	1	30	6	33	2	31	0	31	0	30	0	32	4	...	
The Year ...	35	8	32	10	31	0	32	6	31	10	29	9	31	11	...	

530. Another official authority‡ gives the highest, lowest, and average *Gazette* price of wheat, barley, and oats in England and Wales as follows, during each of the eleven years ended with 1889 :— Price of wheat, barley, and oats in England.

AVERAGE PRICE OF WHEAT, BARLEY, AND OATS IN ENGLAND AND WALES.

Year.	Average Price per Quarter.								
	Wheat.			Barley.			Oats.		
	Highest Weekly.	Lowest Weekly.	The Year.	Highest Weekly.	Lowest Weekly.	The Year.	Highest Weekly.	Lowest Weekly.	The Year.
	s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
1879	50 5	37 7	43 10	43 2	24 0	34 0	26 7	19 2	21 9
1880	48 4	39 5	44 4	37 7	25 7	33 1	28 2	20 2	23 1
1881	52 2	40 9	45 4	35 8	26 11	31 11	24 6	19 5	21 9
1882	51 3	39 2	45 1	36 11	25 10	31 2	25 9	19 1	21 10
1883	43 10	39 0	41 7	35 0	25 6	31 10	24 1	19 1	21 5
1884	39 0	30 5	35 9	32 8	27 1	30 8	23 5	18 10	20 3
1885	38 1	30 2	32 10	32 6	24 10	30 2	23 6	18 1	20 7
1886	33 11	29 0	31 1	29 7	22 4	26 7	21 4	16 7	19 0
1887	36 4	28 5	32 6	29 7	20 5	25 4	17 9	14 7	16 3
1888	38 1	30 0	31 11	32 5	18 8	27 10	20 9	15 5	16 9
1889	31 2	27 11	29 10	31 3	19 5	25 10	20 6	16 2	17 9

* See Supplement to *The Statist* for 1887.
† Giffen's Statistical Abstract for the United Kingdom, 1875 to 1889.
‡ Report on the Agricultural Returns of Great Britain, dated November, 1890, issued from the Privy Council Office, page 100.

Value of agricultural produce.

531. The value of the agricultural produce raised in Victoria during the year ended 1st March, 1891, may be estimated at 7⅘ millions sterling. The following table shows the means whereby such an estimate is arrived at :—

VALUE OF AGRICULTURAL PRODUCE,* 1890–91.

Name of Crop.	Gross Produce and Price.						Estimated Value.
				£	*s.*	*d.*	£
Wheat	12,751,295	bushels	@	0	3	5	2,178,346
Oats	4,919,325	,,	@	0	2	4	573,921
Barley	1,571,599	,,	@	0	2	9	216,095
Other cereals	1,330,976	,,	@	0	3	6	232,921
Grass and clover seed ...	36,415	,,	@	0	4	0	7,283
Potatoes	204,155	tons	@	3	17	10	794,503
Onions	13,961	,,	@	3	15	0	52,354
Chicory	1,859	,,	@	10	0	0	18,590
Other root crops	23,232	,,	@	1	10	0	34,848
Hay	567,779	,,	@	2	15	0	1,561,392
Green forage	245,332	acres	@	2	10	0	613,330
Tobacco	326	cwt.	@	2	16	0	913
Grapes, not made into wine ...	63,535	,,	@	0	10	0	31,767
Raisins	123,802	lbs.	@	0	0	9	4,692
Currants ...	3,317	,,	@	0	0	4½	62
Wine	2,008,493	gallons	@	0	4	0	401,699
Brandy	5,934	,,	@	0	10	0	2,967
Hops	7,931	cwt.	@	6	0	0	47,586
Other crops	1,095	acres	@	10	0	0	10,950
Garden and orchard produce	33,864	,,	@	30	0	0	1,015,920
	Total ...		...		...		7,800,139

Value of agricultural produce in various countries.

532. The following figures, showing the annual value of agricultural produce in some of the principal countries of the world, have been re-arranged from those contained in a table published in the report of the United States Department of Agriculture for the month of April, 1890† :—

ANNUAL VALUE OF AGRICULTURAL PRODUCE IN VARIOUS COUNTRIES.

	Millions of £.
United States	604
Russia	509
Germany	456
France	444
Austria	322
United Kingdom	266
Italy	178
Spain	136
Australia	76
Canada	58
Argentine Republic	19⅕

* For a summary of the estimated value of agricultural produce during a series of years, see table, "Value of Agricultural, Pastoral, and Mining Produce," *post.* † Page 168.

533. The standard weight of crops in Victoria is reckoned to be 60 lbs. to the bushel for wheat, 40 lbs. for oats, 50 lbs. for barley, and 56 lbs. for maize. The actual weight, however, differs in different districts. The wheat, during 1890-91, ranged from 50 lbs. to 67 lbs.; oats, from 36 lbs. to 45 lbs.; barley, from 40 lbs. to 60 lbs.; and maize, 50 lbs. to 64 lbs. In the same year, taking the districts as a whole, the average weight per bushel of wheat was 61 lbs.; of oats, 41 lbs.; of barley, 51 lbs.; and of maize, 57 lbs. Specific weight of crops.

534. The following figures show the average rates paid for agricultural labour in the last two years. Rations are allowed in all cases in addition to the wages quoted, except in the case of threshers, hop-pickers, and maize-pickers:— Rates of agricultural labour.

RATES OF AGRICULTURAL LABOUR,* 1890 AND 1891.

Description of Labour.	1889-90.	1890-91.
	s. *d.*	*s.* *d.*
Ploughmen, per week	22 1	21 11
Farm labourers, „	19 9	18 10
Married couples, „	25 8	26 4
Females—Dairymaids „	11 11	12 2
„ Others „ ...	11 7	11 6
Mowers, „	32 6	28 7
„ per acre	5 2	5 2
Reapers, per week	30 4	28 7
„ per acre	14 9	12 6
Threshers, per bushel (without rations) ...	0 9	0 8
Hop-pickers, „ „ ...	0 3½	0 3½
Maize-pickers, per bag „ ...	0 5	0 4¾

535. The number and power of steam engines used on farms, and the value of farming plant and improvements, were returned as follow for the year under review and the previous one:— Plant and improvements on farms.

STEAM ENGINES, IMPLEMENTS, AND IMPROVEMENTS ON FARMS, 1890 AND 1891.

	1889-90.	1890-91.
Steam engines, number	654	667
„ horse-power	4,870	5,041
Value of farming implements and machines	£2,779,309	£2,837,023
„ improvement on farms ...	£15,729,676	£15,603,515

536. The following figures, which have been obtained by means of averages struck from the returns of the collectors in all the districts, show the rates paid for machine labor in the last two years:— Machine labour.

* See also table of Wages at the end of Part "Interchange," *ante*.

Machine Labour, 1890 and 1891.

Average Rates paid for—	1889-90.	1890-91.
	s. *d.*	*s.* *d.*
Machine reaping, per acre { With binding ...	8 2	7 9
Machine reaping, per acre { Without binding	4 7	4 10
,, mowing, ,, ...	3 9	4 7
,, threshing, per 100 bushels :—		
With winnowing	19 6	18 7
Without winnowing	16 6	14 3

Live stock, 1881 and 1891.

537. Information as to the numbers of live stock kept was obtained at the recent census, and these are compared in the following table with the numbers returned at the census taken ten years previously :—

Live Stock, 1881 and 1891.

Date of Enumeration.	Horses.	Cattle.			Sheep.	Pigs.
		Milch Cows.	Exclusive of Milch Cows.	Total.		
3rd April, 1881 ...	275,516	329,198	957,069	1,286,267	10,360,285	241,936
5th April, 1891 ...	436,459	395,091	1,387,887	1,782,978	12,692,843	282,457
Increase ...	160,943	65,893	430,818	496,711	2,332,558	40,521

Goats, asses, and mules.

538. Besides the live stock returned, as shown in the table, 68,426 goats, 135 asses, and 78 mules were enumerated in 1881 ; and 44,482 goats, 139 asses, and 224 mules in 1891.

Stock per square mile.

539. There are now in Victoria 5 horses, 20 head of cattle, 144 sheep, and 3 pigs, or, taking the different kinds together, 172 head of stock of these descriptions, large and small, to the square mile. At the census of 1881 there were 3 horses, 15 head of cattle, 118 sheep, and 3 pigs, or, altogether, 139 head of stock to the square mile.

Dairy produce.

540. No complete returns of dairy produce have ever been obtained in Victoria, but in 1889-90 it was ascertained that 31,775 milch cows produced on the average 42,285 gallons of milk daily, or about 15½ million gallons annually, from which over 2,200,000 lbs. of butter and 1,790,000 lbs. of cheese were made in the year. Victorian butter is now being exported to the United Kingdom under the supervision

of the Victorian Department of Agriculture. The following estimate of the value of the dairy produce of the colony has been compiled according to the method adopted by Mr. D. Wilson, Government Dairy Expert, in his paper on "The Dairy Industry," published in *Bulletin* No. 9 of the Victorian Department of Agriculture:—

VALUE OF DAIRY PRODUCE OF VICTORIA, 1890–91.

Nature of Produce.	Value.
	£
Milk consumed, at ¾-pint per head, per diem, 39,283,600 gallons at 8d.	1,309,453
Butter made from 87,437,200 gallons of milk, at an average of 2½ gallons to 1 lb. butter, 34,974,880 lbs. at 8d.	1,165,829
Cheese made from 17,487,400 gallons of milk, at an average of 1 lb. per gallon of milk, 17,487,400 lbs. at 6d.	437,185
Total	2,912,467

NOTE.—The total milk yield is estimated—allowing 1 gallon of milk per diem to each milch cow in the colony—at 144,208,200 gallons, and it is reckoned that, after taking into account the human consumption, five-sixths of the remainder is made into butter and one-sixth into cheese.

541. The following is a statement of the numbers of the different kinds of poultry kept according to the returns of the censuses of 1881 and 1891:— Poultry.

POULTRY, 1881 AND 1891.

Year of Census.	Number of Owners of Poultry.	Geese.	Ducks.	Fowls.	Turkeys.	Pea Fowls.	Guinea Fowls.
1881 ...	97,152	92,654	181,698	2,328,521	153,078	1,701	2,307
1891 ...	142,797	89,145	303,520	3,476,751	216,440	3,423	7,815
Increase ...	45,645	...	121,822	1,148,230	63,362	1,722	5,508
Decrease ...	...	3,509	...	...	...	...	...

542. It is seen that in ten years an increase of 45,645 took place in the number of keepers of poultry, also a considerable increase in all the different kinds of poultry except geese, which were fewer in 1891 than in 1881 by 3,500. Increase or decrease of poultry.

543. The live stock in the United Kingdom and any British Possessions, respecting which the information is available, is officially stated to have been as follows in the years named:— Live stock in British Possessions.

Live Stock in British Possessions.

Possessions.	Year.	Number of—			
		Horses.	Cattle.	Sheep.	Pigs.
The United Kingdom ...	1891	2,026,170	11,343,686	33,533,988	4,272,764
Malta	1887	7,171	10,673	14,609	...
Cyprus	1886	53,243	54,658	289,837	...
India*	1887–8	888,039	46,089,178	25,880,571	518,700
Ceylon	1889	5,891	1,037,216	75,373	...
Mauritius	1884	12,000	15,000	30,000	30,000
Cape of Good Hope ...	1888	295,370	1,502,845	14,463,445	166,835
Natal	1889	61,224	745,931	625,506	40,950
Canada	1881	1,059,358	3,514,989	3,048,678	1,207,619
Newfoundland ...	1884	5,436	19,884	40,326	...
Jamaica	1889	68,040	112,767	15,044	...
Falkland Islands ...	1889	3,025	6,521	589,772	67
Australasia†	1890–91	1,697,051	10,799,060	114,078,977	1,260,716
Fiji	1890–91	695	6,988	6,800	2,000

Live stock in Foreign countries.

544. The following table contains a statement of the number of horses, cattle, sheep, and pigs in the principal Foreign countries. The information has been derived entirely from official documents:—

Live Stock in Foreign Countries (000's omitted).

Country.	Year.	Number of—			
		Horses.	Cattle.	Sheep.	Pigs.
Europe.					
Austria	1880	1,463,	8,584,	3,841,	2,721,
Belgium	1880	272,	1,383,	365,	646,
Bulgaria	1887	...	...	6,872,	394,
Denmark	1888	376,	1,460,	1,225,	771,
France	1888	2,892,	13,377,	22,631,	5,847,
Germany	1883	3,522,	15,787,	19,190,	9,206,
Greece	...	108,	164,	3,465,	180,
Holland	1887	274,	1,526,	804,	490,
Hungary	1884	1,749,	4,879,	10,595,	4,804,
Italy	1881-2	660,	4,783,	8,596,	1,164,
Norway	1875	152,	1,017,	1,686,	101,
Portugal	1870	...	625,	2,977,	971,
Roumania	1888	554,	2,260,	4,807,	770,
Roumelia (Eastern) ...	1883	44,	371,	1,859,	107,
Russia (European) ...	1888	19,663,	24,609,	44,465,	9,243,
Servia	1882	123,	827,	3,621,	1,068,
Spain	1878	310,	2,353,	16,939,	2,349,
Sweden	1888	482,	2,349,	1,350,	610,
Switzerland	1886	98,	1,211,	338,	394,

* There are also in India 12 million buffaloes, and nearly 1 million mules. Goats are included with the sheep, as given above.

† For particulars relating to each colony, see third folding sheet *ante*, and Appendix A. *post*.

LIVE STOCK IN FOREIGN COUNTRIES (000'S OMITTED)—*continued.*

Country.	Year.	Number of—			
		Horses.	Cattle.	Sheep.	Pigs.
ASIA.					
Japan	1885	1,548,	1,060,	...	...
Java and Madura ...	1885	518,	4,530,	...	...
Russia in Asia ...	1874-83	1,070,	3,716,	10,612,	...
AFRICA.					
Algeria	1886	175,	1,198,	9,358,	87,
Egypt	1887	21,	462,	958,	...
Orange Free State ...	1881	132,	465,	5,056,	...
AMERICA.					
Argentine Republic ...	1888	5,000,	23,000,	80,000,	300,
Brazil	...	...	30,000,	...	...
Costa Rica	1884	...	206,	...	...
Guadaloupe	1880	6,	10,	14,	14,
Guatemala	1885	118,	494,	460,	...
Nicaragua	1884	...	400,	...	...
Paraguay	1887	62,	730,	32,	12,
United States	1889	14,214,	52,802,	44,336,	51,603,
Uruguay	1885	635,	5,924,	17,050,	100,
Venezuela	1883	292,	2,927,	3,491,	977,

545. The following summary of the live stock of the world was published by Mr. J. R. Dodge, statistician to the Department of Agriculture of the United States*:— Live stock of the world.

LIVE STOCK OF THE WORLD (000'S OMITTED).

Countries.	Horses.	Cattle.	Sheep.	Pigs.	Mules and Asses.	Goats.
Europe ...	33,253,	97,240,	186,557,	44,719,	3,727,	19,513,
Asia	4,195,	70,402,	36,649,	519,	1,182,	1,227,
Africa	656,	4,018,	28,959,	304,	600,	5,340,
North America ...	14,918,	55,093,	46,174,	51,530,	2,311,	15,
South America ...	5,992,	57,659,	101,090,	1,388,	1,512,	3,017,
Australasia ...	1,440,	8,966,	97,912,	1,208,	...	25,
Oceania ...	1,	3,	3,	20,	...	1,
Total ...	60,455,	293,381,	497,344,	99,688,	9,332,	29,138

546. The numbers of live stock slaughtered in Victoria are furnished by the local bodies, but it is probable the returns do not in every case include the animals slaughtered by private persons, and on Live stock slaughtered.

* See Report No. 59 (new series) for January and February, 1889, Government Printing Office, Washington.

farms and stations, and, therefore, that more were really slaughtered than the figures show. The following were the numbers returned for 1889 and 1890, those for the latter year being smaller than those for the former in the case of sheep and lambs, but larger in the case of other descriptions of stock:—

LIVE STOCK SLAUGHTERED, 1889 AND 1890.

Year.	Cattle and Calves.	Sheep and Lambs.	Pigs.
1889	250,822	2,383,946	145,724
1890	267,693	2,215,876	163,362
Increase ...	16,871	...	17,638
Decrease ...	...	168,070	...

Purposes for which stock was slaughtered.

547. The purposes to which the carcasses of the slaughtered animals were appropriated in 1890 were returned as follow:—

PURPOSES FOR WHICH LIVE STOCK WAS SLAUGHTERED, 1890.

Description of Live Stock.	Numbers Slaughtered for—			
	The Butcher and Private use.	Preserving or Salting.	Boiling down for Tallow or Lard.	Total.
Cattle and Calves ...	266,819	740	134	267,693
Sheep and Lambs ...	2,187,365	26,525	1,986	2,215,876
Pigs	85,668	77,694	...	163,362
Total	2,539,852	104,959	2,120	2,646,931

Stock slaughtered for preserving.

548. In the 10 years ended with 1889, the returns show the average number slaughtered annually for preserving and salting to have been of cattle 735, of sheep and lambs 75,066, and of pigs 54,499. These numbers, as regards pigs, are much below, but as regards sheep, are much above, the numbers slaughtered for the same purposes in 1890, the numbers of cattle slaughtered being about the same.

Wool produced, 1889 and 1890.

549. The quantity of wool produced in Victoria during the year 1890 may be set down as 55,558,930 lbs.* valued at £2,862,125. These figures represent the excess of exports over imports during the year, to which is added the quantity and value of wool used in Victorian woollen mills. In the previous year, the quantity produced, similarly estimated, was 56,954,721 lbs., valued at £2,449,368.

* The quantity of *Victorian* wool, including Angora wool, exported in 1890, according to the Customs returns, was 114,652,242 lbs., or considerably more than the total quantity given above as produced in Victoria.—(See footnotes on pages 28 and 29, *ante*.)

550. The following is a statement of the quantity and value of wool produced in the various Australasian colonies in 1889 and the three preceding years. The estimate for each of the other colonies has been made upon the same principle as that for Victoria, viz., by substituting the difference between the imports and the exports for the entry as to the origin of the wool made at the Customs, to which has been added an estimate for the quantity used for manufacturing purposes during each of the years :— Wool produced in Australasian colonies, 1886 to 1889.

WOOL PRODUCED IN THE AUSTRALASIAN COLONIES, 1886 TO 1889.*

Colony.	1886.	1887.	1888.	1889.
QUANTITY.	lbs.	lbs.	lbs.	lbs.
Victoria	57,439,634	48,420,119	54,143,961	56,954,721
New South Wales ...	171,228,430	216,650,129	236,638,426	258,233,636
Queensland ...	28,700,546	47,482,926	50,675,289	59,228,753
South Australia ...	40,991,388	42,198,632	41,650,088	39,352,984
Western Australia ...	6,139,917	6,675,713	8,475,240	9,501,695
Tasmania... ...	8,300,180	9,846,830	7,134,438	6,383,921
New Zealand ...	92,741,733	90,776,881	87,291,513	105,779,923
Total ...	405,541,828	462,051,230	486,008,955	535,435,633
DECLARED VALUE.	£	£	£	£
Victoria	2,778,160	2,400,515	2,577,107	2,449,368
New South Wales ...	6,947,526	8,925,516	9,167,534	10,501,664
Queensland ...	1,413,908	2,368,711	2,258,365	2,680,134
South Australia ...	1,227,007	1,323,879	1,334,589	1,354,377
Western Australia ...	332,519	333,785	423,762	395,903
Tasmania... ...	319,227	422,531	317,423	292,770
New Zealand ...	3,200,499	3,453,278	3,386,504	4,213,358
Total ...	16,218,846	19,228,215	19,465,284	21,887,574

551. It appears by the figures that Victoria, in 1889, produced considerably less than a fourth as much wool as New South Wales, and rather more than half as much as New Zealand. She, however, produced only a little less than Queensland, and half as much again as South Australia. Western Australia, notwithstanding the immense extent of her territory, produced only half as much again as the island of Tasmania. The wool clip was much larger in 1889 than in any of the other years in New South Wales, Queensland, Western Australia, and New Zealand, but was exceeded in one or more of the previous years in the other colonies. Wool produced in each colony.

552. The figures also show that the wool produced in the Australasian colonies, in 1889, was more by 49½ million pounds than in 1888, Wool produce of four years compared.

* For later figures see Table XVIII. in Appendix A., *post*.

by nearly 73½ million pounds than in 1887, and by nearly 130 million pounds than in 1886; and, further, that the value of such wool was greater in 1889 than in 1888 by £2,422,000; than in 1887 by £2,660,000; and than in 1886 by nearly £5,670,000.

Exports of Australasian wool, 1890-91.

553. According to returns obtained from brokers and others connected with the wool trade in Melbourne, 1,618,052 bales of wool were exported from the Australasian Colonies in 1890-91, and of this about four-fifths was sent from the Australian continent. The following are the quantities from each colony given in bales* :—

EXPORTS OF WOOL FROM AUSTRALASIAN COLONIES, 1890-91.

Colony.	Bales of Wool exported therefrom.	Colony.	Bales of Wool exported therefrom.
Victoria	419,989	Tasmania ...	20,273
New South Wales ...	566,465	New Zealand ...	308,489
Queensland	121,669		
South Australia ...	155,603	Grand Total ...	1,618,052
Western Australia ...	25,564		
Total	1,289,290		

Destination of Australasian wool, 1890-91.

554. According to the same authority 83 per cent. of Australasian wool in 1890-91 was sent to London, 15 per cent. to the continent of Europe, nearly 2 per cent. to America, and a fraction to Japan. The following are the figures :—

DESTINATION OF AUSTRALASIAN WOOL, 1890-91.

Country.	Bales of Wool sent thereto.	
	Number.	Proportion per cent.
London	1,346,122	83·2
Continent of Europe ...	240,737	14·9
America	29,235	1·8
Japan	1,958	·1
Total	1,618,052	100·0

Wool produced in various countries.

555. The following statement of the wool produced in one year in various countries has been computed, except as regards Australasia,

* The weight of a bale of wool is about 250 lbs. for washed and 350 to 360 lbs. for greasy wool. Only about 10 per cent. of the wool being washed, the average weight of a bale may be set down as 349 lbs.

from figures given in the Third Annual Report of the Statistical Institute of Holland *:—

WOOL PRODUCED IN VARIOUS COUNTRIES.

	lbs.
Australasia (1889) ...	535,436,000
Russia (1878)	390,548,800
Argentine Republic (1882)	244,666,040
United States (1882) ...	233,073,000
United Kingdom (1882) ...	127,942,200
France (1879)	90,319,920
Spain (1878)	66,120,000
Germany (1881)... ...	54,879,600
Cape Colony (1881) ...	42,427,000
Uruguay (1880)... ...	41,369,080
Hungary (1880)... ...	35,682,760
British India (1881-2) ...	21,400,840
Italy (1874)	21,378,800
Asiatic Turkey and Persia	13,224,000
Natal (1881)	12,496,680
Austria (1881)	10,909,800
Portugal	10,358,800
Belgium (1865)	4,408,000
British North America (1881)	3,570,480
Sweden (1870)	3,306,000
Other countries	96,976,000
Total	2,060,493,800

Fall in price of wool.

556. The average price per lb. of Victorian wool in 1890, based upon its declared value before leaving this colony, as obtained from the Customs returns of exports, was not quite $10\frac{3}{4}$d., as against nearly $10\frac{1}{2}$d. in 1889, not quite $10\frac{1}{8}$d. in 1888, nearly $10\frac{5}{8}$d. in 1887, $11\frac{3}{8}$d. in 1886 and 1885, and $12\frac{7}{8}$d. in 1884. There was thus a rise of about $\frac{1}{4}$d. per lb. as compared with 1889, of $\frac{5}{8}$d. as compared with 1888, and of $\frac{1}{8}$d. as compared with 1887, but a fall of $\frac{5}{8}$d. per lb. as compared with 1886 or 1885, and of $2\frac{1}{8}$d. per lb. as compared with 1884. This would appreciate the wool produced in Victoria during 1890 by nearly £60,000 as compared with the average price in 1889, by £144,700 as compared with the price in 1888, and by less than £29,000 as compared with that in 1887; but depreciate it by £144,700 as compared with the average price in 1886 or 1885, and by £490,000 as compared with the price in 1884.†

Price of wool in Melbourne.

557. In the foregoing paragraph, the price given is the average for all descriptions of wool included in the one total, so that it is possible that a variation in the quality or condition may to a certain extent account for the difference in the declared value. The variation in the price of wools of like quality will, however, be readily recognised by means of the figures in the following table, which have been kindly supplied for this work by Messrs. Goldsbrough, Mort and Co. (Limited), Melbourne:—

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* See *Bijdragen van het Statistich Instituut*, Amsterdam, 1887, page 19; there given in kilogrammes, each of which has been assumed to be equal to 2·204 lbs.

† See also Part "Interchange," *ante*, where the export value of all wool—not Victorian wool only—is dealt with.

Average Price per lb. of Wool (Fleece) in Melbourne, 1885 to 1891.

Year.	Greasy.		Clean.*	
	Merino.	Crossbred.	Fleece Washed.	Scoured.
	d.	*d.*	*d.*	*d.*
1884–5	10½	9	20	19
1885–6	8½	8	16	15
1886–7	10½	9	17	18
1887–8	9½	8	15½	16
1888–9	10½	10	18	17½
1889–90	11½	11	18½	19½
1890–91	10	9	15	16½

Average price of wool sold in Victoria, 1890 and 1891.

558. According to returns obtained from the selling brokers, the average price per bale† of all wool sold in Melbourne and Geelong was £11 8s. in the season 1890-91, as compared with £14 17s. 11d. in 1889-90, thus showing a falling-off of 23½ per cent. in the average value.

Price of Australian wool in London.

559. The average price in 1889 of Australian wool in London, as officially computed from the returns of imports by the Agricultural Department of‡ the Privy Council, was the same as in 1888, ¼d. lower than in 1885 and 1887, 1d. higher than in 1886, and much lower than in any other previous years. The following are the results obtained for the twenty-one years ended with 1889:—

Average Price of Australian Wool in London, 1869 to 1889.

	per lb. *s.*	*d.*		per lb. *s.*	*d.*
1869	1	3	1880	1	2¾
1870	1	3¼	1881	1	2½
1871	1	2¼	1882	1	0½
1872	1	3	1883	1	0½
1873	1	3¼	1884	1	0½
1874	1	2¾	1885	0	10½
1875	1	4¼	1886	0	9¼
1876	1	3¼	1887	0	10½
1877	1	3	1888	0	10¼
1878	1	2½	1889	0	10¼
1879	1	2½			

Value of pastoral produce.

560. The following is an estimate of the gross value of pastoral produce raised on holdings of all descriptions in 1890-91:—

* Comprising both merino and crossbred.

† For average weight of a bale of wool see footnote to paragraph 553 *ante*.

‡ Report dated November, 1890, page 101.

Value of Pastoral Produce, 1890-91.

Nature of Produce.	Value.
	£
Milk, butter, and cheese, from 395,091 milch cows kept, @ £8 10s. ...	3,358,273
Estimated value of stock produced in 1890 :—	
Cattle, 395,091, viz., 263,394, @ £8, and 131,697 (calves), @ 30s.	2,304,698
Sheep, 3,184,036, @ 7s. 6d.	1,194,013
Pigs, 84,737, @ £2 10s.	211,842
Horses, 21,823, @ £8	174,584
Excess of exports over imports of wool, Customs value	2,743,364
Estimated value of wool used in the colony for manufacturing purposes, 1,780,859 lbs., @ 1s. 4d.	118,724
Total	10,105,498

Note.—The principle on which the numbers of "stock produced" have been estimated is as follows :—It has been assumed that the increase of cattle amounted to one to every milch cow, and that one-third of the calves born were slaughtered, the remainder taking the place of the older cattle slaughtered. The increase of sheep has been reckoned at 25 per cent. on the total number of both sexes over six months old in the colony, that being the proportionate increase ascertained by Mr. A. J. Skene, the late Surveyor-General of Victoria, to have taken place during a series of years on nearly 3¾ millions of sheep on 34 stations situated in various parts of the colony. The increase of pigs and horses has been arbitrarily estimated at 30 and 5 per cent. respectively upon the total numbers of such stock. The value per head set down for the different kinds of stock is intended to represent the average value per head of all the stock of each kind in the colony, young and old ; for although the stock born in the year would be only six months old, on the average, when the year terminated, and would, consequently, not be of so high a value as the figures indicate, yet all the growing or fattening stock may be considered to have become more valuable during the year, and the increase of bulk, and consequently of value, of such stock may fairly be set down as part of the year's produce as much as the stock actually born therein, the numbers of the latter being taken as a basis whereto such values may be applied. The quantity of wool manufactured in Victoria has been ascertained from the various woollen mills. No estimate has been made of the value of meat, tallow, lard, hides, skins, horns, hoofs, bones, etc., as this is supposed to be included in the value of stock produced.

Australasian fresh meat in London.

561. Australian-killed fresh meat was delivered in London for the first time in the year 1880, when the supply consisted of 60 carcasses of beef and 555 of mutton. New Zealand fresh meat was first delivered in 1882. The following, according to the Agricultural Department of the Privy Council,* are the quantities delivered from Australasia in the nine years ended with 1889 :—

Australian and New Zealand killed Fresh Meat delivered in London, 1881 to 1889.

	Cwt.		Cwt.
1881	11,300	1886	294,220
1882	34,540	1887	302,140
1883	93,420	1888	398,960
1884	222,560	1889	533,680
1885	230,400		

Price of meat in London.

562. In the same nine years the average prices of beef and mutton in London, by the carcass, are quoted as follow† :—

* Report dated November, 1890, page 84.

† *Ibid.*, pages 96 and 97.

Average Wholesale Price of Beef and Mutton in London, 1881 to 1889.

——	Beef per lb.	Mutton per lb.
1881	4½d. to 7¼d.	5d. to 9d.
1882	4¾d. „ 8d.	5½d. „ 9½d.
1883	5d. „ 8d.	5¾d. „ 9¾d.
1884	4¼d. „ 7¾d.	5d. „ 8¾d.
1885	3¾d. „ 6¾d.	4¼d. „ 7½d.
1886	3½d. „ 6¼d.	4d. „ 8d.
1887	3d. „ 5¾d.	3¼d. „ 7d.
1888	3¼d. „ 6¼d.	3¾d. „ 7¾d.
1889	3½d. „ 7¼d.	5d. „ 9d.

Rabbits.

563. Tame rabbits were kept in Victoria during the early years of the colony, but rabbits were first turned out upon an extensive scale by a landed proprietor in the Western district. They bred rapidly, and for several years there was a demand for specimens in most districts of the colony for breeding purposes. At that time no one seems to have thought of the nuisance they might eventually become, and of the large expenditure which would be necessary to keep down their numbers. There are now few parts of Victoria which are not infested with them, although, in consequence of the vigorous efforts which have been made by the Government, by Shire Councils, and by private individuals, to suppress the evil, there are not so many as formerly. It is found, however, that if efforts are relaxed they breed so rapidly that they soon become as numerous as ever. Some persons have advocated the introduction of animals hostile to rabbits, such as ferrets, weasels, or the mangouste (Indian ichneumon*), but where this has been tried it has been found that the introduced animals have been so destructive to poultry that the rabbits were the lesser evil of the two; it was also discovered that, as a rule, these animals only attack rabbits when hungry, and cease to do so as soon as they become satiated, consequently it would have been necessary to introduce immense numbers to cope with the multitude of rabbits with which the colony is infested. The most successful way of destroying rabbits has been found to be poisoning either with phosphorized oats or wheat, or with arsenic mixed with bran or chaff, or else with the fumes of bisulphide of carbon, which, being placed in their burrows, speedily effects the desired object if all the entrances are properly stopped. They are also largely trapped and shot, in which case their

* *Herpestes mangos* of Desmarest.

flesh is available for food. In 1890-91, the amount expended by the State on rabbit extermination was about £37,000, as compared with £24,860 in the previous year; the total amount in the last 12 years has been £204,800.

564. Active operations for the destruction of rabbits on Crown Lands were first undertaken by the Government in 1880, and from that date to the middle of 1891 sums amounting to £204,823 had been expended with that object. The following are the amounts spent in each year:— State expenditure on rabbit destruction.

STATE EXPENDITURE ON RABBIT EXTERMINATION, 1880-1891.

	£		£
1879-80	1,280	1885-86	24,833
1880-81	2,600	1886-87	21,065
1881-82	12,890	1887-88	20,551
1882-83	9,883	1888-89	17,621
1883-84	10,063	1889-90	24,860
1884-85	22,177	1890-91	37,000*

NOTE.—These amounts include expenditure on labour, inspectors' salaries, material, cartage, etc., and for working unoccupied Crown lands.

565. With the view of keeping the rabbits and wild dogs on the South Australian side of the border from crossing into Victoria, a fence of wire netting has been erected by the Victorian Government, commencing at about 36° 45′ south latitude and extending north to the Murray, a distance of 150 geographical miles. From the commencing point of this fence the Government of South Australia has fenced south for about 36 miles along the Victorian frontier, but it is not known whether it intends to continue the fencing to the sea. As the distance from the Murray to the sea is 282 miles, the portion undertaken by Victoria covers more than one-half of that length. Rabbit fence between Victoria and South Australia.

566. An Act was passed in 1889† to amend and consolidate the law providing for the destruction and suppression of rabbits and other vermin. This Act is administered by the Government, instead of by shire councils as previously under former Acts. It renders owners and occupiers liable for the destruction of all vermin on their lands, the Crown being responsible for all unoccupied Crown lands; and provides for the appointment by the Governor in Council of inspectors acting under the control of the chief inspector, who are empowered to take legal *Rabbit Suppression Act* 1890.

* Approximate figures.

† *The Vermin Destruction Act* 1889 (53 Vict. No. 1028), repealed and re-enacted by the Consolidated Act (54 Vict. No. 1153).

proceedings against defaulters, and to enter land and destroy vermin, or any harbours for vermin which it is desirable to remove, such as log or brush fences, etc. If the owners and occupiers neglect to do so after due notice, all charges and expenses so incurred to be recovered before a court of law. It also provides for the supply of wire netting to the settlers wherewith to erect rabbit proof fences, the amount to be paid back in ten annual instalments, without interest. All the settlers have to do is to apply to the shire councils for the wire netting, the estimated cost per mile being £18 or £20. The councils will be held responsible for the repayment, and are to collect the moneys advanced and account for the same to the Government. It has been suggested that the applicants should join in groups to fence in their holdings, it being relatively cheaper to fence in a large block than a number of small ones. In introducing the measure, the then Minister of Lands, the Hon. J. L. Dow, stated that whilst the annual expenditure of Victoria on rabbit destruction was about £20,000, that of New South Wales was about £90,000, and that of South Australia was over £40,000; but that the magnitude of the evil was not disclosed by these figures, which simply represented what was spent on Crown lands. In addition, there was the large expenditure incurred by private individuals in attempting to keep their land clear. In 1889-90 the sum of nearly £150,000 was lent by the Government for the purchase of wire netting in accordance with the provisions of the Act. The following account of the measures adopted during the year 1890 to exterminate the rabbits has been taken from the report of the chief inspector* :—

Extermination of Rabbits and Other Vermin.

Provision having been made in the present Act for the Government taking the administration of same, thereby relieving the shire councils of an annual expenditure of fully £14,000, operations were commenced on the 1st January, and the results have so far proved fairly successful.

I may state that of late years the extent of infested country has increased very much, especially in the Midland and North-Eastern districts, where the pest has obtained a firm hold in the localities favourable for burrowing, and where log and brush fences which provide harbour are to be found in the timbered districts.

Little or no action was taken by the shire councils in these districts to carry out the provisions of the former Act so as to check the pest; the task of enforcing the present Act has consequently been a difficult and arduous one.

In the Northern districts, where the rabbits were so great a plague some years ago, the number is now greatly reduced, and very seldom is a complaint made of the destruction of crops; whereas previously such complaints were very numerous, and the damage done was ruinous to the farmers.

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* For an account of the steps taken in previous years, see last edition of this work, Vol. II., paragraph 559.

The area more or less infested throughout the colony I estimate at 37,750,000 acres. A staff of 68 inspectors has been appointed to carry out the provisions of the Act; 20,800 notices under section 14 have been served on owners and occupiers to destroy rabbits; 152 convictions under the penal clauses of the Act have been obtained; the fines and costs awarded amount to £1,210, and for charges and expenses the sum of £700 has been received.

Two thousand five hundred notices, as required by the Act, have been served on owners and occupiers to destroy log and brush fences, stone walls, and live hedges, and I am pleased to state that many holders have complied with the notices. No steps have yet been taken by any of the inspectors to destroy fences in accordance with section 19. It is to be hoped, however, that all such fences will soon be destroyed, and replaced by post and wire fences, for until this be done the rabbits cannot be kept down.

The unoccupied Crown lands have received all necessary attention, and where practicable, with a view to economy, the work of rabbit extirpation has been let by contract. A large saving has thereby been effected; but, in consequence of the inspectors having to enforce the provisions of the Act, lands held as commons, and under leases, grazing licences, and mallee lands are being relinquished, owing to the great expense of keeping the land clear of rabbits. The expenditure, therefore, is increasing every month, and a much larger sum will be required next year for the work on Crown lands.

During the year the sum of £150,000, voted by Parliament for loans to shire councils to purchase wire netting, has been allocated amongst 54 shires. The majority of the shires have delivered the wire netting to farmers and others, and no doubt the erection of wire netting will tend to confine the rabbits within limited areas, where they can be more easily destroyed. It is satisfactory to report that a large majority of the shire councils are well satisfied with the working of the Act, and I have no doubt but that, with the aid of wire netting and vigorous administration, the rabbit plague will, in a few years, be reduced to a minimum. The South Australian border fence (150 miles in length) has been periodically inspected, and is in good order.

A large number of schemes and inventions for the destruction of rabbits have been submitted, principally from America, Germany, Great Britain, and India, but none of them are of any practical value.

The means of destruction carried out have been the same as heretofore, viz., poisoning, trapping, impregnating the burrows with bisulphide of carbon or other gases, and digging out. Poisoning and trapping no doubt cause a large percentage of rabbits to be destroyed, but unless the work is followed up by the burrows being dug out, and all cover, such as log and brush, fallen timber, etc., being destroyed, there is very little hope of the pest being effectively kept down.

One thousand one hundred and sixty-five wild dogs and 1,247 foxes have been destroyed during the year, at a cost of £1,550, the shire councils and vermin boards paying one-half of the amount.

Exports of rabbit skins.

567. In the fourteen years ended with 1890, nearly 44 millions of rabbit skins, valued at nearly £284,000, have been exported from Victoria. In addition to these, many have been used in the colony by hat manufacturers* and others, and large numbers have doubtless been destroyed or allowed to decay. The following are the exports of rabbit skins in the period referred to :—

* Mr. E. Shaw, the manager of the Denton Mills Hat Factory, reports that about 600 dozen rabbit skins weekly, or 374,400 yearly, are used in that establishment.

Exports of Rabbit Skins, 1877 to 1890.

Year.	Rabbit Skins Exported.		Year.	Rabbit Skins Exported.	
	Number.	Value.		Number.	Value.
		£			£
1877	700,565	5,790	1885	3,424,259	23,548
1878	711,844	6,206	1886	910,609	6,800
1879	1,036,372	7,322	1887	2,663,314	16,294
1880	3,309,408	21,674	1888	3,967,533	20,759
1881	4,473,108	32,217	1889	3,429,015	12,303
1882	4,929,432	37,538	1890	4,913,351	25,667
1883	4,245,596	30,364			
1884	4,963,371	37,243	Total ...	43,677,777	283,725

Rabbits sent to market in Melbourne.

568. The number of couples of rabbits received at the Melbourne fish market, the number sold, and the number condemned, during the last five years, were as follow :—

Rabbits sent to Melbourne Market.

Year.	Number of Couples of Rabbits.		
	Sold.	Condemned.	Total.
1886-7	346,856	4,460	351,316
1887-8	418,618	2,272	420,890
1888-9	474,384	13,458	487,842
1889-90	606,568	11,567	618,135
1890-91	676,796	5,955	682,751
Total	2,523,222	37,712	2,560,934

Flour mills.

569. In 1891, as compared with 1890, whilst a decrease of 3 occurred in the number of mills, of 32 in the number of pairs of stones, and of 7 in the number of hands employed, there was an increase of 32 in the horse-power of machinery, and of 29 in the sets of rollers in use. The wheat operated upon increased by 2,674,000 bushels, and the flour made by nearly 63,000 tons*; but, on the other hand, the other grain operated upon decreased by 127,000 bushels. An increase of £39,737 took place in the estimated value of machinery, lands, and buildings :—

* A ton of flour is considered to be equivalent to 2,000 lbs.

Flour Mills, 1890 and 1891.

Year ended March.	Number of Mills.	Mills employing—		Amount of Horse-power of Machinery.	Number of Pairs of Stones.	Number of Sets of Rollers.
		Steam-power.	Water-power.			
1890 ...	107	100	7	3,585	269	427
1891 ...	104	99	5	3,617	237	456
Increase	...	...	...	32	...	29
Decrease	3	1	2	...	32	...

Year ended March.	Number of Hands employed.	Grain operated upon.		Flour made.	Approximate total Value of—		
		Wheat.	Other.		Machinery and Plant.	Lands.	Buildings.
		bushels.	bushels.	tons.*	£	£	£
1890 ...	807	7,203,602	376,280	146,828	303,232	122,007	226,406
1891 ...	800	9,877,840	249,071	209,773	368,386	108,096	214,900
Increase	...	2,674,238	...	62,945	65,154	...	...
Decrease	7	...	127,209	...	...	13,911	11,506

570. The following was set down as the value of grain operated upon, and of flour, meal, etc., produced in flour mills, in 1891, and in the previous census year, 1881 :— Value of materials used and produced.

Flour Mills, 1881 and 1891.

	1880-81.		1890-91.
Value of materials operated upon	£1,412,099	...	£1,620,125
„ articles produced ...	1,651,351	...	2,043,604
Increased value	£239,252, or 17 per cent.		£423,479, or 26 per cent.

571. The breweries returned were fewer by 2, the hands employed in breweries by 67, and the horse-power of machinery by 21, in 1891 than in 1890; decreases also took place in the materials used and beer brewed, the latter being less by over 1,493,000 gallons than in the previous year. A higher value, however, by over £245,000 was set down for the machinery, plant, and buildings :— Breweries.

Breweries, 1890 and 1891.

Year ended March.	Number of Breweries.	Breweries employing— Steam-power.	Gas.	Water-power.	Manual Labour only.	Amount of Horse-power of Machinery.	Number of Hands employed.	Materials used. Sugar.	Malt.	Hops.
								lbs.	bushels.	lbs.
1890 ...	70	57	...	1	12	773	1,252	15,975,568	841,841	1,038,073
1891 ...	68	54	1	1	12	752	1,185	13,966,624	796,982	908,456
Increase ...	...	...	1	...	...	...	...	...	...	...
Decrease	2		...	...	...	21	67	2,008,944	44,859	129,617

Year ended March.	Beer made.	Approximate Total Value of— Machinery and Plant.	Lands.*	Buildings.
	gallons.	£	£	£
1890	20,051,346	206,233	702,406	399,851
1891	18,557,931	254,206	900,660	399,156
Increase ...	...	47,973	198,254	...
Decrease ...	1,493,415	...	...	695

Value of materials used and produced.

572. The value of the sugar, malt, and hops used, and of the beer made, were returned for the last two census years. The following are the figures given :—

Breweries, 1881 and 1891.

	1880-81.		1890-91.
Value of materials used ...	£442,885	...	£491,932
„ beer made ...	780,501	...	971,489
Increased value ...	£337,616, or 76 per cent.		£479,557, or 97 per cent.

Consumption of beer per head.

573. The beer made in Victoria during 1890-91 amounted to 18,557,931 gallons ; and the quantity imported, after deducting exports, was 1,502,706 gallons. These numbers gave a total consumption of 20,060,637 gallons, or an average of $17\frac{2}{3}$ gallons per head. The consumption of beer per head in 1889-90 was as much as $19\frac{2}{5}$ gallons, in 1888-9 20 gallons, in 1887-8 $18\frac{2}{3}$ gallons, in 1886-7 $17\frac{1}{2}$ gallons, and in the two previous years no more than 16 gallons.

Beer brewed in various countries.

574. The following is a statement of the quantity of beer brewed in one year in the United Kingdom, four countries of Europe, and the United States :—

* The figures in this column apply to purchased lands only. One brewery in 1890 was upon Crown lands ; in this case no valuation of the land has been given.

Beer Brewed in Various Countries* (000's omitted).

	gallons.		gallons.
United Kingdom (1885) ...	989,890,	Austria-Hungary (1884) ...	272,624,
Holland (1884)	932,228,	Belgium (1885)	206,074,
United States (1888) ...	819,640,	France (1883)	189,618,

575. The average annual consumption of malt liquor per head in various countries may be set down as follows, the figures being generally calculated over a series of years :— Consumption of beer in various countries.

Annual Consumption of Beer per Head in Various Countries.

	gallons.		gallons.
United Kingdom	28·74	Tasmania	10·02
South Australia	20·04	New Zealand	9·59
Germany	19·38	Switzerland	8·15
Victoria	19·36	Austria-Hungary	6·83
Holland	19·05	France	4·53
New South Wales	11·94	Canada	3·05
United States	10·74	Sweden	2·52
Queensland	10·23		

576. The number of brickyards and potteries was the same as that returned in 1890, and whilst the hands employed were fewer by 121, the horse-power of the machinery employed was increased by 514. Brickyards and potteries.

The number of bricks made was smaller than in the previous year by nearly 34¾ millions, and there was also a decrease of nearly £2,100 in the value of pottery made. The plant, land, and buildings show an increased value of about £115,600. The following are the comparative figures for the two years :—

Brickyards and Potteries, 1890 and 1891.

Year ended March.	Number of Brick-yards and Potteries.	Number of Machines in use.		Brickyards employing—			Amount of Horse-power of Machinery.	Number of Hands employed.
		For tempering or crushing Clay.	For making Bricks or Pottery.	Machines worked by—		Manual Labour.		
				Steam.	Horses.			
1890 ...	233	237	117	78	82	73	2,384	3,243
1891 ...	233	251	146	78	99	56	2,898	3,122
Increase	...	14	29	...	17	...	514	...
Decrease	...	...	...	...	...	17	...	121

* Computed, in most cases, from figures given in the *Bijdragen van het Statistisch Instituut*, 1887, page 15, there stated in hectolitres, each of which has been assumed to be equal to 22 Imperial gallons.

BRICKYARDS AND POTTERIES, 1890 AND 1891—*continued.*

Year ended March.	Number of Bricks made.	Approximate Total Value of—			
		Pottery made.	Machinery and Plant.	Lands.*	Buildings.
		£	£	£	£
1890 ...	276,650,844	70,240	293,560	406,462	222,206
1891 ...	241,928,340	68,160	335,766	449,766	252,315
Increase ...	...	...	42,206	43,304	30,109
Decrease ...	34,722,504	2,080	...	...	...

Tanneries, fellmongeries, etc.

577. The establishments for tanning and wool-washing were less numerous by 5, and the tanpits by 138, in 1891 than in 1890, although an increase of 93 took place in the number of hands employed. The returns also show an increase of over £74,200 in the value of plant, lands, and buildings connected with that industry. Notwithstanding the decrease in the number of establishments, the work done as a whole was in excess of that in the previous year; the hides tanned being more numerous by 17,427, the skins tanned by 154,283, the skins stripped by 13,796, and the wool washed other than that stripped from skins, by 251,393 lbs. The following are the particulars for the two years:—

TANNERIES, FELLMONGERIES, AND WOOL-WASHING ESTABLISHMENTS, 1890 AND 1891.

Year ended March.	Number of Establishments.	Establishments employing—					Amount of Horse-power of Machinery.	Number of Hands employed.	Number of Tan Pits.
		Steam-power.	Wind-power.	Water-power.	Horse-power.	Manual Labour only.			
1890	137	68	...	1	11	57	825	1,576	3,644
1891	132	68	2	1	9	52	824	1,669	3,506
Increase ...	...	...	2	...	...	...	...	93	...
Decrease ...	5	...	...	...	2	5	1	...	138

Year ended March.	Number Tanned of—		Number of Skins Stripped of Wool.	Other Wool Washed.	Approximate Total Value of—		
	Hides.	Skins.			Machinery and Plant.	Lands. †	Buildings.
				lbs.	£	£	£
1890 ...	348,144	1,768,574	2,441,968	9,443,197	107,535	105,607	138,296
1891 ...	365,571	1,922,857	2,455,764	9,694,590	153,055	115,240	157,358
Increase	17,427	154,283	13,796	251,393	45,520	9,633	19,062

* The figures in this column apply to purchased lands only. Thirty-one of the brickyards in 1890, and thirty-four in 1891, were on Crown lands.

† The figures in this column apply to purchased land only. Seven of the establishments in 1890, and five in 1891, were on Crown lands. In these cases no valuation of land is given.

578. An estimate of the value of the materials used and articles produced in tanneries, fellmongeries, and wool-washing establishments was obtained in the last two census years. The following are the figures :— Value of materials used and produced.

TANNERIES, FELLMONGERIES, AND WOOL-WASHING ESTABLISHMENTS, 1881 AND 1891.

	1880-81.		1890-91.
Value of materials used ...	£1,008,531	... ...	£793,679
„ articles produced	1,406,274	... ...	1,226,853
Increased value ...	£397,743, or 39 per cent.		£433,174, or 55 per cent.

579. An Act* to encourage the growth of the several species of acacia, locally known as "wattle," the bark of which is of great value for tanning purposes, was passed on the 25th November, 1889. The Act allows selections of 1,000 acres each for wattle cultivation, to be taken up on a 21 years' lease at a rental of not less than 2d. per acre per annum for the first seven years, not less than 4d. for the next seven years, and not less than 6d. for the third period of seven years, the right being given to select 320 acres of the area as a freehold. It is stipulated that the planting of one-fifth of the area must be made each year after the first, so that the whole may be covered by the end of the sixth year. The tree being of exceedingly quick growth, the bark is fit for stripping in 5 or 6 years. It is a peculiarity of the wattle that whilst its timber, which is valueless, becomes finer on good land, its bark producing qualities are said to be greatest on poor arid soils. Large areas of land suitable for the growth of the wattle have been thrown open for selection under this Act. Wattle Cultivation Bill.

580. The forest saw mills, or those established for the purpose of cutting native timber at or near the place at which it is grown were separated from the town saw mills for the first time in 1890-91. The following are the statistics of the industry referred to :— Forest sawmills.

FOREST SAW MILLS, 1890-91.

Number of forest saw mills	202
Number using steam power	195
Number using water power	7
Horse-power of steam engines	3,149
Hands employed	2,767
Superficial feet of timber produced ...	152,434,583
Value of timber produced	£608,759
„ machinery and plant	£231,603
„ lands	£52,071 †
„ buildings	£61,082

* *The Wattle Trees Cultivation Act* 1889 (53 Vict. No. 1,037); repealed and re-enacted by 54 Vict. No. 1,157.

† These figures apply to purchased land only. Thirteen of these establishments were on Crown Lands. In these cases no valuation of the land is given.

Woollen mills.

581. The number of woollen mills returned was the same in 1891 as in 1890, a decrease of 19 occurred in the number of hands employed. There was an increase of £31,077 in the value of plant, lands, and buildings, of 41,930 lbs. in the quantity of wool used, of 86,488 in the number of yards of tweed, cloth, and flannel made, of 1,988 in the number of spindles used, and substantial increases in the number of blankets and shawls manufactured :—

WOOLLEN MILLS, 1890 AND 1891.

Year ended March.	Number of Woollen Mills.	Number of Spindles.	Horse-power of Machinery.	Quantity of Wool used.	Goods Manufactured : Quantity of—		
					Tweed, Cloth, Flannel, etc.	Blankets.	Shawls.
				lbs.	yards.	pairs.	number.
1890 ...	7	23,190	775	1,738,929	1,039,168	2,362	658
1891 ...	7	25,178	760	1,780,859	1,125,656	3,430	1,000
Increase ...	...	1,988	...	41,930	86,488	1,068	342
Decrease ...	...	...	15	...	...	...	...

Year ended March.	Hands employed.		Approximate Total Value of—		
	Males.	Females.	Machinery and Plant.	Lands.	Buildings.
			£	£	£
1890	423	387	129,109	7,481	52,108
1891	408	383	153,436	7,731	58,608
Increase ...	...	...	24,327	250	6,500
Decrease ...	15	4	...	...	...

Value of articles used and produced.

582. The value of the raw material used in woollen mills, and of the articles produced, was returned in 1881 and 1891. The following are the figures :—

WOOLLEN MILLS, 1881 AND 1891.

	1880-81.	1890-91.
Value of materials used ...	£89,412	£94,932
,, articles produced ...	168,710	170,687
Increased value ...	£79,298, or 89 per cent.	£75,755, or 80 per cent.

Cotton manufacture in various countries

583. The manufacture of cotton has not yet been introduced into Australia, but statistics of its manufacture elsewhere may not be uninteresting. The following is a statement of the number of spindles in use in the United Kingdom, the Continent of Europe, the United States, and India, in each of the four years ended with 1888 :—

Spindles for Manufacturing Cotton in Use in Various Countries, 1885 to 1888.

(000's omitted.)

Countries.	Number of Spindles.			
	1885.	1886.	1887.	1888.
United Kingdom ...	43,000,	42,700,	42,740,	42,740,*
Continent of Europe ...	22,750,	22,900,	23,180,	23,380,
United States	13,250,	13,350,	13,500,	13,525,
India	2,145,	2,260,	2,420,	2,490,
Total ...	81,145,	81,210,	81,840,	82,135,

584. The following are the quantities of cotton consumed in the same countries during the ten years ended with 1887-8. The figures express substantially the world's consumption of that staple in the years named :— World's consumption of cotton.

World's Consumption of Cotton, 1879 to 1888.

(00,000's omitted.)

Years.	Quantity of Cotton Consumed in—				
	United Kingdom.	Continent of Europe.	United States.	India.	Total.
	lbs.	lbs.	lbs.	lbs.	lbs.
1878-9	1,137,2	1,038,4	713,6	104,9	2,994,1
1879-80	1,340,0	1,100,0	792,4	120,6	3,353,0
1880-81	1,428,8	1,182,4	847,2	148,6	3,607,0
1881-2	1,456,0	1,279,2	878,8	155,8	3,769,8
1882-3	1,497,6	1,352,0	950,0	179,0	3,978,6
1883-4	1,466,4	1,352,0	897,6	208,3	3,924,3
1884-5	1,373,2	1,302,0	763,6	233,9	3,672,7
1885-6	1,451,2	1,386,0	911,2	252,1	4,000,5
1886-7	1,477,6	1,456,0	969,2	284,7	4,187,5
1887-8	1,536,4	1,508,0	1,012,0	300,0	4,356,4

585. Thirty-three soap and candle works were returned in both 1890 and in 1891, but the hands employed increased by 28. The weight of soap made in the year under review was less by 11,327 cwt. than that in the previous year, but the weight of candles made was greater by 982 cwt. than in 1890, whilst the valuation placed upon the machinery, lands, and buildings was higher by £41,110 than in that year:— Soap and candle works.

* According to a return published in *The Manufacturer and Inventor* (a London industrial newspaper), of the 20th October, 1890, the number of textile factories in the United Kingdom is 7,190, in which 48,409,733 spinning spindles or throwing spindles, 5,231,329 doubling spindles, and 822,489 power looms are used; whilst the number of hands employed is 1,084,631, viz., 428,082 males and 656,549 females.

Soap and Candle Works, 1890 and 1891.

Year ended March.	Number of Establishments.	Establishments employing— Steam-power.	Gas power.	Manual Labour only.	Amount of Horse-power of Machinery.	Number of Hands employed.	Soap made.	Candles made.	Approximate Total Value of— Machinery and Plant.	Lands.*	Buildings.
							cwt.	cwt.	£	£	£
1890 ...	33	24	...	9	532	399	159,570	50,999	70,090	76,560	51,060
1891 ...	33	21	1	11	386	427	148,243	51,981	95,710	84,410	58,700
Increase	...	...	1	2	...	28	...	982	25,620	7,850	7,640
Decrease	...	3	...	...	146	...	11,327	...	...	...	..

NOTE.—In addition to the other manufactures, 8,880 cwt. of soda crystals were made in 1890, and 10,120 cwt. in 1891.

Value of articles used and produced.

586. The value of the raw material used, and of the articles produced, in soap and candle factories was returned for the twelve months preceding the last two censuses, with the following result:—

Soap and Candle Works, 1881 and 1891.

	1880-81.		1890-91.
Value of raw materials used ...	£288,340	... ...	£229,903
„ articles produced ...	450,924	... ...	348,316
Increased value ...	£162,584, or 56 per cent.		£118,413, or 52 per cent.

Tobacco manufactories.

587. The tobacco manufactories returned were 3 less in 1891 than in 1890, and the hands employed decreased by 64, viz., 29 males and 35 females. The tobacco manufactured, however, increased by 128,171 lbs., and the snuff manufactured by 586 lbs.; on the other hand there was a falling off of over a million in the number of cigars made, and of $1\frac{2}{5}$ million in the number of cigarettes made. The value of lands, buildings, and plant in use was set down as less by £16,421 in 1891 than in 1890:—

Tobacco Manufactories, 1890 and 1891.

Year ended March.	Number of Establishments.	Establishments employing— Steam-power.	Gas-power.	Manual Labour.	Amount of Horse-power of Machinery.	Number of Hands employed. Males.	Females.	Quantity of— Tobacco Manufactured.	Snuff Manufactured.	Number of Cigars Manufactured.	Approximate Total Value of— Machinery and Plant.	Lands.	Buildings.
								lbs.	lbs.		£	£	£
1890 ..	16	4	1	11	59	593	247	1,067,455	1,533	14,320,340	38,550	74,250	53,700
1891 ..	13	4	1	8	79	564	212	1,195,626	2,119	13,255,000	41,365	48,814	59,900
Increase ..	..	..	..	..	20	..	..	128,171	586	..	2,815	..	6,200
Decrease ..	3	..	..	3	..	29	35	..	..	1,065,340	..	25,436	..

NOTE.—In addition to the other manufactures, 6,266,000 cigarettes were made in 1890, and 4,854,000 in 1891.

* The figures in this column apply to purchased land only. Two of these establishments in both years were on Crown lands. In these cases no valuation of the land is given.

588. According to the returns of the last two censuses the value of the materials used and articles produced in tobacco manufactories was as follows in 1881 and 1891 :— Value of raw and manufactured materials.

TOBACCO MANUFACTORIES, 1881 AND 1891.

	1880-81.	1890-91.
Value of materials used	£126,450	£118,070
,, articles produced	199,320	239,627
Increased value	£72,870, or 58 per cent.	£121,557, or 103 per cent.

589. Six distilleries were returned both in 1891 and 1890. An increase took place of 39 in the number of hands employed, of nearly 94,000 gallons in the quantity of spirits made, and of £14,640 in the value of plant, lands, and buildings. The following are the figures for the two years :— Distilleries.

DISTILLERIES, 1890 AND 1891.

Year ended March.	Number of Distilleries.	Amount of Horse-power of Machinery.	Number of Hands employed.	Spirits made.	Approximate Value of—		
					Machinery and Plant.	Lands.	Buildings and Improvements.
				gallons.	£	£	£
1890 ...	6	127	93	425,431	76,500	52,500	43,000
1891 ...	6	109	132	519,078	57,000	70,140	59,500
Increase ...	...	...	39	93,647	...	17,640	16,500
Decrea se...	...	18	...	...	19,500	...	...

590. According to the following figures, which (except those for the Australasian colonies) have not been got from an official source, and therefore must be taken only for what they may be worth, the average consumption of spirits per head appears to be much the greatest in Denmark and Sweden. Moreover, the consumption in Victoria is less than in New South Wales (slightly), Western Australia, or Queensland, but greater than in New Zealand, Tasmania, or South Australia, the latter two of which colonies stand at the very bottom of the list :— Consumption of spirits in various countries.

ANNUAL CONSUMPTION OF SPIRITS PER HEAD IN VARIOUS COUNTRIES.

	Gallons.		Gallons.
Denmark ...	4·30	Holland ...	2·08
Sweden ...	4·20	Russia* ...	1·65
Scotland ...	2·10	Queensland ...	1·59

* It is believed that the actual consumption in Russia is larger, and that much privately distilled spirits are consumed which are not taken into account.

Annual Consumption of Spirits per Head in Various Countries—*continued.*

	Gallons.		Gallons.
Western Australia ...	1·46	Germany	·95
United States	1·34	France	·85
Ireland	1·33	New Zealand	·78
Canada	1·19	England	·77
New South Wales ...	1·15	Austria-Hungary ...	·63
Victoria	1·12	Tasmania	·59
Switzerland	1·04	South Australia ...	·49
United Kingdom ...	1·00		

Other manufactories, works, etc.

591. The manufactories and works, exclusive of those of which mention has already been made—viz., flour mills, breweries, distilleries, brickyards, potteries, tanneries, fellmongeries, wool-washing establishments, woollen mills, soap and candle works, and tobacco manufactories—were less numerous by 20 than those returned in 1890. It will be observed that the establishments employing water-power decreased by 1, those employing horse-power also by 1, and those employing only manual labour by 46; whilst there was an increase of 28 in those worked with the aid of steam and gas. The males employed decreased by 1,391, and the females employed increased by 446; whilst the value of lands, buildings, and plant shows an increase of £615,875. The totals of the two years are subjoined :—

Manufactories, Works, etc., 1890 and 1891.

(Exclusive of Flour Mills, Breweries, Distilleries, Brickyards, Potteries, Tanneries, Fellmongeries, Wool-washing Establishments, Woollen Mills, Soap and Candle Works, and Tobacco Manufactories.

Year ended March.	Number of Manufactories, Works, etc.	Manufactories, etc., employing—						Horse-power of Machinery
		Steam.	Water.	Gas.	Wind	Horse-power.	Manual Labour only	
1890 ...	2,528	1,071	19	301	2	24	1,111	18,623
1891 ...	2,508	1,080	18	320	2	23	1,065	19,749
Increase	...	9	...	19	...	...	...	1,126
Decrease	20	...	1	...	...	1	46	...

Year ended March.	Number of Hands employed.		Approximate Total Value of—		
	Males.	Females.	Machinery and Plant.	Lands.*	Buildings.
			£	£	£
1890	40,719	7,693	4,637,043	3,937,624	3,078,688
1891	39,328	8,139	5,035,493	4,033,656	3,200,081
Increase ...	...	446	398,450	96,032	121,393
Decrease ...	1,391	...	...	...	...

Note.—Exclusive of stone-breaking and tar-pavement works, which numbered 19 in 1890 and 23 in 1891. These works being carried on in connexion with quarries, it is found impossible to separate them therefrom. See table following paragraph 596 *post*.

* In the case of establishments standing upon Crown lands no estimate of the value of the land is given. The number of such establishments was 197 in 1890 and 204 in 1891.

592. By summarizing the returns of manufactories and works of all descriptions, including not only such as are embraced in the foregoing table, but also those excluded therefrom—viz., flour mills, breweries, distilleries, brickyards, potteries, tanneries, fellmongeries, wool-washing establishments, woollen mills, soap and candle works, and tobacco manufactories—it is found that during 1890-91 the total number of establishments decreased by 33, and the hands employed by 1,063; those of them which use steam or gas increased by 23, the amount of horse-power by 1,491, and the value of machinery, lands, and buildings by £1,161,384. The returns of the two years are contained in the following table:— Manufactories of all descriptions.

MANUFACTORIES, WORKS, ETC., 1890 AND 1891.

(Including Flour Mills, Breweries, Distilleries, Brickyards, Potteries, Tanneries, Fellmongeries, Wool-washing Establishments, Woollen Mills, Soap and Candle Works, and Tobacco Manufactories, as well as all other Manufactories, Works, etc.)

Year ended March.	Total Number of Establishments.	Number of Establishments using Steam or Gas Engines.	Horse-power of Machinery.	Number of Hands employed.	Approximate Value of Lands,* Buildings, Machinery, and Plant.
					£
1890 ...	3,137	1,717	27,683	57,432	15,612,064
1891 ...	3,104	1,740	29,174	56,369	16,773,448
Increase ...	...	23	1,491	...	1,161,384
Decrease ...	33	..	...	1,063	...

593. The manufacturing establishments of all kinds respecting which returns are obtained are named in the following table, and their numbers are given for 1891 and for the first year of each of the two previous quinquennia; also the number of hands employed, and the approximate value of materials used and produced, and of plant, lands, and buildings, during 1891. The establishments are generally of an extensive character, the exceptions being in cases where the existence of industries of an unusual or interesting nature might seem to call for notice, or where machinery worked by steam, gas, or water is used. No attempt is made to enumerate mere shops, although some manufacturing industry may be carried on thereat. Were this done, the "manufactories" in the colony might be multiplied to an almost indefinite extent:— Names of manufactories.

* In the case of establishments standing upon Crown lands no estimate of the value of the land is given. The number of such establishments was 238 in 1890 and 245 in 1891.

Manufactories, Works, etc., 1881, 1886, and 1891.

Description of Manufactory, Work, etc.	Number of Establishments.			1890-91.			
	1880-81.	1885-86.	1890-91.	Number of Hands employed.	Approximate Value of— Materials used.	Articles produced.	Lands, Buildings, Machinery, and Plant.
					£	£	£
Books and Stationery.							
Account-book manufactories, manufacturing stationers	7	7	11	1,027	152,360	248,900	234,270
Printing and lithographic printing establishments*	89	139	162	4,003	459,858	1,363,086	1,198,051
Photo-lithographic works	...	...	1	...	...	...	...
Musical Instruments.							
Organ-building establishments ...	2	4	3	35	6,300	10,100	7,000
Pianoforte manufactories	5	4	3	12	750	1,900	2,500
Carving Figures, etc.							
Wood carving and turnery works ...	10	18	15	59	3,595	9,710	17,122
Designs, Medals, and Dies.							
Die-sinkers, engravers, medalists, trade-mark makers	6	6	8	130	5,635	14,149	32,795
Indiarubber stamp manufactories † ...	2	...	...	...	...	...	...
Type foundry	1	...	...	...	...	...	...
Philosophical Instruments, etc.							
Electric-lighting apparatus manufactory	...	1	3	18	1,420	3,450	6,850
Philosophical instrument manufactories	1	4	2	9	540	900	3,350
Surgical Instruments.							
Surgical instrument, truss—manufactories	6	4	4	23	1,056	4,806	11,125
Arms, Ammunition, etc.							
Blasting powder, dynamite, etc.—manufactories	3	6	6	66	14,804	27,070	48,655
Fuze manufactory	1	1	1	...	...	...	...
Shot manufactories	...	2	2	4	1,600	2,184	5,443
Machines, Tools, and Implements.							
Agricultural implement manufactories	54	55	71	1,090	263,714	692,125	198,159
Boiler and pipe-covering manufactories	...	...	1	...	...	...	...
Cutlery, tool—manufactories ...	3	5	9	55	10,350	26,110	29,935
Domestic implement‡ manufactories ...	2	8	6	56	4,500	14,400	9,380
Iron foundries and engineering establishments §	147	148	190	8,019	1,166,516	2,480,941	1,598,865
Nail manufactories	...	2	4	36	15,810	22,692	18,000

* Including paper-bag manufactories.

† Indiarubber stamps are now generally made by manufacturing stationers. See Books and Stationery above.

‡ Including bellows, churn, washing-machine, etc., makers.

§ Including brass-founders.

MANUFACTORIES, WORKS, ETC., 1881, 1886, AND 1891—*continued.*

Description of Manufactory, Work, etc.	Number of Establishments.			1890-91.			
	1880-81.	1885-86.	1890-91.	Number of Hands employed.	Approximate Value of— Materials used.	Articles produced.	Lands, Buildings. Machinery, and Plant,
MACHINES, TOOLS, AND IMPLEMENTS—*continued.*					£	£	£
Pattern-makers	...	5	5	16	1,000	5,470	9,275
Sheet-iron and tin works	61	50	53	749	119,644	240,000	201,090
CARRIAGES AND HARNESS.							
Carriage lamp manufactories ...	3	2	2	15	1,500	3,800	5,000
Coach, waggon, etc.—manufactories ...	132	174	205	2,781	238,096	506,625	439,527
Perambulator manufactories ...	3	4	2	10	620	1,869	3,560
Saddle, harness—manufactories ...	47	63	73	637	80,423	154,076	121,404
Saddle-tree, etc., manufactories ...	4	4	3	31	1,350	4,400	10,780
Whip manufactories	3	2	3	19	2,610	7,400	3,835
SHIPS AND BOATS.							
Ship, boat—builders	10	12	10	61	3,999	10,957	10,370
Ships' wheels, blocks, etc.—manufactories	3	1	1	...	...	...	...
Floating-dock	1	7	7	193	...	...	426,875
Graving-docks	3						
Patent slips	2						
HOUSES, BUILDINGS, ETC.							
Architectural modelling works * ...	13	10	13	88	4,557	11,788	35,220
Enamelled mantelpiece manufactories.	...	2	5	54	8,820	18,800	9,490
Lime and cement works	21	35	34	333	14,361	46,868	27,700
Roof-covering composition manufactories	2	...	...	...	...	...	...
Venetian blind manufactories ...	12	12	9	116	16,293	21,866	20,955
Earth-closet manufactories	1	3	2	22	2,200	7,495	7,050
FURNITURE.							
Bedding, flock, and upholstery manufactories	15	25	33	378	89,532	118,859	99,655
Bedstead manufactory	...	1	1	...	...	...	...
Cabinet works, including billiard-table makers	63	75	71	1,473	141,589	321,892	275,166
Iron-safe manufactories	2	2	2	25	1,600	4,800	8,800
Looking-glass manufactories ...	2	2	4	43	13,968	21,200	29,000
Picture-frame makers, etc.	13	7	9	55	13,582	17,248	16,915
CHEMICALS.							
Chemical works	6	10	15	253	57,080	151,362	125,195
Dye works	6	12	5	15	238	1,397	4,430
Essential oil manufactories	4	7	12	139	6,660	19,090	18,050
Ink, blacking, blue, washing-powder, etc.—manufactories	12	7	7	150	43,658	79,950	19,560
Japanning works	...	1	1	...	...	...	...

* Including ventilator manufactories.

MANUFACTORIES, WORKS, ETC., 1881, 1886, AND 1891—*continued.*

Description of Manufactory, Work, etc.	Number of Establishments.			1890-91.			
	1880-81.	1885-86.	1890-91.	Number of Hands employed.	Approximate value of— Materials used.	Articles produced.	Lands, Buildings, Machinery, and Plant.
					£	£	£
CHEMICALS—*continued.*							
Paint, varnish—manufactories ...	1	1	2	11	6,990	17,000	19,250
Printing ink manufactories... ...	...	3	2	22	4,000	8,500	12,100
Salt works	8	5	4	32	250	1,500	4,230
TEXTILE FABRICS.							
Woollen mills	10	9	7	791	94,932	170,687	219,775
DRESS.							
Boot manufactories	105	91	92	3,787	476,366	844,202	226,950
Clothing factories...	63	73	105	5,536	621,671	1,127,887	419,650
Fur manufactories	3	5	8	56	20,470	37,665	13,175
Hat, cap—manufactories	22	23	17	471	44,569	93,058	73,089
Hosiery manufactories	...	3	3	63	6,160	10,145	8,490
Oilskin, waterproof-clothing—manufactories	5	5	5	115	24,620	48,800	19,780
Umbrella and parasol manufactories	9	8	10	158	37,542	59,620	18,030
Wig manufactory...	1	...	...	...	...	...	...
FIBROUS MATERIALS.							
Rope, twine, mat, bag, sack—manufactories	18	14	13	396	161,356	227,122	121,058
Sail, tent, tarpaulin—manufactories ...	12	13	9	81	70,162	85,431	23,515
ANIMAL FOOD.							
Butter factories	...	...	32	108	80,549	118,486	83,285
Cheese factories*	28	22	20	82	23,595	43,856	41,511
Meat-curing establishments ...	16	24	24	328	200,530	281,100	125,570
VEGETABLE FOOD.							
Biscuit manufactories	13	7	7	627	157,816	283,716	143,190
Confectionery works	8	12	13	362	79,920	147,450	98,450
Flour mills	144	134	104	800	1,620,125	2,043,604	691,382
Jam, pickle, vinegar, sauce—manufactories	25	30	17	404	77,624	137,069	98,114
Macaroni works	2	1	1	...	...	...	...
Maizena, oatmeal, starch — manufactories†	5	1	4	176	129,200	153,800	146,310
Milk condensing	...	...	1	...	...	...	...
DRINKS AND STIMULANTS‡							
Aërated waters, gingerbeer, liqueur, etc.—works	114	139	160	1,056	195,997	365,930	364,382

* A large quantity of cheese and butter is made on dairy farms which are not returned as factories, and therefore are not included in this table. Some of these have steam engines, and use cream separators and other machinery. It was ascertained that in 1890 as many as 14,112 hands were employed in such establishments exclusively on dairy work.

† Some of these factories also make coffee, cocoa, spice, etc.

‡ Places where wine is made are not included. The number of wine-presses returned in 1890-91 was 571.

MANUFACTORIES, WORKS, ETC., 1881, 1886, AND 1891—*continued.*

Description of Manufactory, Work, etc.	Number of Establishments.			1890-91.			
	1880-81.	1885-86.	1890-91.	Number of Hands employed.	Approximate value of— Materials used.	Articles produced.	Lands, Buildings. Machinery, and Plant.
DRINKS AND STIMULANTS*—*continued.*					£	£	£
Breweries	81	74	68	1,185	491,932	971,489	1,554,022
Coffee, chicory, cocoa, mustard, spice—works†	12	14	13	126	35,587	60,322	115,020
Distilleries	6	7	6	132	41,469	106,937	186,640
Malthouses	14	15	16	125	166,515	217,596	146,325
Sugar, treacle—refineries	1	2	3	264	435,000	575,000	190,500
Tobacco, cigars, snuff—manufactories	16	12	13	776	118,070	239,627	150,079
ANIMAL MATTERS.							
Boiling-down, tallow-rendering—establishments	15	20	14	80	70,578	92,252	32,290
Bone mills and bone manure manufactories	15	12	11	73	27,955	53,380	28,955
Brush manufactories	8	8	8	162	23,680	47,750	20,265
Comb manufactory	1	...	...	...	...	...	...
Catgut manufactories	2	1	1	...	...	...	...
Curled hair manufactories	3	1	4	27	5,000	10,400	8,890
Glue, oil—manufactories	7	6	3	29	3,221	5,246	11,350
Leather belting (machinery) manufactory	...	1	2	14	11,372	14,972	8,060
Morocco, fancy leather—manufactories	3	4	5	39	6,925	16,700	4,100
Ostrich feather factory	...	1	...	...	...	...	...
Portmanteau, trunk—manufactories ...	7	8	7	33	3,620	7,498	12,612
Soap, candle—works	38	33	33	427	229,903	348,316	238,820
Tanneries, fellmongeries, and wool-washing establishments	151	152	132	1,669	793,679	1,226,853	425,653
VEGETABLE MATTERS.							
Bark mills	8	3	6	46	26,700	37,100	6,082
Basket-making works	9	12	11	85	4,940	18,182	16,275
Broom manufactories‡	2	2	3	40	16,200	20,100	8,860
Chaff-cutting, corn-crushing—works§	165	201	220	1,027	544,314	738,941	303,019
Cooperage works	24	26	30	181	23,667	47,405	59,860
Cork manufactories	2	1	3	11	4,400	9,164	7,330
Fancy-box, hat-box—manufactories ...	5	6	6	89	7,940	16,763	21,820
Paper manufactories	3	2	2	160	27,500	61,000	105,000
Sawmills, moulding, joinery, etc.—works	174	256	321	5,440	1,127,857	2,600,298‖	1,198,675
Straw board manufactories	...	...	1	...	...	...	...

* Places where wine is made are not included. The number of wine presses returned in 1890-91 was 571.

† See footnote (†) on previous page.

‡ See also Brush factories under Animal Matters, *ante*.

§ All these establishments used machinery worked by steam, wind, or horse power. They must not be confounded with chaff-cutting and grain-crushing machines in use on farms, which numbered 18,860.

‖ Including £608,759, value of timber sawn from Victorian logs.

Manufactories, Works, etc., 1881, 1886, and 1891—*continued.*

Description of Manufactory, Work, etc.	Number of Establishments.			1890-91.			
	1880-81.	1885-86.	1890-91.	Number of Hands employed.	Approximate value of— Materials used.	Articles produced.	Lands, Buildings, Machinery, and Plant.
Coal and Lighting.					£	£	£
Gasworks	19	21	30	858	288,967	628,867	1,841,134
Electric-light works	...	1	4	48	4,100	18,500	45,670
Ironfounders' charcoal factory ...	...	1	1	...	...	...	...
Stone, Clay, Earthenware, and Glass.							
Artificial stone manufactory ...	...	1	...	...	...	...	...
Asphalt paving material works ...	...	...	2	27	3,690	8,250	3,140
Asbestos works	...	1	1	...	...	...	...
Brickyards and potteries	165	227	233	3,122	...	534,284	1,037,847
Cement tile works	...	...	1	...	...	...	...
Filter manufactories	1	3	2	11	2,000	4,000	4,350
Glass manufactories, works ...	9	4	6	224	7,190	42,000	43,870
Stone-breaking, asphalt, tar-pavement —works*	9	...	...	...	...	...	...
Stone and marble sawing, polishing—works	43	43	54	895	109,558	228,187	117,213
Water.†							
Ice manufactories	2	3	6	41	4,536	8,354	43,845
Gold, Silver, and Precious Stones.							
Goldsmiths, jewellers, and electro-platers (manufacturing)	28	22	26	404	142,447	190,675	113,295
Royal mint	1	1	1	54	...	...	‡ 68,000
Metals other than Gold and Silver.							
Bell foundry	1	...	...	...	...	...	...
Brass and copper works—gasalier manufactories	...	18	26	373	29,446	65,885	105,805
Lead, pewter, and zinc—works ...	5	2	4	27	24,688	47,032	37,420
Pyrites works	1	1	1	...	...	...	...
Smelting works	7	3	3	47	14,122	18,300	29,000
Wire-working establishments ...	10	9	12	103	9,670	24,256	27,780
Total where only one return was received§	...	...	...	135	11,163	22,007	72,889
Total	2,468	2,813	3,104	56,369	12,006,233	22,390,251	16,773,448

* Now included under the head of Stone Quarries—*post.*

† Works for the storage and supply of water are not included in the manufacturing tables. For information relating to these, see paragraph 508 *et seq.*

‡ Exclusive of land, estimated at £85,000.

§ The particulars of these have been combined in accordance with a promise made that the contents of individual schedules would not be published.

Value of materials used and produced.

594. In 1891, which was the year of the census, an enquiry was made respecting the value of the materials used and articles produced in all manufactories. These enquiries were responded to in most instances, and in cases where the information was not given the values have been estimated upon the same proportions as obtained in similar works respecting which information was supplied. The result is given in the two columns preceding the final one of the last table. The totals and difference between them—to which has been added an estimate for the value of the bricks and pottery made—together with similar results for the previous census year are as follow :—

VALUE OF RAW AND MANUFACTURED MATERIALS, 1881 AND 1891.

	1880-81.		1890-91.	
	£		£	
Value of materials operated upon	7,997,745	...	12,006,233	
„ articles produced	13,370,836	...	22,390,251	
Increased value ...	5,373,091,	or 67 per cent.	10,384,018,	or 86 per cent.
Bricks at £1 per 1,000	53,566	...	241,928	
Value of pottery	34,600	...	68,160	
Total value of manufactured articles, less cost of raw material	5,461,257	...	10,694,106	

Summary of manufactories at three periods.

595. By comparing the particulars respecting these manufactories, as returned in 1891 and in the first year of each of the two previous quinquennia, considerable increases at each successive period will be found in all the columns. The number of establishments increased by 14 per cent. between 1881 and 1886, and by 10 per cent. between 1886 and 1891; the hands employed increased by 29 per cent. and 14 per cent. in those intervals respectively; and the value of machinery, plant, lands, and buildings increased by 46 per cent. in the first, and by 54 per cent. in the second, interval. The following is the comparison referred to :—

SUMMARY OF MANUFACTORIES, WORKS, ETC., 1881, 1886, AND 1891.

Year ended March.	Total Number of Establishments.	Number of Establishments using Steam or Gas Engines.	Horse-power of Engines.	Number of Hands employed.	Approximate Value of Lands, Buildings, Machinery, and Plant.
					£
1881 ...	2,468	1,048	14,502	38,141	7,465,328
1886 ...	2,813	1,409	20,160	49,297	10,907,885
1891 ...	3,104	1,740	29,174	56,369	16,773,448

Stone quarries.

596. The stone quarries, stone-crushing, and tar-pavement works returned in 1891 were greater by 21 than in 1890, and the hands employed were greater by 57. The output of stone increased by 285,837 cubic yards, and a substantial increase also appears in the power of steam engines, and in the value of plant, lands, and buildings. The following are the figures for the two years:—

STONE QUARRIES,* ETC., 1890 AND 1891.

Year ended March.	Number of Quarries, etc.	Cubic Yards of Stone raised.					Steam Engines in use.	
		Bluestone.	Slate and Flagging.	Sandstone and Freestone.	Granite.	Other.	Number.	Horse-power.
1890	171	749,656	3,476	29,556	600	...	26	864
1891	192	1,051,890	2,200	13,025	510	1,500	27	904
Increase	21	302,234	...	...	...	1,500	1	40
Decrease	...	...	1,276	16,531	90	...	...	...

Year ended March.	Number of Hands employed.	Approximate Total Value of—			
		Stone raised.	Machinery and Plant.	Lands.†	Buildings.
		£	£	£	£
1890	1,749	208,410	78,118	88,785	14,843
1891	1,806	297,990	109,905	109,686	36,864
Increase	57	89,580	31,787	20,901	22,021
Decrease	...	...	...	...	...

Manufactories, works, etc., in Victoria and New South Wales.

597. According to the official returns, the manufactories and works (including stone quarries) in Victoria exceeded those in New South Wales by 677, and the hands employed were also more numerous by 11,650. The number of works and hands employed therein in the two colonies are placed side by side in the following table :—

MANUFACTORIES, WORKS, ETC., IN VICTORIA AND NEW SOUTH WALES, 1891.

Description of Manufactory, Work, etc.	Number of Establishments.		Hands Employed.	
	Victoria.	New South Wales.	Victoria.	New South Wales.
BOOKS AND STATIONERY.				
Manufacturing stationers, including rubber-stamp makers	12	18	1,063	674
Printing and lithographic printing establishments	163	113	4,022	3,393

* Including stone-crushing and tar-pavement works.

† The figures in this column apply to purchased land only. 47 of the stone quarries in 1891, and 39 in 1890, were on Crown lands, and in these cases no valuation of the land has been given.

MANUFACTORIES, WORKS, ETC., IN VICTORIA AND NEW SOUTH WALES, 1891—*continued.*

Description of Manufactory, Work, etc.	Number of Establishments.		Hands Employed.	
	Victoria.	New South Wales.	Victoria.	New South Wales.
MUSICAL INSTRUMENTS, ETC.				
Organ builders	3	...	35	...
Pianoforte makers	3	...	12	...
CARVING, ENGRAVING, ETC.				
Wood-carving, turnery works	15	...	59	...
Die-sinkers, engravers	8	7	130	28
PHILOSOPHICAL INSTRUMENTS, ETC.				
Philosophical and surgical instrument makers	9	8	50	67
ARMS, AMMUNITION, ETC.				
Blasting-powder, dynamite, and fuze makers	7	...	84	...
Shot manufacturers	2	...	4	...
MACHINES, TOOLS, AND IMPLEMENTS.				
Agricultural implement makers	71	17	1,090	304
Domestic implement manufactories ...	6	...	56	...
Engine and machine makers, iron and brass founders	217	159	8,395	3,550
Sheet, galvanized iron, tin, lead, zinc, pewter, type works	57	74	776	869
Nail manufacturers	4	...	36	...
Cutlery, tool makers	9	...	55	...
Pattern makers	5	...	16	...
CARRIAGES AND HARNESS.				
Carriage lamp, etc., manufactories ...	2	...	15	...
Coach, waggon, perambulator builders ...	207	156	2,791	5,632
Saddle, saddle-tree, whip makers	79	42	687	483
SHIPS AND BOATS.				
Ship, boat builders, block makers ...	11	22	62	518
Graving docks, patent slips, etc. ...	7	5	193	463
HOUSES AND BUILDINGS.				
Architectural modellers, etc.	13	9	88	47
Lime and cement works	34	8	333	125
Venetian blind makers	9	8	116	81
Enamelled mantelpiece makers	5	...	54	...
FURNITURE.				
Bedding manufacturers	33	5	378	103
Furniture, cabinet works	72	72	1,476	938
Picture frame makers	9	9	55	47
Earth-closet makers	2	...	22	...
Iron safe makers	2	...	25	...
Looking-glass makers	4	...	43	...

Manufactories, Works, etc., in Victoria and New South Wales, 1891—*continued.*

Description of Manufactory, Work, etc.	Number of Establishments.		Hands Employed.	
	Victoria.	New South Wales.	Victoria.	New South Wales.
Chemicals.				
Chemical works	15	8*	253	114
Dye works	5	8	15	46
Ink, printing ink, blacking, blue, washing powder, baking powder manufactories	9	2	172	15
Essential oil factories	12	...	139	...
Paint, varnish, japanning works	3	3	17	17
Salt works	4	...	32	...
Textile Fabrics and Dress.				
Woollen mills	7	4	791	155
Boot factories	92	60	3,787	2,806
Clothing factories	105	21	5,536	2,698
Fur manufactories	8	2	56	10
Hat, cap factories	17	10	471	74
Oil-skin, waterproof clothing makers ...	5	7	115	257
Umbrella, parasol makers	10	1	158	5
Hosiery manufacturers	3	...	63	...
Fibrous Materials.				
Rope, twine, mat, bag, sack makers ...	13	11	396	175
Sail, tent, tarpaulin makers	9	14	81	94
Animal Food.				
Meat, fish, curing, preserving works ...	24	6	328	320
Butter and cheese factories (steam) ...	53	142	200	778
„ „ „ (hand or other power)	...†	149	...†	785
Vegetable Food.				
Maizena, oatmeal, starch, macaroni makers, rice dressers, etc.	5	2	179	28
Biscuit manufactories	7	10	627	544
Confectionery works	13	16	362	359
Flour mills	104	74	800	541
Fruit preserving, jam, pickle, sauce, condiment, vinegar works	17	18	404	314
Drinks and Stimulants.				
Aërated waters, liqueur, cordial works ...	160	104	1,056	897
Breweries	68	41‡	1,185	784
Distilleries	6	1	132	11
Coffee, chocolate, mustard, spice works ...	13	6	126	249
Sugar refineries	3	1	264	300
Sugar (raw) works	...	33	...	1,621
Tobacco, cigars, snuff manufacturers ...	13	9	776	678
Malthouses	16	...	125	...

* Including 2 poudrette and ammonia factories.

† In Victoria a large quantity of cheese and butter is made on dairy farms (which are not returned as factories); of which 1,052 are returned as using machinery, in many cases worked by steam power. The machines in use consist of 238 cream-separators, 495 butter workers, 240 cheese-making, and 810 cheese presses. It was ascertained that in 1890 as many as 14,112 hands were employed in such establishments exclusively on dairy work. See also paragraph 540 *ante*.

‡ Including bottling works.

Manufactories, Works, etc., in Victoria and New South Wales, 1891—*continued.*

Description of Manufactory, Work, etc.	Number of Establishments.		Hands Employed.	
	Victoria.	New South Wales.	Victoria.	New South Wales.
Animal Matters.				
Boiling down, tallow melting, glue making works	18	28	121	283
Bone mills, bone manure works	11	3	73	24
Brush, broom factories	8	5	162	39
Curled hair, flock manufactories	4	4	27	23
Portmanteau, trunk makers	7	3	33	31
Leather belting, morocco, fancy leather, catgut factories	7	3	53	12
Soap, candle works	33	27	427	194
Tanneries, fellmongeries, woolwashing works	132	125	1,669	1,739
Vegetable Matters.				
Bark mills	6	1	46	8
Basket makers	11	6	85	47
Broom (millet) factories	3	3	40	29
Chaff cutting, corn crushing works ...	220	49	1,027	250
Cooperage works	30	10	181	143
Fancy box, hat box manufactories ...	6	...	89	...
Paper manufactories	2	1	160	65
Saw mills, moulding, joinery, packing case, cork cutting works	324	410	5,451	4,804
Coal and Lighting.				
Electric light works	4	11	48	43
Gas, coke works	31	35	866	1,188
Kerosene, oil works	...	3	...	314
Stone, Clay, and Glass.				
Stone quarries,* stone crushing, dressing works, asphalt, pavement works	194	49	1,833	486
Brickyards, potteries	233	208	3,122	2,341
Glass works	6	9	224	126
Stone, marble—sawing, polishing, monumental works	54	39	895	320
Artificial stone, asbestos, cement tile, filter works	4	...	22	...
Water.				
Ice manufactories, refrigerating works ...	6	9	41	195
Gold, Silver, and Precious Stones.				
Goldsmiths, jewellers, gold beaters, electro-platers, mother-of-pearl workers	26	29	404	186
Mint	1	1	54	42
Metals other than Gold and Silver.				
Smelting, pyrites works	4	20	52	1,222
Wire working establishments	12	9	103	170
Other works	...	24	...	204
Total	3,296	2,619	58,175	46,525

* In making comparisons it has been found impossible to separate stone quarries from the other works carried on in connexion therewith. They are, therefore, necessarily included in this table.

Royal Commission on gold mining.

598. A Royal Commission was appointed on the 15th July, 1889, to inquire into and report as to the best mode in which assistance could be rendered to develop the auriferous resources of the colony; and, accordingly, there were presented to Parliament in due course two progress reports and a final report, dated respectively 17th December, 1890, April, 1890, and 30th September, 1891*. At the outset, the commission proposed to consider the question under three heads of inquiry:—(1) What are the causes that have led to the decline in the production of gold? (2) What steps should be taken to place the administration of the auriferous areas on a better footing? and (3) what general principles should be observed in promoting the success of gold mining? They attribute the gradual decline in the gold yield—viz., from 2,985,735 oz. in 1856 to 614,839 oz. in 1889—to the working out of the shallow but rich alluviums in the early days, first by armies of eager, energetic, industrious and intelligent men from all parts of the world, and afterwards by large numbers of Chinese, who re-worked the abandoned goldfields; to the difficulties and expense of quartz-mining, and the limited employment that could be given owing to lack of capital; to the spread of agricultural settlement; and, as subsidiary causes, to the "shepherding" of mining lands, and the gambling in shares. It is pointed out, however, that nearly as much is earned now per miner at work as in 1856, notwithstanding the decrease in the total yield, the figures being £105 18s. in 1856 and £101 2s. in 1889. The following is a summary of the recommendations embodied in the final report:—

Recommendations of Royal Commission on Gold Mining, 1891.

1. That the mining and prospective boards, as at present constituted, should be abolished.

2. That bodies, to be called "Mining Councils," should be established; and that, in addition to their exercising the powers and functions now performed by mining and prospecting boards, they should take cognisance of, and exercise a general oversight regarding, all matters affecting mining, such as the conservation and growth of timber in the mining areas, the observance of labour covenants, and to inquire into and report to the Minister in all cases where "shepherding" is suspected.

3. That the basis of the election of such councils should be:—Every male adult interested in mining to be entitled to the issue of an electoral miner's right, cost not to exceed sixpence. All persons desiring to obtain such rights to apply in person, and the right to vote not to be exercised except by persons who have held their electoral miners' rights for a term of at least three months. Persons holding miners' rights to be entitled to vote without other qualification.

4. That the present boundaries of the seven mining districts be revised.

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* Parliamentary Papers, Nos. 2, 41, and 151; Session 1891.

5. That the Forest Department be associated with the Mining Department, and the cultivation of forests be undertaken over all mining areas where practicable.

6. That all auriferous areas (including worked-out diggings) be permanently reserved for mining, forest culture, or for cultivation by persons willing to take such lands on lease. No such lands to be leased by the Minister except by the advice of the local mining council.

7. That the geological survey of the colony be completed with all possible expedition, and that the survey of the land yet remaining in the hands of the Crown be proceeded with first.

8. That the acceptance of rent by the Crown should not be a bar to forfeiture.

9. That the Minister should have power to protect any area of ground on the lessees proving to his satisfaction that it was their intention to float the mine on some British or foreign market.

10. That the State should continue to assist prospecting on the lines indicated in our report.

11. That the *Mining on Private Property Act* should be amended in the direction indicated at length in our second progress report.

12. That mining managers should be certificated.

13. That *The Drainage of Mines Act* should be amended as indicated. (See Report.)

14. That steps should be at once taken to enforce the provisions of section 309 of the *Companies Act* 1890, No. 1,074, which provides that five per cent. of the capital of such companies shall be subscribed before registration.

15. That in any application for a lease or water-right licence to which an objection is made, or in any application for forfeiture of any such lease or licence, on receipt of the warden's report, the Minister of Mines shall name a day when any appeal shall be heard by him, and that such cases shall be dealt with in open court, and the decisions given on the same principle as appeals are heard and dealt with under the *Land Act* 1890.

16. That alluvial mining areas of a depth of 100 feet and less shall not be leased in blocks exceeding ten acres, such blocks to be marked off according to the rules provided in the *Mines Act* 1890.

17. That the tribute system may be materially improved in two ways, viz.:— (1) By extending the tenure; and (2) By simplifying the mode of recording agreements between tributers and leaseholders.

18. That negotiations should be opened with the Secretary of State for the Colonies, with the view of obtaining Imperial authority to coin silver at the Melbourne Mint.

19. That a sum of money should be offered for the best system of gold extraction.

20. That precautions should be taken to secure health in mines, as set out in the Report in detail under various heads.

21. That the creation of reserve funds should be provided for in all mines paying dividends.

22. That a perfect mineralogical and lithological collection should be made up, and exhibited as a means of education and for reference.

23. That promoters and directors should be made responsible "for statements contained in prospectuses, and other documents drawn up under their authority."

24. That provision should be made for the storage and conveyance of water by races for mining purposes, and that the drainage of mines in certain cases be provided for out of the prospecting vote.

25. That double-cylinder engines should in all cases be used for winding.

26. That compound condensing engines should be used more extensively to economise fuel.

27. That stone-breakers should be more generally employed.

28. That the State should establish a system of paying premiums for inventions, new appliances, new discoveries, and new marketable products in mining, similar to the system in vogue for the encouragement of agriculture.

29. That the geological survey should be completed at as early a date as possible of all lands yet remaining in the hands of the Crown.

30. That the methods of assisting prospecting should be based on national principles.

31. That careful attention should be paid to the examination of those places indicated in our report as affording good fields for exploration.

Gold raised, 1889 and 1890.

599. According to the estimate of the Mining Department, the gold raised in Victoria in 1890 was 588,561 oz., which is less than the quantity obtained in 1889 by 26,278 oz., representing, at £4 per oz., a decreased value of £105,112. The following are the figures for the two years :—

QUANTITY AND VALUE OF GOLD RAISED IN 1889 AND 1890.

Year.	Gold raised in Victoria.	
	Estimated Quantity.	Value, at £4 per oz.
	oz.	£
1889	614,839	2,459,356
1890	588,561	2,354,244
Decrease ...	26,278	105,112

Gold raised 1871 to 1890.

600. From 1871 to 1879 the quantity of gold raised from year to year had been steadily diminishing, but in the next three years an improvement took place, which, however, has not since been sustained, the yield having again gradually fallen off since 1882, and being less in the last four years than it had been previously since 1851. The subjoined figures give an estimate of the quantity of gold raised in 1871 and each subsequent year :—

ESTIMATED QUANTITY OF GOLD RAISED, 1871 TO 1890.

	oz.		oz.
1871	1,355,477	1881	858,850
1872	1,282,521	1882	898,536
1873	1,241,205	1883	810,047
1874	1,155,972	1884	778,618
1875	1,095,787	1885	735,218
1876	963,760	1886	665,196
1877	809,653	1887	617,751
1878	775,272	1888	625,026
1879	758,947	1889	614,839
1880	829,121	1890	588,561

Gold raised 1851 to 1890.

601. Carrying on to the end of 1890 the calculations given in previous years, the following may be estimated as the total quantity and value of the gold raised in Victoria from the period of its first

discovery about the middle of 1851. The figures give an average per annum during the whole period of about 1,421,000 oz., which is nearly two and a half times the quantity raised in 1890:—

ESTIMATED TOTAL QUANTITY AND VALUE OF GOLD RAISED IN VICTORIA, 1851 TO 1890.

Gold raised in Victoria.	Estimated Quantity.	Value, at £4 per oz.
	oz.	£
Prior to 1890 ...	56,250,798	225,003,192
During 1890 ...	588,561	2,354,244
Total ...	56,839,359	227,357,436

602. Since the first discovery, in 1851, of gold in Australasia, 87 million ounces have been raised in the various colonies, two-thirds of which was got in Victoria. The following is a statement of the quantity recorded as having been raised in the respective colonies during each year. No column is assigned to Western Australia, as, although during the last four or five years gold has been raised in that colony, chiefly in the Kimberley district, no reliable information as to the quantity has ever been obtained:— Gold raised in Australasian colonies.

GOLD PRODUCE IN AUSTRALASIAN COLONIES, 1851 TO 1890.

Year.	Victoria.	New South Wales.	Queensland.	South Australia.	Tasmania.	New Zealand.
	oz.	oz.	oz.	oz.	oz.	oz.
1851	145,137	144,121	...	...	...	...
1852	2,738,484	818,752	...	...	...	...
1853	3,150,021	548,053	...	...	...	...
1854	2,392,065	237,911	...	...	...	...
1855	2,793,065	170,146	...	...	...	...
1856	2,985,735	183,946	...	...	...	...
1857	2,761,567	161,043	...	...	...	10,437
1858	2,528,227	280,558	...	...	...	13,534
1859	2,280,717	323,984	...	...	...	7,336
1860	2,156,700	381,614	4,127	...	...	4,538
1861	1,967,453	459,879	1,077	...	...	194,031
1862	1,658,281	616,910	190	...	...	410,862
1863	1,627,105	467,399	3,937	...	...	628,450
1864	1,545,437	341,954	22,037	...	...	480,171
1865	1,543,188	364,541	25,339	...	...	574,574
1866	1,478,280	287,534	22,916	...	348	735,376
1867	1,433,246	269,407	49,092	...	1,363	686,905
1868	1,634,200	258,774	165,801	...	692	637,474
1869	1,337,296	252,130	138,221	...	137	614,281
1870	1,222,798	240,402	136,773	...	964	544,880
1871	1,355,477	321,469	171,937	...	6,005	730,029
1872	1,282,521	424,100	186,019	2,494	6,969	445,370
1873	1,241,205	360,850	194,895	98	4,661	505,337

Gold Produce in Australasian Colonies, 1851 to 1890 —*continued.*

Year.	Victoria.	New South Wales.	Queensland.	South Australia.	Tasmania.	New Zealand.
	oz.	oz.	oz.	oz.	oz.	oz.
1874	1,155,972	270,710	375,586	8,351	4,651	376,388
1875	1,095,787	229,386	391,515	13,742	3,010	355,322
1876	963,760	155,166	374,776	9,857	11,107	322,016
1877	809,653	122,629	428,104	11,811	5,777	371,685
1878	775,272	117,978	310,247	10,746	25,249	310,486
1879	758,947	107,640	288,556	14,250	60,155	287,464
1880	829,121	116,751	267,136	13,246	52,595	305,248
1881	858,850	145,532	270,945	16,976	56,693	270,561
1882	898,536	129,233	224,893	15,669	49,122	251,204
1883	810,047	122,257	212,783	15,939	46,577	248,374
1884	778,618	105,933	307,804	21,455	42,340	229,946
1885	735,218	100,667	310,941	18,327	41,241	237,371
1886	665,196	98,446	340,998	26,315	31,014	227,079
1887	617,751	108,101	425,923	36,569	42,609	203,869
1888	625,026	85,296	481,643	16,763	39,610	201,219
1889	614,839	118,948	739,103	20,833	32,333	203,211
1890	588,561	127,289	610,587	29,738	23,451	193,193
Total	56,839,359	10,177,439	7,483,901*	303,179	588,673	11,818,221

Gold produce of Australasia, 1851 to 1890.

603. According to the above figures the total quantity of gold raised in each colony from 1851 to 1890 has been as follows :—

Summary of Gold Produce of Australasia, 1851 to 1890.

	Oz.		Oz.
Victoria	56,839,359	South Australia	303,179
New Zealand... ...	11,818,221	Western Australia ...	158,298†
New South Wales ...	10,177,439		
Queensland	7,483,901	Total	87,369,070
Tasmania	588,673		

Value of gold raised in Australasia.

604. The average value of the gold raised varies in the different colonies. If it be estimated at £4 per ounce, the total value would be £349,476,280, or if at £3 15s. per ounce, it would by £327,634,012‡.

Gold produce of the world, 1886 to 1889.

605. By the following table—which, with the exception of the figures for Australasia, has been taken from the report for 1890 of Mr. Edward O. Leech, director of the United States Mint—it appears that during the four years ended with 1889 the world's annual production of gold has averaged rather more than $5\frac{1}{3}$ million ounces, and appears to be increasing by about 370,000 ounces per

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* The estimate for Queensland is higher by 45,426 ounces than that furnished by the Registrar-General of Queensland and published in the "Australasian Statistics, 1890," for which see Table XIX. in Appendix A., at end of this volume.

† For Western Australia, the yield prior to 1889 has been estimated roughly at 100,000 oz., and to this has been added the quantities which have since appeared in the export returns. This, however, is admittedly considerably below the actual production.

‡ Pure gold is worth £4 4s. $11\frac{1}{2}$d., and standard gold (22 carats fine) £3 17s. $10\frac{1}{2}$d.

annum; the largest quantity produced in 1889 being in Australasia, the next largest in the United States, and the next in Russia:—

GOLD PRODUCE OF EACH COUNTRY, 1886 TO 1889.*

Countries.	1886.	1887.	1888.	1889.
	oz.	oz.	oz.	oz.
Australasia	1,389,048	1,434,822	1,499,556	1,745,570
Europe—				
Great Britain ...	...	64	7,071	3,118
Russia	992,288	971,717	1,030,215	1,120,695
Sweden	2,154	2,700	2,443	2,379
Germany	34,231	72,352	57,599	62,934
Austria-Hungary ...	53,484	60,331	60,331	70,648
Turkey	321	321	321	321
Italy	6,268	6,268	4,757	4,757
Asia—				
British India ...	20,378	15,460	33,171	73,059
China	176,524	459,437	435,267	435,267
Japan	10,703	18,128	19,478	19,478
Africa	69,523	92,826	217,633	390,686
America—				
Canada	64,895	56,988	53,774	61,681
United States ...	1,692,694	1,595,979	1,604,432	1,586,304
Mexico	29,699	39,856	47,088	43,777
Salvador & Costa Rica	4,211	7,264	7,264	7,264
Colombia	120,918	145,088	145,088	145,088
Venezuela	161,353	95,140	68,463	68,463
Guiana (British) ...	...	11,893	14,464	22,082
Guiana (Dutch) ...	...	22,885	15,653	15,653
Brazil	48,277	31,628	21,535	21,535
Peru	5,464	5,078	5,078	5,078
Bolivia	3,504	4,596	2,893	2,893
Chile	16,071	76,466	94,915	94,915
Argentiue Republic ...	964	1,446	1,511	1,511
The World ...	4,902,972	5,228,733	5,450,000	6,005,156

Value of the world's gold produce, 1886-1889.

606. According to the figures, the gold raised in the world during 1889, if valued at £4 per ounce, would be £24,020,624; or if at £3 15s. per ounce, it would be £22,519,335. During the four years the value of the whole quantity raised (21,586,861 oz.) would be £86,347,444 at the former, or £80,950,729 at the latter valuation.

Gold derived from alluvial and quartz workings.

607. Of the gold which was raised during 1890 in Victoria, 382,401 oz. was obtained from quartz reefs, and 206,160 oz. from alluvial deposits. These figures, as compared with those of the previous year, show a decrease of 2,583 oz. in the yield of quartz reefs, and one of 23,695 oz. in that of alluvial workings. The respective proportions

* See U.S. Mint Report, 1890, pages 188 and 189, where the quantities are given in kilogrammes, which have been converted into ounces on the assumption that a kilogramme is equal to 32·142 oz. troy. When the figures for any year were not given by Mr. Leech, those for a previous year have been inserted. For 1890, the world's production of gold was estimated by the same authority at 5,610,579 ozs.

of quartz and alluvial gold raised were 63 and 37 per cent. in 1889, and 65 and 35 per cent. in 1890.

Value of gold per miner.

608. The value of gold raised in Victoria in proportion to the number of miners at work* fell to its lowest point in 1879, when it only amounted to £76 1s. 2d. per head; and reached its highest point in 1885, when it was £108 15s. 9d. per head. In 1890 it was £98 15s. 7d., or £2 6s. 8d. lower than in 1889, but higher than in any years since 1870, except 1874, 1875, 1884, 1885, and 1886. The following figures, which have been derived from returns supplied by the Secretary for Mines, express this proportion for the last twenty years :—

VALUE OF GOLD PER MINER,† 1871 TO 1890.

	£	s.	d.		£	s.	d.
1871	93	6	1½	1881	95	11	9½
1872	93	17	1½	1882	95	19	7¾
1873	93	16	2½	1883	95	6	3½
1874	99	8	3	1884	106	14	6¼
1875	104	4	4	1885	108	15	9¼
1876	89	19	6¾	1886	104	18	4
1877	82	6	1¾	1887	96	17	2
1878	82	12	11½	1888	97	8	7
1879	76	1	2¼	1889	101	2	3
1880	81	18	11¾	1890	98	15	7

alue of gold per alluvial and quartz miner.

609. In proportion to the number of miners engaged in alluvial and quartz mining, the yield of gold from the latter has frequently been more than twice as large as that from the former. The following are the figures for the last thirteen years :—

VALUE OF GOLD PER ALLUVIAL AND QUARTZ MINER, 1878 TO 1890.

Year.	Alluvial Miners.			Quartz Miners.		
	£	s.	d.	£	s.	d.
1878	47	3	6¾	138	7	7¼
1879	48	10	1½	118	8	7
1880	49	14	2	129	11	7¾
1881	62	0	9¾	141	19	2½
1882	68	14	1½	131	19	5½
1883	66	4	4	132	13	2
1884	76	4	2	144	9	10
1885	75	17	2	148	19	11
1886	72	11	2½	144	13	11½
1887	68	5	4	125	12	0
1888	76	17	7	121	8	11
1889	78	13	11	124	11	7
1890	74	10	10	120	18	6

* For the number of gold miners at work in 1890, see paragraph 343, Volume I.

† These amounts are sometimes incorrectly spoken of as the "average earnings" of the miners. It has been pointed out on former occasions that, as a very large proportion of the miners are working on wages, the gold they raise no more represents their individual earnings than do the products of a manufactory represent the earnings of its operatives. For wages of miners, see Part "Interchange" *ante*.

610. The estimated yield of gold in the first nine months of 1891 was 428,210 oz. as against 435,743 oz. in the first nine months of 1890.* One-third added to the first quoted amount would give 570,947 oz. as the estimate for the whole of 1891, or 17,614 oz. less than the quantity actually raised in 1890, and 43,892 oz. less than the quantity raised in 1889. Estimated gold yield, 1891.

611. Exclusive of the amounts paid by a few private companies, respecting which the Mining Department was unable to obtain information, the following are the dividends paid by gold mining companies in Victoria, in the last two quarters of 1890 and the first two quarters of 1891 :— Dividends of gold mining companies.

DIVIDENDS OF GOLD MINING COMPANIES, 1890–91.

Quarter ended September, 1890	... ...	£126,532
,, December, 1890	... ...	139,416
,, March, 1891	... ...	102,843
,, June, 1891	... ...	127,328
Total in 12 months	... ...	£496,119

612. Of the steam engines employed in connexion with gold mining, about a sixth are used on alluvial and five-sixths on quartz workings. The following is the number of engines in use and their horse-power in each of the last seventeen years :— Steam engines used in mining.

STEAM ENGINES USED IN GOLD MINING, 1874 TO 1890.

Year.	Number.	Horse-Power.	Year.	Number.	Horse-Power.
1874	1,141	24,866	1883	1,087	25,933
1875	1,101	24,224	1884	1,104	26,228
1876	1,081	23,947	1885	1,085	26,627
1877	1,067	23,416	1886	1,072	26,920
1878	1,036	22,711	1887	1,080	27,218
1879	1,024	22,509	1888	1,119	27,472
1880	1,030	22,499	1889	1,123	26,680
1881	1,034	23,379	1890	1,104	27,153
1882	1,074	24,692			

613. The value of gold-mining machines of all descriptions, as estimated by the Department of Mines, increased from £1,845,862 in 1889 to £1,849,112 in 1890. In the latter year, the value of those used in quartz mining was £1,587,937, whilst that of those used in alluvial mining was only £261,175. Mining machinery.

* See Mining Registrars' Reports for first three quarters of 1890 and 1891. Whilst these pages were being printed, the gold yield of the year 1891 was estimated at 577,630 ounces, or 10,931 ounces less than in 1890.

Average yield of quartz.

614. It is impossible to obtain an exact statement of the yield of auriferous quartz in any year, owing to the fact that many of the owners of machines for crushing quartz are unable to give, or are precluded from giving, information respecting their operations. The officers of the Mining Department, however, succeeded in obtaining particulars respecting the crushing of 732,461 tons in 1889, and 752,399 tons in 1890. The average yield per ton of these crushings was 9 dwt. 19 gr. in the former, and 9 dwt. 4 gr. in the latter year. From similar estimates, extending over a long series of years, and embodying information respecting the crushing of nearly 25,606,000 tons of quartz, an average is obtained of 10 dwt. 9 gr. of gold to the ton of quartz crushed.

Gold from various matrices.

615. The following is the estimate of the Mining Department* of the gross and average yield of over 44½ millions of tons of the various minerals and drifts from which gold is obtained in Victoria. The quantity of gold included in the estimate is about a fourth of the total yield of the Victorian gold-fields from the period of the first gold discoveries to the end of 1890 :—

GOLD FROM VARIOUS MATRICES.

Matrix.	Quantity Treated.	Yield of Gold.	
		Total.	Average per ton.
From Quartz Reefs.	tons.	oz.	oz. dwt. gr.
Quartz	25,606,109	13,297,044	0 10 9
Tailings and mullock ...	2,304,679	351,608	0 3 1
Pyrites	135,085	294,891	2 3 15
From Alluvial Workings.			
Washdirt	16,210,212	1,219,864	0 1 12
Cement	429,761	98,616	0 4 14
Total	44,685,846	15,262,023	0 6 20

Deep shafts.

616. The ten deepest shafts in the colony are those of Lansell's 180 mine, 2,640 feet; Magdala Company, 2,409 feet; North Old Chum, 2,310 feet; New Chum and Victoria, 2,309 feet; Victoria Reef Quartz, 2,302 feet; Victory and Pandora, 2,300 feet; Old Chum, 2,208 feet; Victoria Consols, 2,162 feet; Lazarus Company, 2,150 feet; Ironbark Company, 2,140 feet. It thus appears that the greatest depth to which the earth's crust has been pierced in this

* *Mineral Statistics* 1890, Statement No. 6.

colony by a shaft is a little over 2,600 feet.* The second mine mentioned is at Stawell, all the others are at Bendigo.

Gold-mining leases.

617. Since the first issue of gold-mining leases, the total number granted has been 17,132, giving the right to mine over an area amounting in the aggregate to 332,145 acres. Of these leases, 429, for 10,977 acres, were granted in 1890; and 1,458, for 35,402 acres, were in force at the end of that year.

Silver raised in Australasian colonies.

618. Some years ago a silver mine was worked at St. Arnaud, in Victoria, but after a time it ceased to be remunerative, and the workings were abandoned. Since the establishment of a branch of the Royal Mint in Melbourne, a certain quantity of silver has been extracted annually from the crude gold lodged there for coining, and latterly the whole quantity of silver produced in Victoria has been from that source. It is difficult to obtain reliable information respecting silver produce, as in consequence of the silver being generally associated with lead and other metals, it is found economical to send the ore in a concentrated form to Europe for smelting. For Queensland and South Australia† no definite returns are available; and but little silver has been raised in Western Australia. The following, so far as is known, are the quantities raised in Victoria, New South Wales, Tasmania, and New Zealand during the twenty-eight years ended with 1890:—

SILVER PRODUCE IN AUSTRALASIAN COLONIES, 1863 TO 1890.

Year.	Victoria.‡	New South Wales.	Tasmania.	New Zealand.‡
	oz.	oz.	oz.	oz.
1863	1,098	...	...	...
1864	5,688	...	...	...
1865	3,379	...	...	...
1866	2,348	...	...	...
1867	78	...	...	...
1868	5,761	...	...	...
1869	...	753	...	11,063
1870	...	13,868	...	37,123
1871 ...	...	71,311	...	80,272
1872	8,011	49,544	...	37,064
1873	14,347	66,997	...	36,187

* See Report of Mining Registrars for the quarter ended 30th June, 1891, page 61.

† It is known that in Queensland 1,913 tons of silver-lead ore, valued at £56,639, were raised in 1890; 1,104 tons, valued at £61,500, in 1889; 1,190 tons, valued at £44,015, in 1888: 2,183 tons, valued at £80,092, in 1887; 1,631 tons, valued at £52,797, in 1886; 2,377 tons, valued at £49,922, in 1885; and 15,519 tons, valued at £224,669, in the previous six years; also that in South Australia 1,620 tons of silver-lead ore, valued at £23,349, were raised in the ten years ended with 1884.

‡ In Victoria and New Zealand, nearly all the silver produced has been extracted from crude gold.

Silver Produce in Australasian Colonies, 1863 to 1890 —*continued.*

Year.	Victoria.*	New South Wales.	Tasmania.	New Zealand.*
	oz.	oz.	oz.	oz.
1874	11,906	78,027	...	40,566
1875	21,842	52,553	...	29,085
1876	26,355	69,179	...	12,683
1877	19,717	31,409	...	33,893
1878	22,995	60,563	...	23,018
1879	23,728	83,164	...	20,645
1880	23,247	91,419	...	20,005
1881	20,957	57,254	...	18,885
1882	20,343	38,618	...	5,694
1883	22,121	77,065	...	16,826
1884	27,070	93,660	...	24,914
1885	28,951	794,174	...	16,624
1886	26,422	1,015,433	...	12,108
1887	26,321	3,137,800†	...	20,809
1888	28,971	6,427,000†	25,000	403
1889	28,630	9,067,500†	30,000	24,105
1890	25,966	11,105,500†	113,500	32,637
Total ...	446,252	32,482,791	168,500	554,609

Value of silver raised in Australasia.

619. The total quantity of silver raised in the four colonies, according to the table, was 33,652,152 oz., which would represent a value at 4s. per ounce of £6,730,430; or, at 3s. 6d. per ounce, of £5,889,127.

Broken Hill silver mines.

620. The bulk of the silver raised in Australasia is from the Broken Hill mines, situated in New South Wales, at or near the Barrier Ranges, close to the eastern frontier of South Australia. The principal mine is that of the Broken Hill Proprietary Company, which has a capital of £384,000 in 960,000 shares of 8s. each, fully paid up.‡ From the time of the formation of this company on the 13th August, 1885, to the 31st May, 1891, the ore treated amounted to 656,024 tons, the total yield of which was 107,038 tons of bullion (chiefly lead) containing 25,728,591 ounces of silver, of which 8,790,670 ounces of silver and 38,563 tons of lead were produced in the year 1890-91. The dividends and bonuses paid, together with profits resulting from sales of outlying portions of the company's

* See footnote (‡) on previous page.

† No official statement having been published in New South Wales of the quantity of silver raised in that colony in the last four years, these quantities have been estimated in the office of the Government Statist, Melbourne, from information supplied by the manager of the Broken Hill Proprietary mine, and that obtained from other sources.

‡ Prior to the 12th February, 1890, the share capital was £320,000, divided into 160,000 shares of £2 each. Of the present shares 160,000 are registered in London.

property, allotted to shareholders since the commencement, have amounted to a total value of £5,064,000. For the six months ended with May, 1891, the mine has paid dividends to the amount of £576,000. The number of men permanently employed at and in connexion with the mine on 31st May, 1891, was 2,545.

621. The next table, with the exception of the figures for Australasia, has also been taken from Mr. Leech's Mint Report for 1890, and shows that the world's production of silver during the four years ended with 1889 averaged 109⅓ million oz. per annum, and has been increasing at the rate of about 10½ million ounces per annum; the largest quantities raised in 1889 being in the United States and Mexico, and the next largest in Australasia, Bolivia, and Chile:— Silver produce of each country.

SILVER PRODUCE* OF EACH COUNTRY, 1886 TO 1889.

Countries.	1886.	1887.	1888.	1889.
	oz.	oz.	oz.	oz.
Australasia	1,053,963	3,184,930	6,481,374	9,150,235
Europe—				
Russia	408,428	434,624	466,798	462,491
Sweden	99,030	187,324	149,396	137,150
Norway	231,422	165,435	165,435	165,435
Germany	856,584	1,014,530	1,030,183	1,029,830
Austria-Hungary ...	1,617,064	1,716,094	1,716,094	1,692,309
Turkey	42,524	42,524	42,524	42,524
Italy	940,443	1,087,653	1,125	1,125
France	1,639,242	1,745,761	1,587,686	1,587,686
Spain	1,746,436	1,887,089	1,655,377	1,655,377
Great Britain ...	325,406	320,263	290,789	280,728
Asia—				
Japan	798,889	1,030,633	1,363,592	1,363,592
Africa	101,729	13,885	...	...
America—				
Canada	161,674	349,319	297,763	297,763
United States ...	39,442,766	41,265,667	45,780,686	49,996,431
Mexico	25,521,809	29,056,368	31,997,361	42,936,184
Central America ...	...	1,546,770	1,546,770	1,546,770
Colombia	309,367	773,369	773,369	773,369
Brazil	4,532	...	...	...
Peru	3,093,539	2,419,103	2,419,103	2,419,103
Bolivia	12,374,188	4,418,496	7,407,445	7,407,445
Chile	6,749,820	6,412,843	5,973,623	5,973,623
Argentine Republic ...	46,413	23,207	328,684	328,684
The World† ...	97,565,268	99,095,887	111,475,177	129,247,854

* See U.S. Mint Report, 1890, pages 188 and 189, where the quantities are given in kilogrammes, which have been converted into ounces on the assumption that a kilogramme is equal to 32·142 oz. troy. For 1890, the world's production of silver was estimated by the same authority at 128,906,005 ozs.

† British India, which, according to another authority, produced silver to the value of £914,367 in 1883, does not appear to be included.

Value of the world's silver produce 1886-1889.

622. At 4s. per ounce the quantity of silver raised in the world during 1889 would be worth £25,849,571; or, at 3s. 6d. per ounce, it would be worth £22,618,375. The quantity raised in the four years ended with 1889 would be worth £87,476,837 at the former, or £76,542,233 at the latter valuation.*

Relative values of gold and silver.

623. The relative values of silver and gold have always been variable. Until comparatively recent years, however, the fluctuations have been but slight. In the 102 years, 1687 to 1789, the ratio of the former to the latter was as high as 15·39 to 1, viz., in 1734; and as low as 14·14 to 1, viz., in 1760. After 1789 the ratio was never below 15 to 1, but until 1874 only twice rose above 16 to 1, viz., in 1812, when it rose to 16·11 to 1, and in 1813, when it rose to 16·25 to 1. Since 1873, the depreciation of silver and consequent difference in value between the two metals had been growing each year up to 1889, when it took 22·1 parts of silver to be equivalent to 1 part of gold—the greatest difference yet reached; but in 1890 the proportion fell suddenly to 19·2, owing, it is believed, to the increased but artificial demand caused by large purchases of bullion by the United States Treasury. The following figures show the relative values of the two metals in each of the 20 years, 1871 to 1890:—

Relative Values of Gold and Silver, 1871 to 1890.†

In 1871	1 part	of gold was worth	15·57	parts of silver.
„ 1872	„	„	15·63	„
„ 1873	„	„	15·92	„
„ 1874	„	„	16·17	„
„ 1875	„	„	16·59	„
„ 1876	„	„	17·88	„
„ 1877	„	„	17·22	„
„ 1878	„	„	17·94	„
„ 1879	„	„	18·40	„
„ 1880	„	„	18·05	„
„ 1881	„	„	18·16	„
„ 1882	„	„	18·19	„
„ 1883	„	„	18·64	„
„ 1884	„	„	18·57	„
„ 1885	„	„	19·41	„
„ 1886	„	„	20·78	„
„ 1887	„	„	21·13	„
„ 1888	„	„	21·99	„
„ 1889	„	„	22·09	„
„ 1890	„	„	19·18	„

* In 1890, according to the 21st Annual Report of the Deputy-Master of the Royal Mint, London, page 18, the average price per ounce paid for silver bullion for coinage (standard silver) was rather less than 4s. 0¾d., or 6d. higher than the average price for 1889. The silver in the table, taken as a whole, was probably considerably below the standard.

† The relative values for the years prior to 1890 have been taken from the U.S. Mint Report, 1890, page 184.

624. Silver, tin, copper, antimony, lead, iron, and coal have been mined for at different times in Victoria, but with the exception of black and brown coal, and small quantities of tin and antimony, no minerals of importance were raised in 1890. The silver obtained in that year was, as has already been stated, extracted at the Mint during the process of refining the gold. Large deposits of tin have recently been discovered at Mount Wills, where over 200 men were employed during the latter part of 1891, and great expectations are entertained respecting the future of the mines in that locality. The following metals also exist in Victoria, but up to this date have not been discovered in paying quantities:—Bismuth, cobalt, cadmium, manganese, molybdenite, osmiridum, and zinc-blende. Various limestones and marbles, as well as kaolin and other clays, also exist, and have been worked to a certain extent.

Minerals other than gold existing in Victoria.

625. Many attempts have been made to mine for coal, but the seams hitherto worked have been too thin to yield a profit;* the reported discovery of thicker seams, however, and of large deposits of brown coal, chiefly in South Gippsland, led to the appointment, in July, 1889, of a Royal Commission, which was instructed "to inquire into and report as to the best means of developing the coal mining industry of Victoria." This commission has brought up a progress report,† in which several seams of true coal situated in different localities are referred to, varying in thickness from 2 feet to 4 feet 6 inches; and in the Annual Report of the Secretary for Mines for 1890 it is stated that, by means of 5 diamond drills which were employed during the year, a seam of 3 feet 2 inches was discovered at Boolarra, and six seams at Korumburra varying from 2 feet 6 inches to 4 feet 11 inches in thickness of good coal; and early in 1891 the continuance of the Jumbunna seam of nearly 5 feet in thickness, and the discovery of a seam said to be over that thickness at Korumburra, were reported, and coal mining at the two places named was being actively carried on.

Coal.

626. The deposits of brown coal or lignite in Victoria are practically unlimited, and are thought to represent the largest supply of fossil fuel known in the world. The Coal Commissioners, in their first progress report‡, mentioned one mine in which the thickness of

Brown coal.

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* So far as is known, only 57,962 tons of coal have been raised, chiefly from Crown lands, in Victoria up to the present time. Of this, 26,805 tons were obtained during the last six years by the Moe Coal Mining Company on private lands.

† See last edition of this work, Vol. II., paragraphs 622 and 624.

‡ Parliamentary Paper No. 168, Session 1890

the deposits ranged from 60 to 200 feet. They say that "the brown coal differs materially from the black both in appearance and character. It belongs to the tertiary formation, and represents only a partial degree of mineralization. It is comparatively light, burns freely when dry, gives off a strong heat without smoke, and leaves a very small percentage of ash. Its principal drawback arises from the quantity of moisture it contains, and the fact that the gas extracted from it is of low luminosity." A second progress report,* dated 9th December, 1890, gives the results of a series of practical experiments with a view of ascertaining the value of brown coal for manufacturing, domestic, and other economic purposes. In regard to its illuminating power, as compared with good gas coal, a ton of which should yield from 10,000 to 11,000 cubic feet of gas of from 15 to 17 candle power, and a residue of 12 cwt. of good marketable coke, it was found that, although from 6,447 to 15,083 cubic feet of gas was obtained per ton from the brown coal, the highest degree of luminosity was only 9·3 candle power, and in some cases it was *nil.* For steaming purposes it required from 2·16 to 2·42 tons to do as much work as 1 ton of small Newcastle coal, whilst it required more stoking; and its comparative value for heating purposes was estimated at 8s. $4\frac{3}{4}$d. per ton, as compared with 15s. $7\frac{1}{2}$d. for Newcastle slack. These experiments were made on the crude coal as it was taken from the mine, and it sometimes contained from 36 to 56 per cent. of water, the average being about 40 per cent. In the form of briquettes, however, there was evidence leading to the belief that it would be well adapted for domestic use; and with a view of placing the brown coal industry on a sound and permanent footing, the Commissioners recommended "that a qualified gentleman should be despatched at once to Europe for the purpose of acquainting himself with, and reporting upon, the methods adopted in Germany and other countries in Europe for raising and sending the coal to market, manufacturing the raw material into briquettes, and the application of the fuel to the industrial arts, to locomotive, domestic, and economic purposes." In accordance with this recommendation, Mr. J. Cosmo Newbery, C.M.G., was despatched to Europe by the Government, with instructions to inquire into and report upon the whole subject.

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* Parliamentary Paper No. 213, Session 1890.

627. At the present time, the coal-producing colonies of Australasia are, practically, New South Wales, New Zealand, and Queensland, whilst small quantities have been found in Tasmania and Victoria. In these over 4 million tons of coal were raised in 1890, but three-fourths of this quantity came from New South Wales. The following are the quantities returned as brought to the surface in each of those colonies during a series of years :— Coal raised in Australasian colonies.

COAL RAISED IN AUSTRALASIAN COLONIES, 1876 TO 1890.

Year.	Tons of Coal raised in—				
	New South Wales.	Queensland.	Tasmania.	New Zealand.	Victoria.
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	162,218	Nil.
1879	1,583,381	55,012	9,514	231,218	Nil.
1880	1,466,180	58,052	12,219	299,923	3
1881	1,769,597	65,612	11,163	337,262	Nil.
1882	2,109,282	74,436	8,803	378,272	10
1883	2,521,457	104,269	8,872	421,764	428
1884	2,749,109	129,980	7,194	480,831	3,280
1885	2,878,863	209,698	5,334	511,063	800
1886	2,830,175	228,656	10,391	534,353	86
1887	2,922,497	238,813	27,763	558,620	3,357
1888	3,203,444	311,412	41,577	613,895	8,573
1889	3,655,632	265,507	40,300	586,445	14,596
1890	3,060,876	338,344	53,812	637,397	14,601

628. The following is a statement of the quantity of coal raised in various countries during one year, the returns being generally those for 1884, 1885, or 1886 :— Coal raised in various countries.

ANNUAL PRODUCTION OF COAL IN VARIOUS COUNTIES.*

	Tons.		Tons.
United Kingdom ...	157,518,482	Canada	2,091,976
United States (1887) ...	124,015,255	Spain	1,000,000
Germany	58,020,612	Japan	900,000
France	20,014,597	Sweden	250,600
Belgium	17,253,144	Italy	220,000
Austria-Hungary ...	17,191,500	Chile	50,000
Russia	4,500,000	Other Countries (estimated)	8,000,000
Australasia (1890) ...	4,105,030		
British-India ...	4,000,000	Total	423,131,196
China	4,000,000		

* The figures in this table, except those for Australasia and Canada, have been derived from the *American Almanac and Treasury of Facts*, 1888, p. 40, by Ainsworth R. Spofford, Librarian of Congress.

Leases for other minerals.

629. During 1890, 41 leases—of which 17 were for tin and 17 for coal mining—of Crown lands were issued, conferring the privilege of working for minerals and metals other than gold; whilst at the end of the year the number and area of leases in force in Victoria were as follow:—

LEASES FOR MINERALS AND METALS OTHER THAN GOLD, 1890.

Metals and Minerals.	Leases in force at end of 1890.			
	Number.	Area.		
		a.	r.	p.
Antimony and the Ores of Antimony ...	3	281	0	1
Carbonate of Lime	1	594	0	36
Calcite and Silicate of Alumina	2	64	1	21
Coal	31	14,740	1	7
Copper and the Ores of Copper	6	892	1	16
Infusorial Earth and Kaolin	1	9	1	26
Iron and the Ores of Iron	2	779	0	0
Lead and the Ores of Lead	3	449	0	9
Lead and Silver	2	481	2	27
Lignite, or Brown Coal	2	434	2	10
Silver and the Ores of Silver	3	220	0	13
Silver, Lead, and Copper	4	539	3	12
Slate and Slate Flagging	10	546	1	30
Tin and the Ores of Tin	87	5,974	3	13
Turquoise	2	82	0	12
Total	159	26,089	0	33

Leases for other minerals, 1889 and 1890.

630. The leases in force at the end of 1890, as shown in the table, were greater by 20, and the area comprised therein was greater by 7,098 acres, than at the end of 1889. The leases for tin mining increased from 70 to 87, and those for coal mining from 19 to 31, while those for silver and lead mining fell from 11 to 7. It should also be mentioned that, besides leases, several licences were issued during the year to search for metals and minerals other than gold.

Minerals other than gold raised.

631. According to the estimate of the Mining Department, the following are the values of metals and minerals other than gold raised in Victoria from 1851 to the end of 1890:—

Value of Minerals and Metals other than Gold, 1851 to 1890.

Name.	Estimated Value.		
	1851 to 1889.	Year 1890.	Total.
	£	£	£
Silver*	83,729	5,193	88,922
Tin	670,183	3,836	674,019
Copper and copper ore	191,107	100	191,207
Antimony	169,452	3,120	172,572
Calcite	...	300	300
Lead	5,360	50	5,410
Iron	12,540	...	12,540
Coal†	39,756	13,899	53,655
Lignite...	2,333	2,500	4,833
Kaolin	7,444	...	7,444
Flagging	72,228	1,212	82,369
Slates	8,929		
Gypsum	7	...	7
Magnesite	12	...	12
Ores, mineral earthy clays, etc. ...	10,901	...	10,901
Diamonds	108	...	108
Sapphires, etc.	630	...	630
Total	1,274,719	30,210	1,304,929

632. The following, according to the estimate of the Mining Department, is the number of men engaged in searching for various kinds of minerals or metals other than gold ‡ at the end of 1890. The figures show an increase of 157 in the tin, and of 67 in the antimony miners; but a falling-off of 49 in the coal, 38 in the slate and flag, and 20 in the silver and lead miners, the net increase being 103 as compared with 1889:— Miners for minerals other than gold.

Miners for Minerals other than Gold, 1890.

	Number of Miners.		Number of Miners.
Antimony	79	Silver and lead	16
Coal	205	Slate and flag	36
Infusorial earth	5	Tin	238
Kaolin	6		597
Turquoise	6		
Lignite	6		

633. Quicksilver, which is largely used in the recovery of gold, especially from crushed quartz, has not yet been found in Australia in payable quantities. In 1880 and 1881 rather more was produced Quicksilver —produce of the world.

* Of late years the silver produced has been extracted from gold in the process of refinement at the Melbourne branch of the Royal Mint.

† The quantity of coal raised was 57,962 tons, inclusive of 26,805 tons raised by the Moe Coal Mining Company on private lands from 1885 to 1890.

‡ For number of gold miners see paragraph 343, Volume I.

in the United States than in all the rest of the world, but since 1881 there has been a gradual falling off in the quantity raised there, whilst in 1889 the other quicksilver producing countries—viz., Spain, Austria, and Italy—in which the production of quicksilver has been steadily increasing, produced nearly three times as much as the United States. The following figures, which show the world's production of quicksilver in each of the ten years ended with 1889, were prepared for the coming report of the census of the United States by Dr. David T. Day, of the United States Geological Survey :—

WORLD'S PRODUCTION OF QUICKSILVER, 1880 TO 1889.

Year.	United States.	Spain, Austria, and Italy.	Total.
	Flasks.	Flasks.	Flasks.
1880	59,926	59,242	119,168
1881	60,851	60,082	120,933
1882	52,732	62,489	115,221
1883	46,725	68,394	115,119
1884	31,913	69,915	101,828
1885	32,073	66,281	98,354
1886	29,981	73,070	103,051
1887	33,760	75,027	108,787
1888	33,250	76,664	109,914
1889	26,464	74,772	101,236
Totals ...	407,675	685,936	1,093,611

Revenue from goldfields.

634. The revenue derived from the goldfields amounted to £18,408 in 1888-9, and £18,204 in 1889-90. The amount in the latter year was made up of the following items :—

REVENUE FROM GOLDFIELDS, 1889-90.

Miners' rights	£5,705
Business licences	230
Rents for leases of auriferous and mineral lands ...	9,727
,, mining on private property	1,403
Water-right and searching licences	1,139
Total	£18,204

State aid to mining.

635. The State aid to the mining industry during the year 1889-90 was £137,291, as compared with £119,139 in 1888-9.* The former sum is made up of £27,154, cost of the Mining Department and Mining Boards ; £88,080 to assist miners in prospecting operations, and to defray the cost and working expenses of diamond drills ;

* See page 97 of the first volume of this work.

£10,937 for prospecting and boring for coal; and £11,120 for geological and underground surveys, cutting tracks in unexplored regions, etc. Under the second of these items, usually known as the "Prospecting Vote," the expenditure was only £20,000 a few years since; but it has latterly amounted to £80,000 or more.

Loans to mining companies.

636. During the period from 1875-6 to 1879-80, the sum of £21,050 was lent to mining companies, but only £1,237 has since been repaid. Of the balance (£19,813) as much as £15,813 has been written off as non-recoverable.

Diamond drills.

637. In 1890, inclusive of the cost of wear and tear of diamonds, £21,716 was spent on the working of diamond drills, of which £16,766 was expended in gold prospecting, and £4,950 in coal prospecting. The average cost of boring with diamond drills was 12s. 6d. per foot, and with other machines on contract, 7s. 11½d. per foot.

Operations of diamond drills.

638. Of the sixteen diamond drills belonging to the Mining Department, ten were engaged in alluvial prospecting, five in coal prospecting, and one used by the Water Supply Department, in boring for water, at the end of June, 1891. The number of bores made in 1890 was 145, viz., 132 in search of gold, and 13 in search of coal; the aggregate depth bored was 30,160 feet for gold, and 7,978 for coal.

Mining on private property.

639. An Act to legalise mining for gold and silver on private property, and to compensate the owner and occupier thereof for the damage sustained by reason of the land being taken, or of their being deprived of possession of the surface thereof, in consequence of mining operations, came into force on the 24th November, 1884. This Act has since been subjected to certain amendments, which are embodied in the present Consolidated Act, 54 Vict. No. 1120. Between that date and the 31st December, 1889, 771 leases were issued under it, covering an area of 146,071 acres, and during the year 1890, 82 leases were issued covering an area of 7,482 acres.

Value of mining produce.

640. The estimated value of the produce raised from Victorian mines and quarries in 1890 is summarized as follows:—

VALUE OF MINING PRODUCE, 1890.

	£
Gold	2,354,244
Other metals and minerals	30,210
Stone from quarries	297,990
Total	2,682,444

Agricultural, pastoral, and mining produce.

641. The estimated value of the agricultural, pastoral, and mining produce raised in Victoria, during each of the last seventeen years, is given in the following table. It should be borne in mind that the prices of agricultural and pastoral produce, on which the value mainly depends, fluctuates from year to year.* In several of the years the value of the pastoral produce was greater than that of the other two industries combined:—

VALUE OF AGRICULTURAL, PASTORAL, AND MINING PRODUCE, 1874 TO 1890.

Year.	Estimated Value of—			Total.
	Agricultural Produce.	Pastoral Produce.†	Mining Produce.‡	
	£	£	£	£
1874 ...	4,410,436	9,840,562	4,740,679	18,991,677
1875 ...	4,835,894	9,541,551	4,475,876	18,853,321
1876 ...	5,574,239	10,069,570	3,949,135	19,592,944
1877 ...	5,792,898	8,652,471	3,322,264	17,767,633
1878 ...	4,912,745	8,360,265	3,211,990	16,485,000
1879 ...	5,875,313	6,375,965	3,136,527	15,387,805
1880 ...	5,395,021	9,855,800	3,397,661	18,648,482
1881 ...	5,893,874	8,684,218	3,533,658	18,111,750
1882 ...	6,439,972	9,297,812	3,681,245	19,419,029
1883 ...	7,372,143	10,203,914	3,357,252	20,933,309
1884 ...	6,565,527	9,887,229	3,228,738	19,681,494
1885 ...	7,118,388	9,049,679	3,091,244	19,259,311
1886 ...	7,260,735	8,911,336	2,839,120	19,011,191
1887 ...	7,078,653	8,651,599	2,661,625	18,391,877
1888 ...	6,601,601	9,016,573	2,711,024	18,329,198
1889 ...	7 845,739	9,063,910	2,687,098	19,596,747
1890 ...	7,800,139	10,105,498	2,682,444	20,588,081

Agricultural, pastoral, mining, and manufacturing produce.

642. An approximate return was made of the value of articles manufactured in the twelve months ended with February, 1891, and the net result has already been stated to be £10,694,106.§ If this amount be added to the figures in the lowest line of the last column in the above table, a total of the gross value of the agricultural, pastoral, mining, and manufacturing produce will be obtained for the year 1890, amounting in the aggregate to £31,282,187.

Patents.

643. The patents for inventions applied for in 1890 numbered 1,017, or 66 more than in 1889, and a larger number than in any previous year. Since 1854 the total number of patents applied for has been 8,416.

* For prices of agricultural produce in different years, see table following paragraph 526 *ante*.

† The pastoral produce referred to is that derived from the live stock kept by farmers as well as that kept by graziers and squatters.

‡ Including the value of stone raised from quarries.

§ See paragraph 594 *ante*.

644. The first *Victorian Copyright Act** came into force in December, 1869. Copyrights—especially those for literary productions—have been increasingly numerous during the last six or seven years, during which period they averaged about 597 yer annum; whereas prior to 1883 the largest number registered was 347. The following copyrights have been registered since the passing of the original Act:— Copyrights.

COPYRIGHTS, 1870 TO 1890.

Subject of Copyright.	Copyrights Registered.		
	Prior to 1890.	During 1890.	Total.
DESIGNS.			
Articles of manufacture, chiefly of—			
Metals	323	23	346
Wood, stone, cement, or plaster ...	71	24	95
Glass	14	3	17
Earthenware	11	10	21
Ivory, bone, papier-mâché, etc. ...	65	8	73
Woven fabrics	18	...	18
Miscellaneous	19	1	20
LITERARY PRODUCTIONS.			
Literary works	4,021	494	4,515
Dramatic ,, ...	126	6	132
Musical ,, ...	110	2	112
WORKS OF ART.			
Paintings	8	1	9
Drawings	32	6	38
Engravings	1,302	25	1,327
Photographs	1,132	53	1,185
Sculpture	5	...	5
Total	7,257	656	7,913

645. Provision for the registration of trade-marks was established under the *Trade Marks Registration Act* 1876, which came into operation on the 22nd September of that year. The law has since been amended, and is now embodied in the Consolidated Act (54 Vict. No. 1146). The registration of a person as the proprietor of a trade-mark is *primâ facie* evidence of his right to its exclusive use, subject to the provisions of the Act as to its connexion with the good-will of a business. From the period of the commencement of the Act to the end of 1890, 2,577 trade-marks were submitted for registration, and 1,724 were registered. During the year 1890, the number submitted was 267—or 30 less than in 1889; and the number registered was 170—or 34 less than in 1889. Trade marks.

* 33 Vict. No. 350, repealed and re-enacted by 54 Vict. No. 1076.