

PART 7

PRIMARY PRODUCTION

Land Settlement and Irrigation

Land Utilization

Introduction

The climatic conditions of Victoria (for details see pages 45 to 64) and especially the incidence of rain have resulted in the development of a wide range of farming practices, but at the same time have been largely responsible for restricting the number of enterprises on individual farms. Farming is generally carried out on a single enterprise basis, a major exception being the association of cereal growing and sheep grazing in the main wheat areas. Other exceptions occur on a less extensive scale with other forms of production.

Most farms in the State are owner-operated and, with the exception of the larger holdings, the routine work on the farm is carried out by the farmer and his family, but at times of peak labour requirement, such as during shearing or harvest, additional labour is employed.

Considerable areas in the State are retained as forest reserves and for water catchments (see page 464).

The pattern of land use is more or less clearly defined in each of the statistical districts (see map on page 489). Thus the Mallee and the northern part of the Wimmera District are used almost exclusively for cereal production and sheep raising. The more intensive carrying of livestock in these districts has been made possible by a channel system of domestic and stock water supply originating in the mountainous area of the Grampians to the south. The agriculture of the Northern District is based largely on irrigation and ranges from dairying to fruit production. The non-irrigated parts of the district are used for cereal and sheep production. In the Western, Central, North-Central, North-Eastern, and Gippsland Districts, the rainfall is heavier and more reliable; consequently, there is more diversity in land utilization. In these districts, sheep grazing and dairying are the most important industries. Cultivation is generally limited. Some wheat is grown in the North-Eastern and Western Districts and there is some production of potatoes, vegetables, and other intensive cultivation crops on the more fertile soils in the higher rainfall parts.

Mallee District

This district is situated in the far north-west of the State and has a total area of 10·8 mill. acres. However, there are extensive areas in the north and west which, because of water shortage and the liability to severe soil erosion, have not been settled, and the total area used for agricultural production is 7·5 mill. acres.

The soils of the district being light in texture are easily and cheaply cultivated and the main farming enterprise is cereal cropping, associated with wool, and fat lamb production. The principal crop grown is wheat and the area sown to this crop averages about 1.3 mill. acres. In addition, some 300,000 acres of oats, including 15,000 acres for hay and 50,000 acres for grazing, and 65,000 acres of barley are usually grown. Yields from cereal crops vary widely, according to seasonal conditions. The average district yield per acre for wheat in recent years has been close to 19 bushels.

The lack of suitable pasture species has been a problem in pasture development and, in the past, grazing has been provided largely by native pastures, green cereal crops, and crop stubbles. More recently, wider use has been made of dry land lucerne and medics in rotation with crops, with benefit to both crop production and grazing. The district carries about 1.7 mill. sheep and produces about 17 mill. lb. of wool as well as a substantial number of early fat lambs for the Melbourne market.

Irrigation areas located close to the River Murray, which marks the northern boundary of the State, produce most of the State's (and Australia's) dried vine and citrus fruits.

Wimmera District

The Wimmera occupies the central western part of the State and has an area of 7.4 mill. acres, of which 6 mill. acres are used for agricultural purposes. Rainfall in the north is about 14 in. per year, increasing to 25 in. in the south. The Grampians in the south of the district have a higher rainfall. This area is unsuited to agricultural production and is retained by the Crown as a watershed area and forest reserve.

There are wide variations in soil type, but the district includes substantial areas of fertile self-mulching clay loams, which are among the most productive wheat-growing soils in Australia. South and east of the Grampians the soils are podzols and in the south-west there is a large area of light-textured grey soils.

Wheat farming in association with fine-wool growing or fat lamb production is the main farm enterprise over the north and central Wimmera. Both climate and soils are suited to cereal cropping and yields obtained are high. The area sown to wheat averages about 900,000 acres, the average yield being close to 25 bushels per acre. Other major crops are oats (265,000 acres, including 27,000 acres for hay and 18,000 acres for grazing), and barley (35,000 acres). In recent years the development of suitable strains of medics and clovers has encouraged the inclusion of a pasture phase in crop rotations.

In addition to mixed sheep and wheat farming, there are extensive areas, particularly in the south and west of the district where rainfall is higher and pasture establishment easier, which are used solely for grazing. Almost three-quarters of the sheep carried in the area are Merinos, and, although a number of early fat lambs come from the wheat-growing areas, emphasis here is more generally on fine-wool

production and breeding. The district carries over 4 mill. sheep and produces more than 45 mill. lb. of wool. As is the case in the Mallee, dairying and beef cattle production are only of minor importance.

Northern District

This is an area of plains country extending from the Central Highlands in the south to the River Murray in the north. The total area of the district is 6.3 mill. acres, of which 5.5 mill. acres are occupied for agricultural purposes. The soils vary from typical light Mallee soils in the north-west to fertile red-brown earths in the east. Average annual rainfall is 14 in. in the north-west and increases to 25 in. over the foothills of the ranges, which are on the eastern boundary of the district. The district includes the major irrigation areas of the State, and because of this several different farming enterprises are carried out.

Wheat growing is an important industry. The area sown averages about 550,000 acres, and, because of climatic and soil differences, yields vary widely across the area, the district average being 24 bushels per acre. As in the other major wheat-producing districts, oat crops are an important feature in rotations and for grazing. In the Northern District over 220,000 acres of oats are sown each year, including 30,000 acres for hay and 16,000 acres for grazing.

The district carries about 4 mill. sheep, largely on wheat farms, and emphasis is on fat lamb production rather than fine-wool growing. Extensive irrigation has made it possible to establish highly productive perennial pastures which are used mainly for dairy production, but, in addition, the irrigation areas fatten sheep and lambs from the non-irrigated areas in Victoria and New South Wales. The milk produced is mostly used for butter, cheese, and other manufactured products, but small quantities are used for city whole milk supply. There are over 380,000 dairy cattle in the district.

Apart from dairying, irrigation has permitted the establishment of an important fruit-growing industry. This area supplies fresh fruit to Victorian and interstate markets and also provides fruit, mainly apricots, pears, and peaches, for the important canneries operating in the district.

North-Central District

This district includes much of the Central Highlands area and the rainfall is generally over 30 in., but on the northern slopes it is as low as 22 in. There is wide variation in topography and soils and much of the area is used for grazing sheep and beef cattle. However, the district is relatively small, containing only 2.9 mill. acres, of which 2.1 mill. acres are occupied and used for farming production.

Cereal cropping is unimportant, but potatoes in the area north-east of Ballarat and fruit in the Harcourt area are the most important crops grown. Although dairy farms are scattered throughout the district, it is marginal for this form of production and emphasis is on sheep production associated with beef production. The district carries over 2 mill. sheep and about 80,000 beef cattle.

North-Eastern District

The district has a total area of 7·2 mill. acres, but includes substantial areas of Crown lands, much of which is very steep and heavily timbered. The area occupied is 3·7 mill. acres. Annual average rainfall varies from 20 in. in the north-western corner of the district to well over 60 in. over the mountains. Almost all of the area used for rural production has a 20 to 30 inch rainfall.

Although cereal cropping is not general, there is an interesting development of ley farming based on subterranean clover pastures. However, areas concerned and production are small in relation to the State totals. The fertile river valleys are suited to specialty crop production, and some 8,500 acres of tobacco and small quantities of hops are grown in these areas. The district carries about 150,000 dairy cattle, mainly along the river valleys.

Fat lamb growing and crossbred wool production are the main sheep enterprises in the north-western and western parts of the district, but fine-wool growing is more common on the unimproved pastures along the Murray Valley and in the Omeo area. The district carries about 2 mill. sheep.

The North-Eastern District is an important beef cattle breeding and fattening area, and over 240,000 head are carried. The cattle make good use of the rough pastures of the foothill country and the productive pastures of the flats make suitable fattening areas.

Western District

Most of the district falls in the 25–30 inch rainfall belt, but an area north and east of the Otways is influenced by a rain shadow effect and the average annual rainfall is 20 to 25 in. In the Otway Ranges the average annual rainfall is as high as 70 in. The soils of the district vary considerably in type and fertility. The great bulk of the plains area consists of basaltic soils. In the north the soils are similar to those of the southern Wimmera. The total area of the district is 8·8 mill. acres, of which 6·6 mill. acres are occupied. There are substantial areas of forest reserve in the Otways, which are in the south-eastern part of the district.

The only cereal crop of importance grown is oats which are used as a fodder crop, cut for hay, or harvested for grain which is also used very largely to feed stock. The more fertile soils produce both potatoes and onions, and about 60 per cent. of the State's onion acreage is located in the district. However, emphasis is placed on animal production, and climatically the district is well suited to the development of improved pastures. It is the major wool producing area of the State, carrying over 9·8 mill. sheep. Almost half the total sheep population is Merino, and the fine wool breeds—Merino, Polwarth, and Corriedale—make up nearly three-quarters of the total sheep population. There are relatively few crossbreds, and fat lamb production does not have the same importance as in other districts. The Western District is an important beef cattle breeding and fattening area and carries close to 380,000 head. Many of the State's leading stud herds are located in the district, and in addition, many sheep properties carry beef cattle.

Dairying is an important industry and there is widespread distribution of dairy cattle. However, the main concentrations are in the following areas :—Colac, Camperdown, Koroit, Allansford, and the Casterton—Coleraine region. A proportion of production is used as whole milk for town supply, but a considerable proportion of the State's processed milk products and butter are produced in the district, which carries about 430,000 dairy cattle.

Central District

Rainfall varies from 20 in. in the rain shadow area, north of Geelong, to more than 50 in. over the ranges north and east of Melbourne. Topographically there is variation from plains country on the western side of Port Phillip Bay to the steep hill country north and east of Melbourne. There is also a wide variation in soil type and fertility. The total area of the district is 4·1 mill. acres and 2·7 mill. acres are occupied—the remainder being reserved as forest and watershed areas.

The climate is suited to the production of malting barley and about 40,000 acres are grown—mainly on the plains to the west. Potatoes are grown in the Romsey—Ballarat area and market gardening is important close to Melbourne, Geelong, and Bacchus Marsh.

The district carries about 2·5 mill. sheep and production is almost evenly divided between fine-wool growing and fat lamb production.

Beef cattle are grazed in conjunction with sheep over most of the area, but in the east they are run with dairy cows to produce vealers.

The major dairying area is in the east, and this forms part of the most important dairying area of the State. The area is an important supplier of whole milk for city supply and for butter and cheese manufacture. There are just under 300,000 dairy cattle in the district. Pig production is also important.

Gippsland District

The total area of this district is 8·7 mill. acres, but the northern and eastern parts are mountainous and are reserved by the Crown. The area occupied is 3·6 mill. acres and the bulk of settlement is south of a line between Dandenong and Bairnsdale. Rainfall varies from just under 25 in. in the rain shadow area near Maffra and Sale to 60 in. and above in the highlands. Average annual rainfall over the most part of the settled areas is 30 to 40 in., and climatically the district is well suited to the development of highly productive perennial pastures. The soils range from poor sands to relatively fertile loams. The highly fertile alluvial soils of the river valleys are important sources of production.

With the exception of forage crops, cropping is not important in the area, although certain specialty crops, such as maize, beans, and potatoes, contribute substantially to the State's total production.

Gippsland is the most important dairying district of the State and dairying is by far the most important rural industry in the district. The highly productive pastures of the 30 to 40 inch rainfall areas are

the basis of the industry. The district supplies the greater part of the whole milk requirements for the Melbourne market, and in addition, plays an important part in the production of butter, cheese, and other processed dairy products. In addition, the dairy herds contribute to veal and beef production. The district carries nearly 500,000 dairy cattle. Pig raising is associated with dairy farming, and there are 65,000 pigs carried in the area.

In western and southern Gippsland, sheep production is small and consists largely of fat lamb producing flocks run in conjunction with dairy cattle. However, in the 22–30 inch rainfall area near Sale, fat lamb production on improved pastures is a major enterprise. In the foothills, fine-woolled sheep and beef cattle are carried.

Alienation of Land

The total area of the State is approximately 56,245,760 acres. On 31st December, 1963, this comprised :—

	Acres
Lands alienated in fee-simple	31,712,214
Lands in process of alienation	2,390,368
Crown lands	22,143,178
Total	56,245,760
 Crown lands comprise :—	
	Acres
Reserved Forest	5,580,237
State Forest and timber reserves (under Land Act)	150,974
Water reserves	315,440
Reserves in the Mallee	410,000
Other reserves	639,494
Roads	1,705,129
Water frontages, beds of rivers, lakes, &c., unsold land in cities, towns, and boroughs ..	3,845,383
Land in occupation under—	
Perpetual leases	175,576
Leases of former agricultural college lands ..	28,285
Other leases and licences	1,679
Temporary grazing licences and leases ..	*5,657,674
Unoccupied	3,633,307
Total	22,143,178

* In addition, 72,643 acres of land listed under Reserves are held under grazing licences.

In the following table are shown the area of Crown lands sold absolutely and conditionally, and the area of lands alienated in fee-simple during the five years 1959 to 1963. A portion of the area conditionally sold reverts to the Crown each year in consequence of the non-fulfilment of conditions by the selectors. The lands alienated each year include areas selected in previous years.

VICTORIA—ALIENATION OF CROWN LANDS

Year Ended 31st December—	Area of Crown Lands Sold			Crown Lands Alienated in Fee-simple	
	Absolutely, at Auction, &c.	Conditionally to Selectors	Total	Area	Purchase Money
	acres				\$
1959.. ..	30,972	51,075	82,047	123,202	621,790
1960.. ..	3,740	38,532	42,272	129,939	562,346
1961.. ..	16,315	42,070	58,385	99,805	552,056
1962.. ..	3,584	11,299	14,883	103,337	616,674
1963.. ..	3,308	19,425	22,733	103,766	326,934

**Transfer of Land Act and Assurance Fund, 1961
Government Assistance to the Farming Industry, 1964**

Soil Conservation Authority

Functions

The Authority is responsible for the mitigation and prevention of soil erosion ; promotion of soil conservation ; and the determination of land use to achieve these objectives.

To perform these functions, the Authority conducts surveys and investigations into the nature and extent of soil erosion. It investigates and designs preventive and remedial measures, and carries out soil conservation works, experiments and demonstrations of soil conservation, and reclamation of eroded lands.

It co-ordinates the policies and activities of Government departments and public authorities for the alienation and use of Crown lands and has powers in regard to the removal of stone, gravel, and soil by Government departments and public authorities.

The Chairman of the Authority is also Chairman of the Land Utilization Advisory Council, which operates under the same Act.

Soil, Land-use, and Ecological Surveys

The Soil Conservation Authority is undertaking a series of soil, land-use, and ecological surveys which will cover the whole of Victoria. Approximately one-half of the State has already been surveyed in this manner and as each area is completed the results are published. The basic aim of these surveys is to determine areas of land with similar potential, problems, and hazards and to understand the processes involved in reaching ecological stability in different kinds of land.

The surveys require the delineating and describing of areas where climate, parent material, topography, and original vegetation are uniform within limits decided upon as significant for the likely form of land-use. The areas vary considerably in size. For example, the survey covering the low-rainfall Mallee in the north-west of Victoria embraces over 14,000 sq. miles ; another in south-western Victoria about 4,600 sq. miles ; while others may be only a few hundred square miles.

Four mapping units are used : *land component*, *land unit*, *land system*, and *land zone*, the first of which is the fundamental unit and nearly always occurs as a small area. For all practical purposes the *land component* may be considered to be uniform if any variation of the factors within it are unlikely to have a significant effect on the suitability of the area for the anticipated level of land-use.

A *land-unit* contains a limited number of *land components* in a characteristic pattern of repetition sequence. *Land systems* are larger in area again and contain an agglomeration of sequences or patterns occurring in the environment. A *land zone* is a primary sub-division of a very large area of the country, such as the Mallee, in which the boundaries coincide with significant differences in climate, soils, vegetation, and topography.

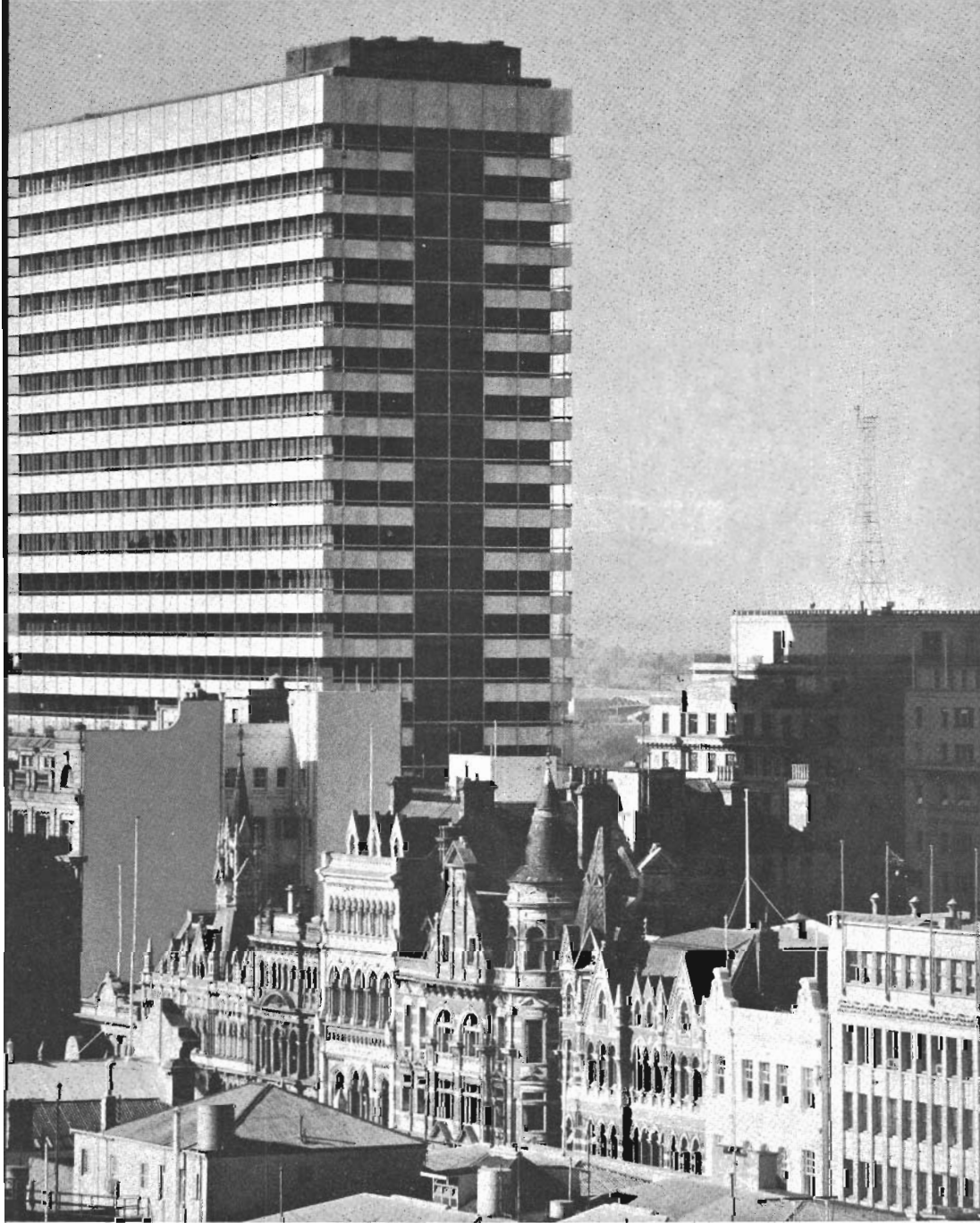
This knowledge is valuable not only in deciding the development of virgin country, but also in determining the suitability of otherwise unattractive land for such special purposes as pine plantations, and also for correcting mistakes or improving methods of past and current land husbandry.

Soil Conservation Authority, 1961–1965
Land Utilization Advisory Council, 1962
Destruction of Vermin and Noxious Weeds, 1963

Rural Finance Facilities

Introduction

Australia's national policy for permanent land settlement has been based on the family unit farm. Financially this has seldom been easy because even in the early days settlers found it difficult to earn enough to maintain themselves whilst they were clearing and developing their blocks. The conditions of purchase were made very easy but considerable aggregation of holdings took place because settlers failed. Later, some of these large estates were re-purchased, subdivided, and the smaller farms made available to settlers under closer settlement schemes.



[Gordon F. De'Lisle

The new National Mutual Centre rises above some of Melbourne's historic buildings. It occupies the site of the former Western Market.

Victoria Today



(Gordon F. De'Lisle)

Victoria's coastline shows considerable variety. The sand dunes along the Ninety Mile Beach are typical of this part of the eastern Victorian coast.

Loch Ard Gorge, Western Victoria, shows a more rugged facet of the Victorian coastline.

[Australian National Travel Association]



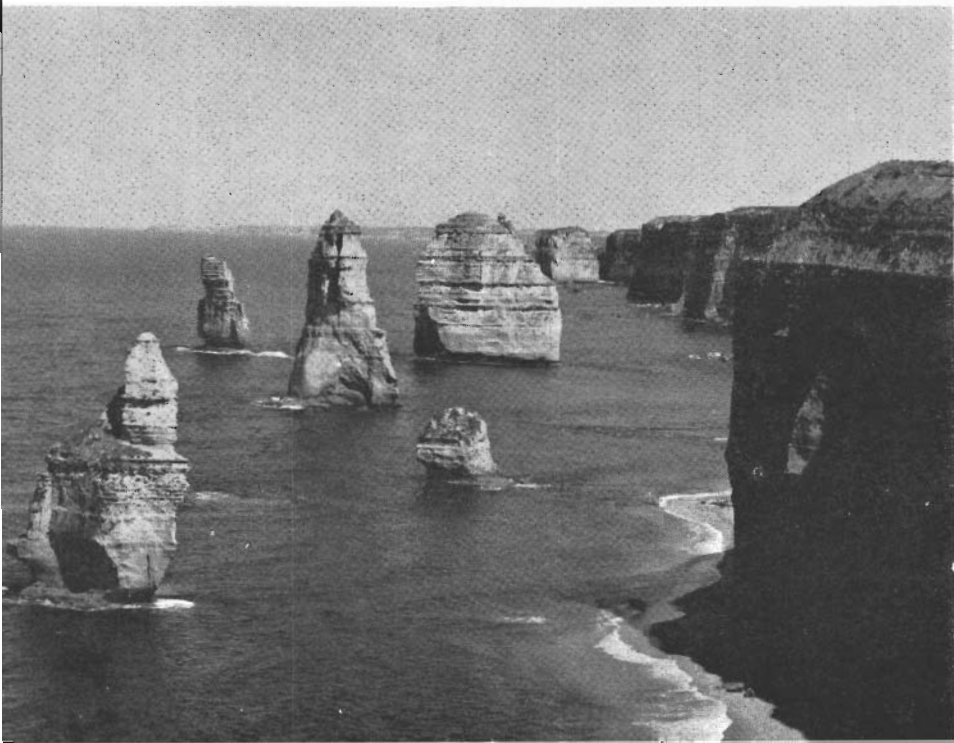


[Dr. L. H. Smith

Refuge Cove on the east coast of Wilson's Promontory —a useful haven for ships in rough weather.

The Apostles, monuments in limestone, at Port Campbell National Park on the western coast of Victoria.

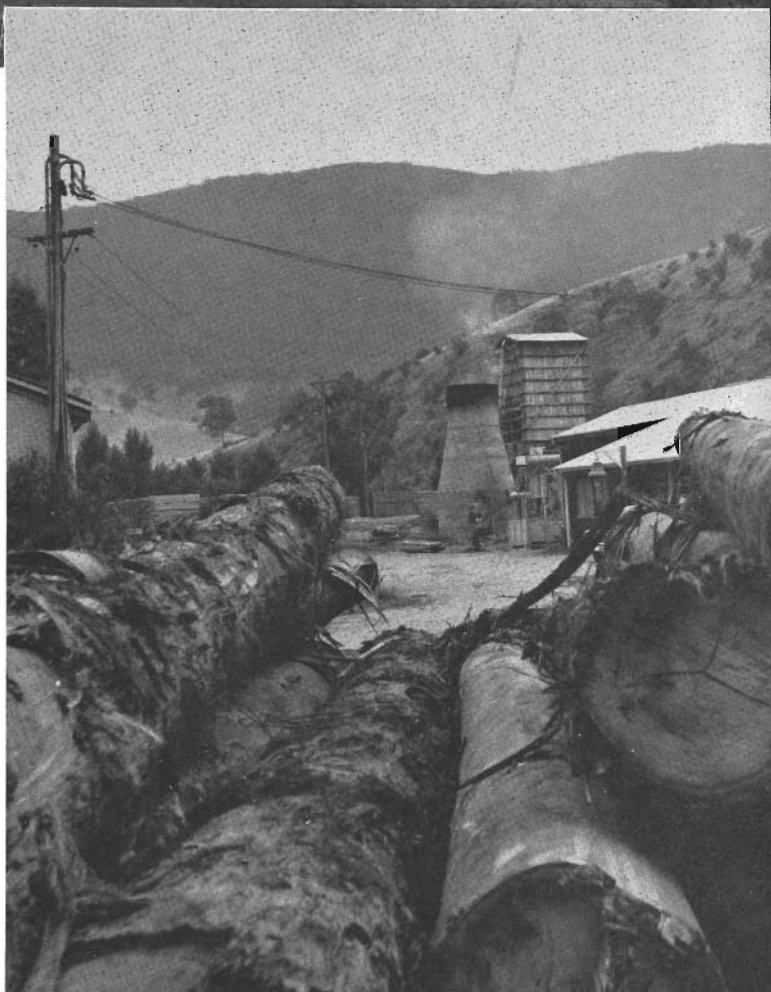
[Dr. L. H. Smith





[Department of Agriculture

Land settlement in the Heytesbury District showing settlers' homes and outbuildings on a recently cleared property.



Logs at a Gippsland saw mill. In the year 1963-64 the volume of logs obtained from State forests was 468 mill. super ft.

[Forests Commission of Victoria



Hereford cattle feeding on grass hay on a property near Benalla.

[Department of Agriculture



International Harvester Co. of Australia Pty. Ltd.

A combination frequently seen in the cereal growing areas—a Victorian-made 55 h.p. tractor pulling and providing power for a header harvester.

Headers on the assembly line at Sunshine.

[Massey-Ferguson (Aust.) Ltd.]



The production line for making pre-cast concrete panels which are used in many Housing Commission building projects.

[Housing Commission of Victoria



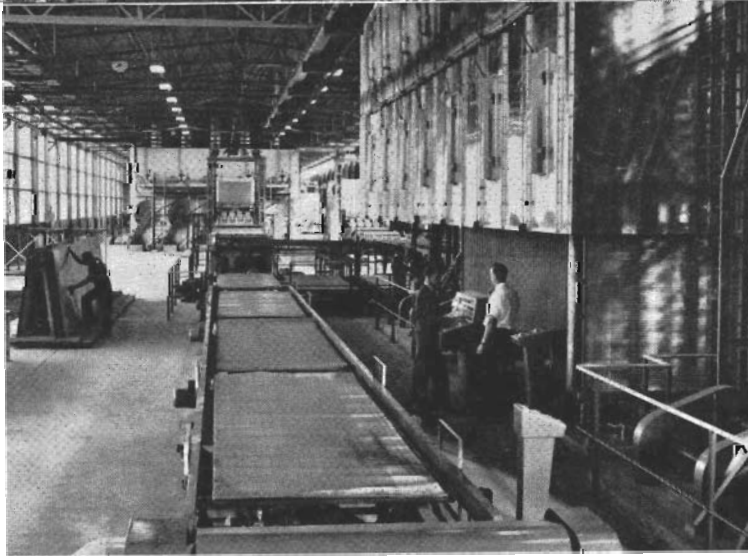
Hoisting pre-cast concrete panels into place on the fifth floor of the twenty storey block at Debney's Estate, Flemington.

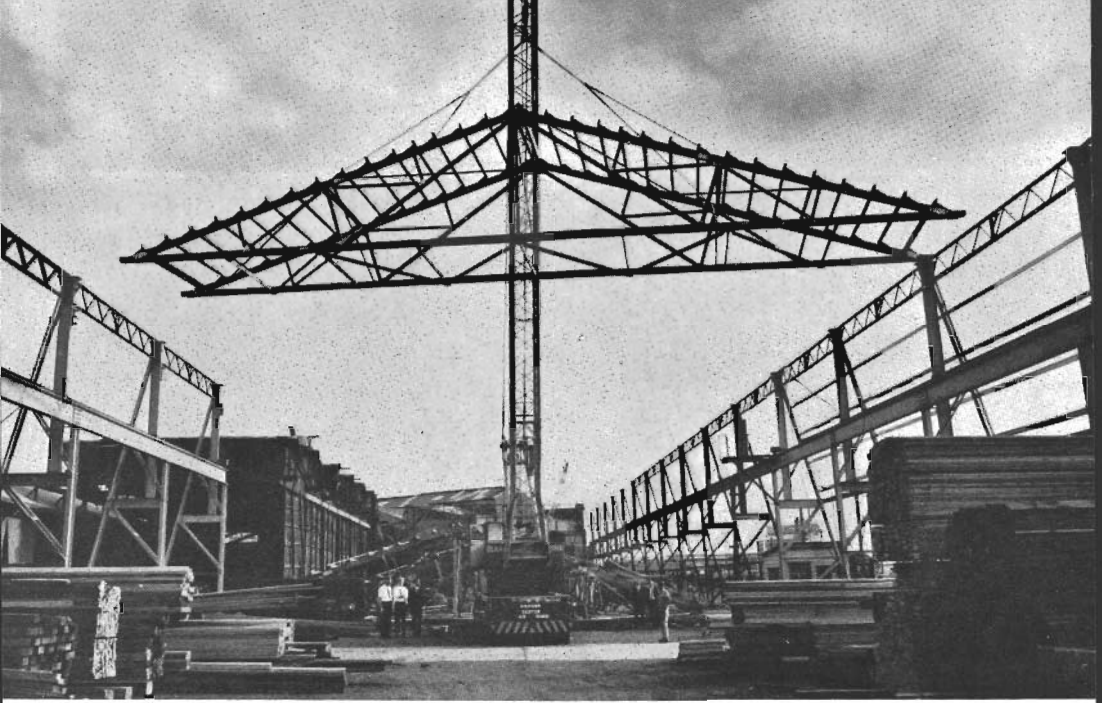
[Housing Commission of Victoria



The manufacture of hardboard in a mill at Bacchus Marsh.

[Colonial Sugar Refining Co. Ltd.—
Building Materials





[William Waller

A 73 ft. span, 12½ ft. wide timber truss assembly being hoisted into position during building.



[Australian Aluminium Co. Ltd.

The use of aluminium is illustrated above at Kew Swimming Pool.

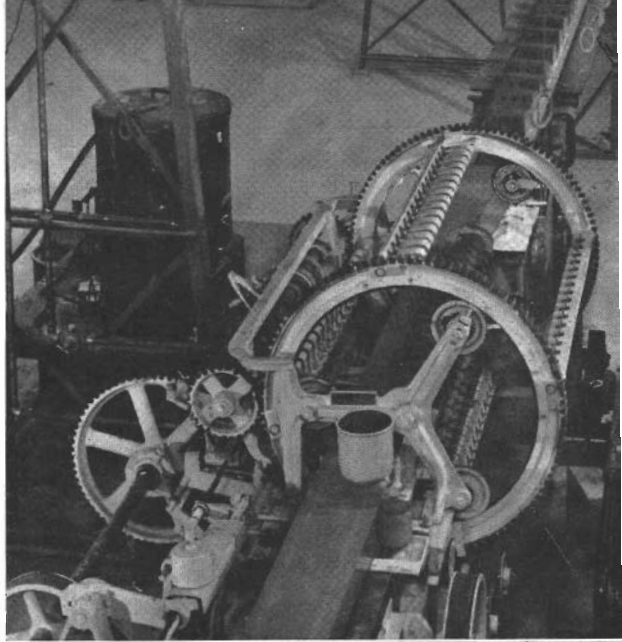


Roofing of interlocking 20 ft. long galvanized steel units with continuous fibre glass roof lights.

[Wolfgang Sievers

Clay extrusion being fed into a wire cutting reel for slicing into bricks.

[*Wolfgang Sievers*]



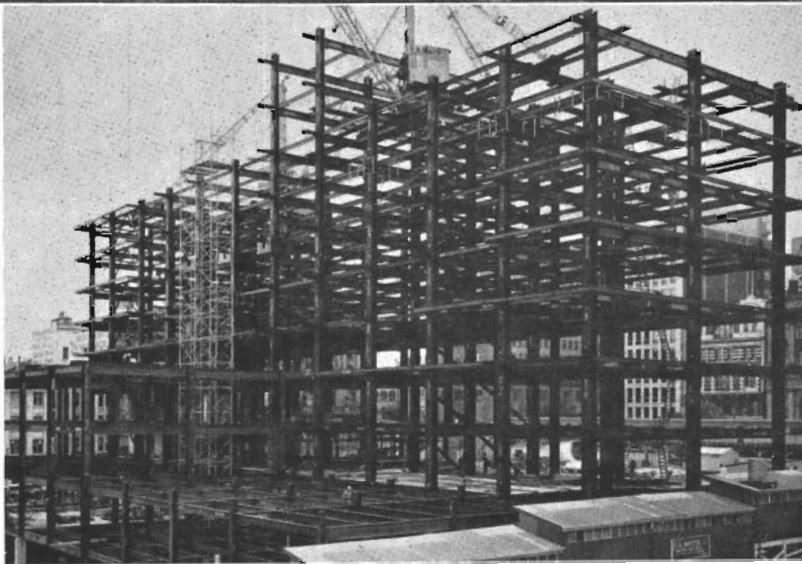
The first stage in the manufacture of cement: the limestone quarry at Batesford, near Geelong, showing two ridges of earthen overburden above the limestone face.

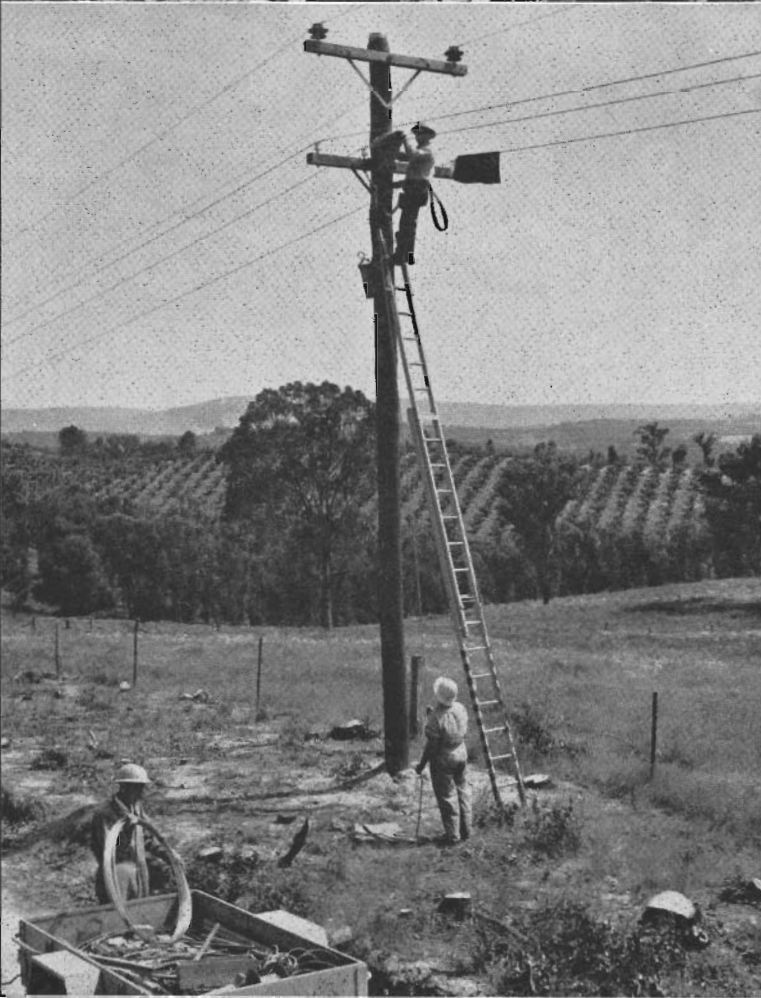
[*Australian Portland Cement Ltd.*]



Structural steel framework being erected during construction of a large city building.

[*Johns and Waygood Ltd.*]





[State Electricity Commission of Victoria]

Electricity is widely used for many purposes in irrigation areas. Seen here are sprays operated by an electric pump on a tobacco crop near Cohuna in the Murray Valley.

Between 2,500 and 3,000 miles of new power line are erected each year by the State Electricity Commission of Victoria, and of this mileage more than 90% is outside the Metropolitan Area.

[State Electricity Commission of Victoria]



The main concourse of Spencer Street Station, viewed from the southern end of the waiting gallery. [Victorian Railways

The main entrance to 'Telepost', Melbourne's first automatic self service post office providing a 24 hour service to the general public.

[Postmaster-General's Department





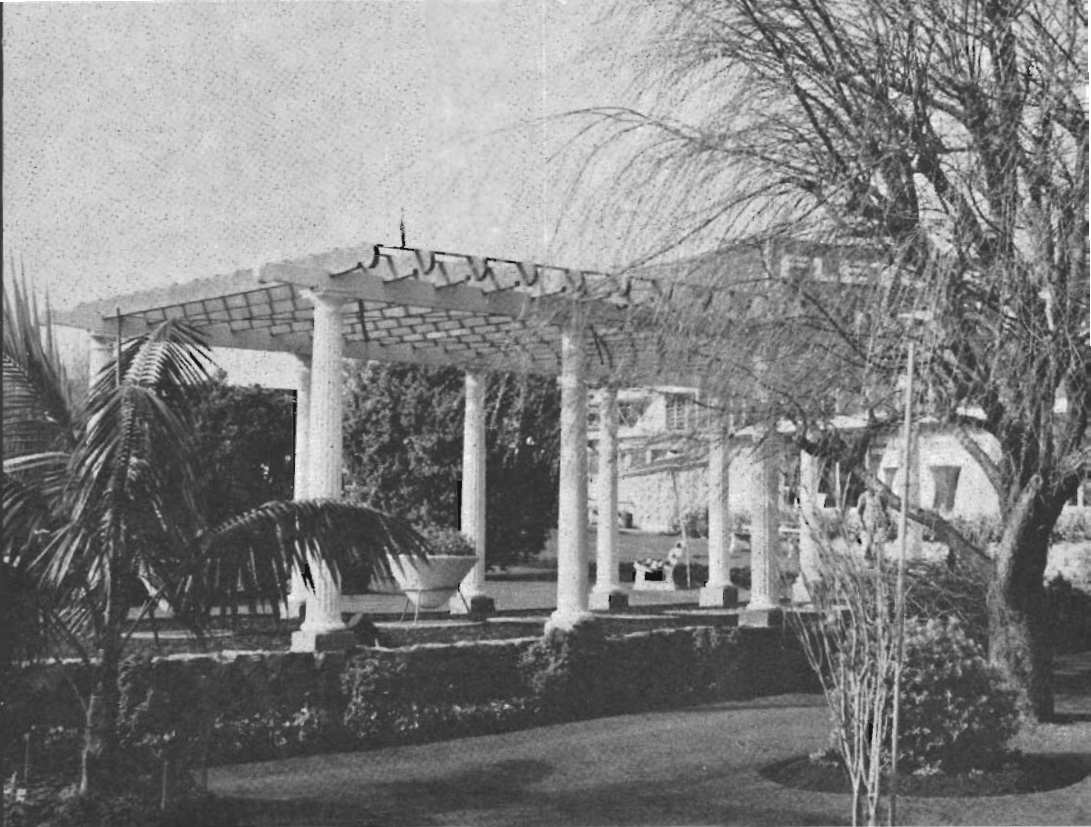
Aerial view of Warrnambool looking north-east from the beach.

[J. A. Welsh

A view in the Botanic Gardens at Warrnambool.

[Commonwealth Bureau of Census and Statistics



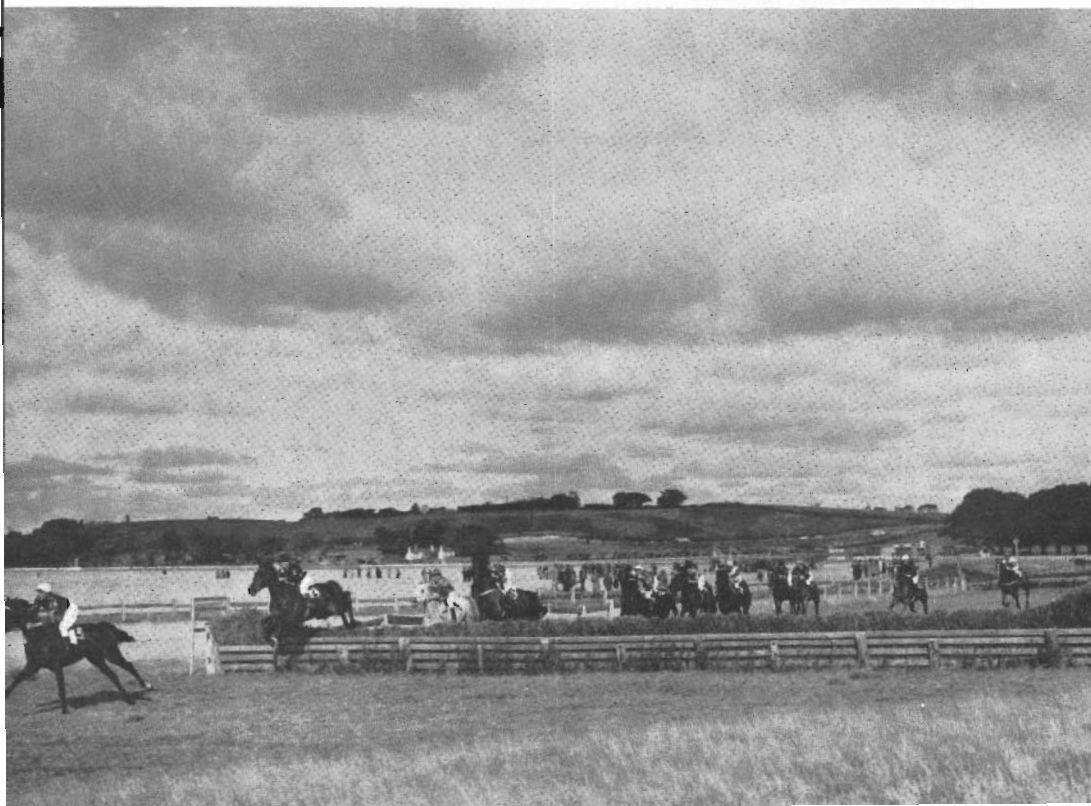


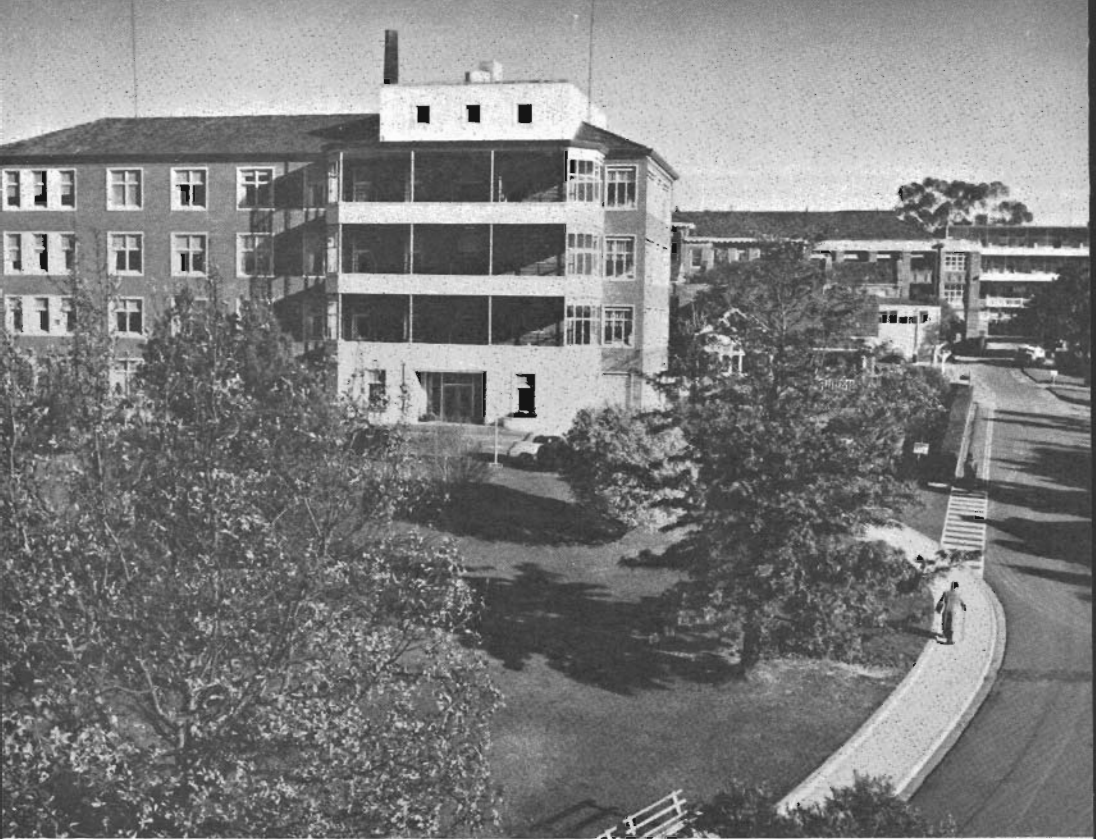
[Commonwealth Bureau of Census and Statistics

A factory in a garden setting at Warrnambool.

Grand Annual Steeplechase at Warrnambool.

[Tourist Development Authority of Victoria





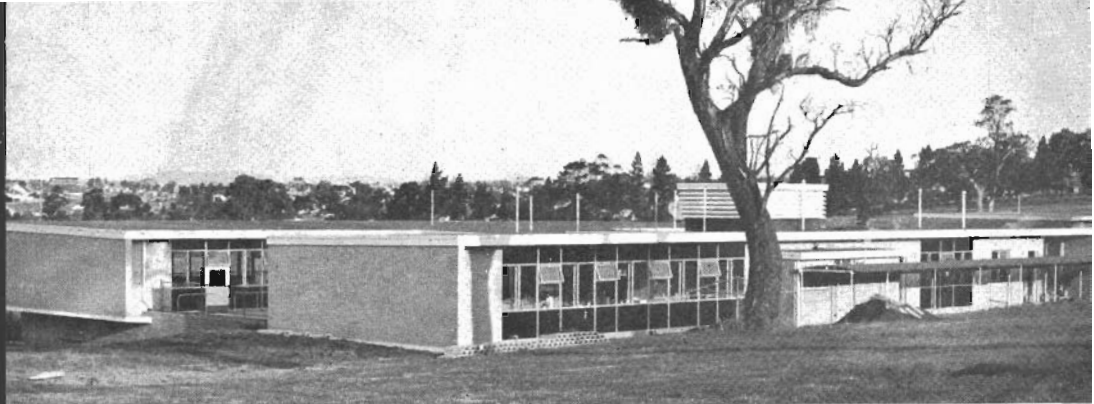
[Austin Hospital

A view of the Austin Hospital at Heidelberg.

Nurses' Station at the new Sandringham and District Memorial Hospital.

[Hospitals and Charities Commission





[*Mental Hygiene Authority*]
New Dependent Patients Ward, Children's Cottages, Kew.

Some of the Horsley Court units at Brighton especially built for elderly people.

[*Old People's Welfare Council*]



Young musicians at a summer school of music at Geelong.

[*Australian News and Information Bureau*]





[National Gallery of Victoria

This Venetian flat point lace chalice cover dates from the sixteenth century A.D. It was purchased in 1964 under the terms of the Felton Bequest and is part of the Pollen Collection of lace now in the possession of the National Gallery of Victoria.



Part of an Italian linen lectern cover (c.1540 A.D.), a good example of the drawn thread work of the period.

[National Gallery of Victoria

After the two world wars these schemes were expanded to enable ex-servicemen to acquire farms under generous terms of settlement. In addition, money was advanced to returned servicemen to enable them to buy their own "Single Unit" farms. Soldier settlers were also granted loans for the purchase of stock, plant, and equipment.

The State set up a Rural Finance Corporation with wide powers for assisting rural industry. This was later merged with the Soldier Settlement Commission into a Rural Finance and Settlement Commission.

The Commonwealth Bank has had a Rural Credits Department for many years. Its main function is to provide seasonal assistance in the marketing of products. Thus it cushions the effect of large interim payments at harvest time and provides credit for goods awaiting shipment or in transit. It also assists in financing research. The Commonwealth Development Bank is interested in making loans available for the improvement of approved properties.

The trading banks have many farmer clients who require finance mostly on a relatively short-term seasonal basis. Numerous pastoral finance companies act as agents for farmers and frequently provide credit for the purchase of properties or for their improvement or for the purchase of livestock. The State Savings Bank also makes limited financial advances to farmers.

Rural Finance and Settlement Commission

General

The Rural Finance and Settlement Commission was established by legislation passed in 1961, which began to merge the former Soldier Settlement Commission and the Rural Finance Corporation. The new Commission carried out the functions of the previous authorities temporarily in two separate branches, viz., those of Settlement and Finance, respectively, until further legislation passed in 1963 completed the merger by removing this division and co-ordinating the functions previously performed by the two separate authorities.

Rural Finance Act

The Rural Finance Corporation was established in April, 1950. Its functions, which have since been taken over by the Commission, include the making of advances through loans at low rates of interest to existing or proposed country industries, both primary and secondary. The Commission is also empowered to advance moneys to, or for the benefit of, any farmer for carrying into effect a composition or scheme of arrangement between him and his creditors.

Revenue, expenditure, &c., for each of the five years 1959-60 to 1963-64 is given in the following table :—

VICTORIA—RURAL FINANCE ACT : REVENUE,
EXPENDITURE, ETC.
(\$'000)

Particulars	1959-60	1960-61	1961-62	1962-63	1963-64
REVENUE					
Interest	810	874	950	1,040	1,145
Other	20	24	40	50	20
Total Revenue .. .	830	898	990	1,090	1,165
EXPENDITURE					
Administration	108	116	120	110	134
Interest	522	556	598	730	797
Sinking Fund	40	40	44	46	50
Other	18	32	24	24	108
Total Expenditure .. .	688	744	786	910	1,089
Net Surplus	142	154	204	180	76
Loans and Advances Outstanding at 30th June	17,462	18,730	19,718	20,340	21,168
Loan Indebtedness to State Government at 30th June	15,672	16,646	17,812	19,032	20,208

General Settlement

Prior to the end of the Second World War, the Commonwealth Government and various State Governments made arrangements for the settlement of discharged soldiers on the land as part of a general scheme of rehabilitation of ex-members of the services. In 1945, the Victorian Government completed an Agreement with the Commonwealth Government. The State Parliament ratified the Agreement and also passed legislation constituting the former Soldier Settlement Commission. Soldier Settlement in all States has now reached the stage where, apart from forfeited holdings, no further allocations of blocks are visualized.

Under the Victorian legislation, soldier settlement was carried out under two separate schemes. First, there was the general settlement scheme where the Commission acquired freehold land or Crown land for subdivision and development into holdings for application by ex-servicemen. Such holdings were allocated on a competitive basis, having regard to the merits of all the applicants. The number of ex-servicemen settled under this scheme totalled 3,285. Secondly, there was the Single Unit Farm Scheme, where ex-servicemen were granted loans up to a maximum of \$18,000 to assist them in the purchase of existing farms of their own choosing. Under this scheme 2,878 ex-servicemen were granted loans amounting to \$23,916,938.

The Soldier Settlement Act enabled the Commission to make advances to general settlers and Single Unit Farm settlers to assist them in the purchase of stock, plant, and equipment. For this purpose \$12,244,848 has been advanced to settlers and at the 30th June, 1964, \$11,681,296 has been repaid, \$20,234 has been written off, leaving an outstanding balance of \$543,318. In addition to its functions under the Soldier Settlement Act, the Commission, on behalf of the Commonwealth Government, administered that portion of the *Commonwealth Re-Establishment and Employment Act 1945*, which related to agricultural loans and allowances.

With soldier settlement in its final stages, the following tables set out the particulars of rural rehabilitation of ex-servicemen in Victoria as at the 30th June, 1964 :—

VICTORIA—LAND ACQUIRED AND COST OF DEVELOPMENT, 1945 TO 1964

Particulars	Total Expenditure to 30th June, 1964		Balance Outstanding at 30th June, 1964
	acres	\$	\$
Freehold Land	1,193,171	39,430,980	2,569,888
Crown Land	51,536		
Development and Improvement of Holdings .. .. .	..	53,807,608	
	Total Realizations to 30th June, 1964		
	acres	\$	
Sales of Land Not Required for Soldier Settlement	64,415	3,131,294*	552,974*

* Sale price of land not required for settlement; balance outstanding represents instalments not yet due where terms were given to purchasers, who are not necessarily ex-servicemen.

VICTORIA—ADVANCES TO EX-SERVICEMEN, 1945 TO 1964

Act	Total Advances to 30th June, 1964		Advances Outstanding at 30th June, 1964	
	No.	\$	No.	\$
Soldier Settlement Act—				
Advances for Settlers' Lease Liability*	2,982	55,824,042	2,531	44,511,858
Advances to Assist in Acquiring and Developing Single-unit Farms	2,878	23,916,938	1,492	11,074,868
Advances for Improvements, Stock, Implements, &c. ..	†	12,244,848	431	543,318
Advances for Shares in Co-operatives	327	250,328	..	..
Commonwealth Re-establishment and Employment Act—				
Advances to Assist Rehabilitation in Farming Industry	2,970	3,593,702	288	118,084

* The total number of settlers allocated holdings is 3,285 which includes 237 holdings re-allocated and 17 holdings disposed of. Some 49 settlers have yet to receive their lease liabilities.

† Not available.

Other Land Settlement

The *Land Settlement Act* 1959 extended the functions of the then Soldier Settlement Commission in that, under such Act, the Commission was given authority to administer a new land settlement scheme to cater for those men wishing to become farm owners—many of whom were too young to have been ex-servicemen and thus eligible for soldier settlement. The scheme generally is based on the same principles as the scheme for soldier settlement—the main differences being the interest rates payable and the basis of determining the capital liability of the settler for the farm. There is no provision in the Act for advances to buy single unit farms. The Commission is given authority to purchase privately-owned land or set apart suitable Crown land for development and subdivision.

Any male British subject over the age of 21 years is eligible to apply for land made available, but the actual allocation is made on a competitive basis, having regard to a number of factors laid down in the Act, including the applicant's experience in farming and prospects of success.

A feature of the legislation is that the farms are either brought to, or within sight of, production before allocation. Further details about the general principles of this legislation will be found on pages 494 to 496 of the Victorian Year Book 1963.

Up to the 30th June, 1964, the land being developed for allocation under this scheme has been on three developmental projects. These are at Heytesbury near Cobden, Yanakie on Wilson's Promontory, and the East Goulburn Project near Shepparton.

The demand for all holdings allotted to date has been exceedingly keen and the 275 farms allocated (206 dairying and 69 soft fruit) attracted nearly 8,000 applications.

At the 30th June, 1964, the position of other land settlement in Victoria under the *Land Settlement Act* 1959 was as follows:—

VICTORIA—OTHER LAND SETTLEMENT, 1959 TO 1964

Particulars	Total Expenditure to 30th June, 1964		Balance Outstanding at 30th June, 1964	
	acres	\$	\$	
Land Acquired—				
Freehold Land Purchased ..	17,598	1,275,082	15,356,982	
Crown Land	80,851			
Development and Improvement of Holdings .. .. .	..				14,331,770
	Total Realizations to 30th June, 1964			
	acres	\$		
Sales of Land Not Required for Settlement	1,998	106,060*	21,900*	
	Total Advances to 30th June, 1964		Advances Outstanding at 30th June, 1964	
	No.	\$	No.	\$
Advances to Settlers under the Land Settlement Act ..	†	373,312	243	275,418

* Sale price of land not required for settlement; balance outstanding represents instalments not yet due where terms were given to purchasers.

† Not available.

Other Rural Finance Facilities

State Savings Bank of Victoria

State Savings Bank loans for rural purposes fall into two categories :—

(1) Credit Foncier Department loans are long-term advances to enable borrowers to purchase or improve farms. The maximum loan available from this source is \$7,000 carrying interest at $4\frac{3}{4}$ per cent. per annum and repayable over 10 years (subject to renewal). The maximum loan must not exceed three quarters of the value of the property. Particulars of advances, repayments, &c., for the year ended 30th June, 1964 may be found on page 663.

(2) Savings Bank Department loans are advances of larger amounts—the maximum loan is \$20,000—and are available on the security of first mortgage over freehold property. These are short-term loans extending over a period of 3 years, but are subject to renewal. Interest charged is either $5\frac{1}{2}$ or 6 per cent. per annum depending on whether the property is occupied by the borrower or whether the loan exceeds \$10,000. The maximum loan must not exceed two thirds of the value of the property.

Reserve Bank of Australia—Rural Credits Department

The Rural Credits Department was established in 1925 as a department of the Commonwealth Bank of Australia, now known as the Reserve Bank of Australia. Its function is to provide finance to statutory marketing boards and similar authorities and to co-operative associations of primary producers. Advances are used by borrowers principally for making payments to growers for their primary produce pending its sale and to finance marketing expenses which in some cases include processing and packing of the commodity.

Finance for the marketing of wheat, and to a lesser extent, dairy products and barley has comprised the major portion of accommodation provided, but the Department's operations have also covered such commodities as tobacco, canning fruits, dried fruits, meat, eggs, and fertilizers.

The interest rates for advances during the year ended 30th June, 1964 were 4 per cent. per annum, if against the security of a Commonwealth or State Government guarantee, and $4\frac{1}{2}$ per cent. per annum against other securities.

Grants have also been made by the Rural Credits Development Fund for research and extension work to assist the development of primary industries. The Fund is financed by one half of the annual net profits of the Rural Credits Department.

Commonwealth Development Bank

A brief outline of the functions of the Commonwealth Development Bank, together with particulars of rural advances outstanding at 30th June, 1964 may be found on pages 659 to 661. Rural loans are made for a variety of purposes, e.g., clearing, fencing, pasture improvement, farm water conservation, erection of essential farm buildings, and the

stocking of properties. Other aspects of assistance granted include aid to successful applicants in government sponsored rural development schemes and land ballots. Special attention is also given to providing finance to applicants opening up new areas. Particulars of rural advances approved in Victoria during the year ended 30th June, 1964 are given in the following table :—

VICTORIA—COMMONWEALTH DEVELOPMENT BANK OF AUSTRALIA : RURAL ADVANCES APPROVED, YEAR ENDED 30TH JUNE, 1964 (\$'000)

Type of Rural Activity	Rural Advances Approved
Sheep	638
Dairying	1,056
Cattle	110
Wheat	135
Fruit Growing	157
Poultry	202
Other	137
Total	2,436

The average loan approved for rural purposes during the year was \$8,858.

Advances by Major Trading Banks

The extent of rural lending in Victoria by the Commonwealth Trading and other major trading banks is illustrated by the following table which shows bank advances to borrowers outstanding at the end of June for the five years 1960 to 1964 :—

VICTORIA—COMMONWEALTH TRADING BANK AND PRIVATE TRADING BANKS : BUSINESS ADVANCES OUTSTANDING TO RURAL INDUSTRY BORROWERS (\$ Mill.)

Industry of Borrower	Amount Outstanding at the End of June—				
	1960	1961	1962	1963	1964
Sheep Grazing	39.7	38.4	39.5	39.8	39.8
Wheat Growing	6.6	4.6	6.3	7.8	8.4
Dairying and Pig Raising	25.9	24.6	27.4	29.7	31.8
Other Rural	16.4	15.9	17.2	19.4	20.2
Total	88.7	83.6	90.3	96.7	100.2

Advances to rural industry borrowers represented 18.7 per cent. of trading banks' business advances outstanding at the end of June, 1964 and 15.1 per cent. of all advances outstanding. The maximum rate of interest on bank overdrafts at 30th June, 1964 was 7 per cent. per annum but the average rate on rural loans would probably be below this level.

Advances of Pastoral Finance Companies

The following table shows total rural advances outstanding to pastoral finance companies at the end of June for the five years 1960 to 1964 :—

VICTORIA—RURAL ADVANCES* OF PASTORAL FINANCE COMPANIES
(\$ Mill.)

At End of June—							Advances Outstanding
1960	..	..	..	..	..	..	35·3
1961	..	..	..	..	..	..	39·9
1962	..	..	..	..	..	..	32·9
1963	..	..	..	..	..	..	35·6
1964	..	..	..	..	..	..	39·0

* Held by branches located in Victoria which is not necessarily the State of residence of the borrower.

Improvement Purchase Leases

Crown land can be made available for application under improvement purchase lease conditions. All applications received are dealt with by a Local Land Board and no person is eligible to obtain a lease if the unimproved value of the area applied for together with the unimproved value of the land already owned by the applicant exceeds \$15,000.

The essential conditions of an improvement purchase lease are as follows :—

- (1) That the lessee will make such land improvements within the first six years as are specified. Land improvements means the clearing, draining or grading of land, the preparation of land for the sowing of crops and pasture, and soil improvement and maintenance.
- (2) That the lessee will commence to carry out the land improvements within one year and will complete one quarter within three years.
- (3) That the lessee will not sell, assign, or part with possession of the leasehold during the first six years.
- (4) That the lessee will not mortgage his interest in the leasehold during the first six years without first obtaining the consent of the Department.
- (5) That the lessee will establish his permanent home on the land before the end of the sixth year. If the land is not considered to be capable of being developed into a living area, then the lessee may reside on other land within 20 miles owned by him.

The purchase money is payable in 20 annual instalments and on satisfactory compliance with the conditions of the lease and on payment of the balance of purchase money and fees, a Crown grant will be issued at any time after the first six years.

Since the inception of improvement purchase leases in 1956 and up to 31st December, 1964, 633 allotments comprising 235,281 acres of Crown land have been proclaimed available for settlement.

Water Supply and Land Settlement

History

For practical purposes, the history of water supply in Victoria—outside the Metropolitan Area—can be taken up in the early 1880's when the miners who had left the goldfields to settle on the northern plains began to realize after a few exceptionally favourable years the true nature of the arid lands which they were pioneering. It was their agitation which led to the *Irrigation Act* 1886 providing for elected local trusts to construct water supply works with Government loan funds.

Between 1886 and 1900, about 90 Trusts were set up under this Act, but for a variety of reasons they all proved a failure. By 1900, the need for a State-wide attack on the water supply problem was apparent and in 1905 the Water Act was passed. This revolutionary Victorian Act, which has since provided the basis for practically all of the rest of Australia's water supply development, had three main features :—

- (1) It abolished all but one of the Trusts and wrote off their debts ;
- (2) it set up the State Rivers and Water Supply Commission to develop and control water supply and conservation throughout the State, with the exception of the Melbourne Metropolitan Area ; and
- (3) it completed the nationalization of water resources commenced in the 1886 Act and vested in the Crown the right to the use and control of the water in the State's rivers, streams, &c., thus avoiding the litigation which has clouded the history of water supply in the U.S.A.

Irrigation

One of the Commission's most important functions is to promote the development of irrigation, and at 30th June, 1964, it had spent about \$164 mill. on this work, or 60 per cent. of its total capital expenditure on water supply and conservation including urban supplies outside the Melbourne Metropolitan Area.

Most irrigation is carried out in districts directly controlled by the Commission, although there is an increasingly large proportion of "private diverters", i.e., irrigators who are authorized to take water from streams, lakes, &c., but who do not come within the boundaries of an irrigation district. (See pages 477-479.)

A feature of the districts is the system of "water rights". Under this system a certain quantity of water is assigned to each district and allotted to the lands suitable for irrigation. The irrigators pay a fixed sum for this water each year, whether they use it or not, and also pay a general rate. The irrigators get this water right in all except the very driest years and they can also buy water in excess of the water right in most seasons.

The water right system assures irrigators of a definite quantity of water each year, and the Commission can rely on fairly constant revenue to meet the cost of district operation. Water usage varies according to seasonal conditions and the water right system provides a constant minimum income.

Another feature of Victorian irrigation policy has been the development of closer settlement by intensive irrigation, that is, by allocating relatively large quantities of water per holding instead of limiting the allocation of water to a portion of each holding. This has meant that Victorian irrigation is predominantly devoted to dairying, fruit, and vegetables, rather than sheep-raising. The advantage of intensive irrigation is that much higher returns are available from a given quantity of water and, consequently, a much greater rural population can be supported.

River Murray water is shared by Victoria equally with New South Wales after certain quantities have been reserved for the use of South Australia. This principle was established after many years of controversy by the River Murray Waters Agreement, which was incorporated in the 1915 River Murray Acts under which a Commission comprising representatives of the three States and the Commonwealth was formed to administer the Agreement. The four parties share equally the cost of all works on the River Murray.

Major storages devoted principally to irrigation are shown in the following table :—

VICTORIA—MAJOR IRRIGATION STORAGES

River	Name	Capacity	Principal System or District Served
		acre ft.	
Goulburn ..	Lake Eildon ..	2,750,000	Goulburn-Loddon
	Goulburn Reservoir ..	20,700	" "
	Waranga Reservoir ..	333,400	" "
Campaspe ..	Lake Eppalock ..	252,860	" "
Loddon ..	Cairn-Curran Reservoir	120,600	" " town supply ; private diverters ; and Goul- burn-Loddon System
	Tullaroop Reservoir ..	60,000	
Murray ..	Lake Hume ..	1,250,000*	Murray
	River Murray Weirs ..	111,420*	"
Macalister ..	Lake Glenmaggie ..	154,300	Macalister
Werribee ..	Pykes Creek Reservoir	19,400	Bacchus Marsh District
	Melton Reservoir ..	15,500	Werribee District
		5,299,410†	

* Victoria's half share under the River Murray Agreement, subject to certain obligations to South Australia.

† In addition to the storages named, the total includes a system of natural lakes in the Kerang-Swan Hill Area. These lakes are part of the Torrumbarry System and have a total capacity of 141,910 acre ft. The Coliban River storages are used for both irrigation and town supply around Bendigo and Castlemaine. A limited irrigation area is also supplied from the Wimmera-Mallee System.

The following table compiled by the Commission shows the total areas of the various irrigation systems and the areas under irrigated culture during 1963-1964 :—

VICTORIA—AREA OF SYSTEMS AND LANDS IRRIGATED, AND WATER DELIVERED, 1963-64

System or District	Total Area within Constituted District	Area Irrigated							Water Deliveries	
		Pastures		Lucerne and Sorghum	Vineyards	Orchards	Market Gardens	Others		Total
		Native	Sown							
Goulburn-Loddon System	1,349,100	17,496	407,744	32,566	acres 409	23,727	3,115	15,745	500,802	acre ft. 693,718
River Murray System—										
Torrumbarry System* ..	359,865	16,790	209,714	9,194	4,339	1,691	730	8,910	251,368	231,837
Murray Valley Area ..	302,041	908	96,400	7,894	42	5,814	287	540	111,885	178,584
Pumped Supply Districts†	80,764	302	601	683	36,976	3,373	171	1,481	43,587	132,305
Total River Murray	742,670	18,000	306,715	17,771	41,357	10,878	1,188	10,931	406,840	542,726
Macalister District ..	130,599	2,705	55,404	794	..	..	8	227	59,138	85,855
Werribee-Bacchus Marsh	16,343	48	5,733	809	..	609	4,349	43	11,591	15,900
Other Northern Systems ..	‡	651	11,296	1,316	..	3,447	462	140	17,312	27,997
Other Southern Systems ..	‡	..	..	..	..	..	1,094	269	1,363	..
Private Diversions ..	‡	2,460	94,254	10,653	3,491	5,230	14,206	9,901	140,195	335,272
Grand Totals ..	\$2,238,712	41,360	881,146	63,909	45,257	43,891	24,422	37,256	1,137,241	1,701,468

* Includes 28,121 acres irrigated by private diversion.

† Including First Mildura Irrigation Trust (15,540 acres irrigated), supervised by the Commission.

‡ Not available.

§ Incomplete.

Works Under Construction and Projected

Due to the enlargement of Lake Eildon and the construction of the Cairn-Curran and Tullaroop Reservoirs and Lake Eppalock, a large scale channel enlargement and remodelling programme in the Goulburn-Murray Irrigation District is in progress. Approximately half of the work has been completed.

Victoria will benefit indirectly from the construction of the Chowilla Dam on the River Murray, six miles downstream of the South Australian border. The reservoir, of a design capacity of 4,600,000 acre ft., will be built under the terms of the River Murray Agreement. The contracting parties to the agreement have arranged with the Government of New South Wales that the Lake Menindee Storages, on the Darling River, shall operate under the control of the River Murray Commission during the construction of the Chowilla Dam. It is anticipated that construction will commence during 1966.

A reservoir of a capacity of 60,000 acre ft. is under construction on Fyans Creek near Halls Gap. This storage, Lake Bellfield, will augment the water supply of the Borough of Ararat and supplement the Commission's Wimmera-Mallee System.

Adjoining Bittern Reservoir on the Mornington Peninsula, a 12,000 acre ft. storage is now in operation on Devilbend Creek. This project functions as a storage reservoir, filled from the Bunyip River headworks, to meet the local peak summer demands of the bayside towns. It has also a valuable role as a drought reserve for the Mornington Peninsula System.

The latter two projects are part of a \$75 mill. long-term programme for the erection of nine storages. The Tarago Reservoir on the Tarago River will be commenced in 1965 and will serve the Mornington Peninsula, whilst the first stage of the Buffalo Dam (capacity 16,000 acre ft.) on the Buffalo River is under construction. This will augment the water supply of the City of Wangaratta and supplement water already supplied to tobacco farms in the area. The second stage is for a reservoir of 800,000 acre ft. capacity, costing approximately \$40 mill., to be started in 1968.

Irrigation, 1962**Wimmera-Mallee Region Water Supply and Flood Protection, River Improvement, and Drainage, 1963****Water Supply in Victoria, 1964****Goulburn-Murray Irrigation District, 1965***Private Irrigation Development*

The extensive programme of water conservation works carried out by the State Rivers and Water Supply Commission in the post-war period has led to a large increase in irrigation development and over the period 1953-54 to 1963-64 the area of land developed to irrigated culture within constituted irrigation districts in Victoria has grown from 731,400 acres to more than 968,000 acres.

The growth in private irrigation development over this period has been even more marked and the area irrigated by the private diversion

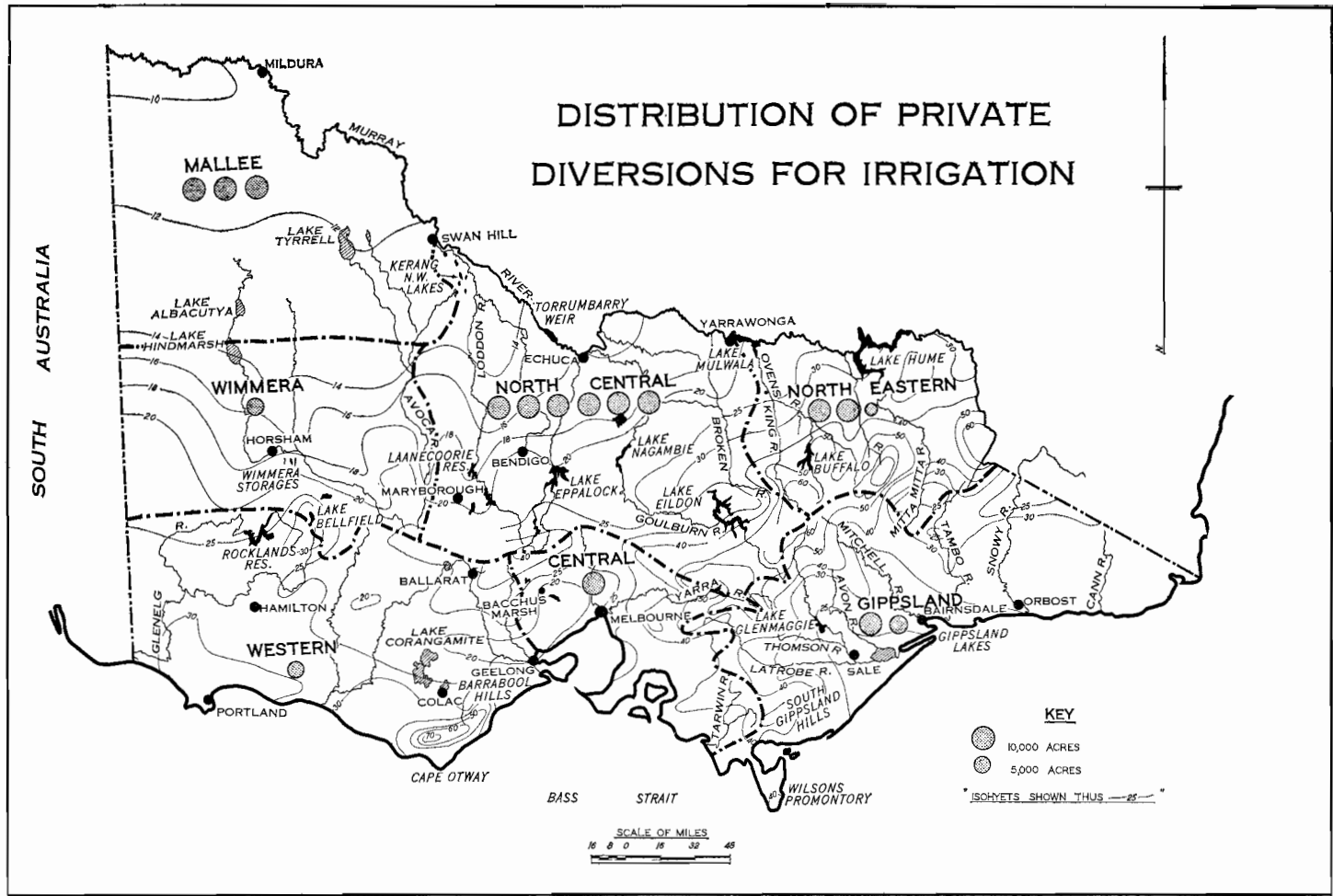


FIGURE 12.

of water from streams and other natural sources of supply within the State has increased from 89,607 acres in 1953-54 to over 168,000 acres in 1963-64. Approximately 75 per cent. of this acreage comprises annual and perennial pastures and fodder crops, and the balance is developed to a variety of high return crops, including potatoes, tobacco, hops, citrus, and cotton.

Some 82,000 acres of the total area under private irrigation are supplied from rivers in which the summer flow has been assured by the construction of major storages, but the remaining area, of approximately 86,000 acres, is irrigated from streams in which the summer flow is dependent upon rainfall.

Development is not confined to the low rainfall areas in the northern portion of the State, but is spread throughout Victoria. A significant proportion of the new development in recent years has taken place in the higher rainfall zones in southern Victoria and in Gippsland, where spray irrigation is used to supply any deficiencies in natural rainfall during the summer and autumn months.

The increasing usage of water for irrigation creates problems during the summer months and in a dry season it may be necessary for the State Rivers and Water Supply Commission to prohibit the taking of water from some streams, or to roster pumping times, in order to safeguard supplies for township requirements and domestic and stock needs along the stream. Wherever possible, the co-operation of local water users is sought in the administration of diversions and the introduction of restrictions on pumping, by the formation of Advisory Committees comprising representatives of the various classes of water users along the stream.

The loss of farm income resulting from the prohibition or restriction of the use of water for irrigation in a dry year can be substantial and there is a growing awareness by landholders of the merits of water conservation. In many areas the usage of water by private diverters severely taxes the flow of streams during the summer months and any expansion of irrigation is dependent upon the construction of private storages by individual landowners to conserve surplus flows during the winter or spring for use to supplement the natural flow of the stream during the drier months.

Many private storage dams are being constructed on individual properties each year, frequently involving a large capital outlay by the landowner. The extent to which development proceeds on these lines will ultimately be the limiting factor in determining the degree to which private irrigation development may expand.

Underground Water, 1964

Spray Irrigation in Agriculture and Dairying, 1965

Water Research Foundation

The Water Research Foundation is an organization formed to initiate, promote, and further scientific and technological research into the development, control, and use of water in Australia. The Victorian State Committee, which was formed in 1959, includes representatives of authorities in the various fields of science, engineering, primary production, and commerce. This Committee co-ordinates the work of the Foundation in Victoria and initiates and supervises research projects carried out in the State.

Current research projects being carried out by the Foundation in Victoria include research into aspects of water use, storage, distribution, and purification. These projects are initiated and financed by the Foundation and the actual research work is conducted both in the field and in the laboratories of various research establishments.

An investigation is being made of catchments used for domestic water supplies in forest areas in southern Victoria. The effect of various types of forest cover and of logging operations is being examined in order to establish criteria for various types of catchments. Other current projects include research into water retention in small earth dams, reclamation of waste waters, the relationship between storm rainfall and run-off, the hydraulics of surface irrigation, and flow through porous media. These projects, and many others being carried out elsewhere in the Commonwealth, have been selected in order to ensure the best possible use of Australia's very limited water resources.

The Victorian State Committee also holds symposia to enable all interested parties to consider and discuss various problems associated with the use of water. Finance for the Foundation's work is provided by public subscription and by grants from various public authorities. A substantial grant is made to the Foundation each year by the Victorian Government.

Agricultural Education, Research, and Extension

Tertiary Agricultural Education

Historical Background

Australian farming has a history of steady development, the pace of which has accelerated greatly in recent years. Some of the early pioneers were well-educated farmers who had been connected with estates in Britain. Others were labourers who had little or no schooling. Later came the diggers among whom were numbers of men with trained minds seeking adventure. When the diggings failed, many endeavoured to become farmers.

In those early days farming required little more than strong muscles and a knowledge of how to deal with farm animals. Cultivation was largely a matter of horse management; harvesting by stripper and winnower did not require much mechanical skill. The lore of the sheep flocks was most essential. Simple crafts were helpful in the erection of the buildings and fences. Schooling was an advantage in dealing with traders either for selling the produce or buying the necessities; but the bare essentials were sufficient.

By the end of the century, great advances had been made. Harvesters were coming in; the more complicated stump-jump implements were normally in use; superphosphate was gradually coming into favour; new varieties of wheat were available; and dairying with its separators and recognition of the need for general cleanliness was spreading. Sheep husbandry had become much more complex. Some basic training for agriculture was becoming essential. Parallel developments were taking place in other countries and especially in U.S.A. where land settlement schemes were also concerned with the lack of farm experience.

The Agricultural Colleges in Victoria, as in other States of the Commonwealth, had their beginning in the passing of the various Land Acts of the late 1860's and early 1870's. These Acts gave a stimulus to land settlement and a transition from the broad acres of the pastoralist to arable farming on smaller areas. Very soon the early settlers were in trouble. In 1877, Victoria was still importing wheat. During that year a deputation waited on the Minister of Agriculture and Chief Secretary of the day to ask for the establishment of agricultural colleges. The report of the deputation reveals that emphasis was placed on soil chemistry, veterinary surgery, and practical farming: soil chemistry because of the so-called exhausted soil, veterinary surgery because the animal still played the largest part in the State's economy, and practical farming because of the difficulties being experienced by the settlers.

In 1884, the first Agricultural Colleges' Act was passed providing for the establishment of agricultural colleges in Victoria. Dookie Agricultural College was opened in 1886 and Longerenong Agricultural College in 1889. Their objective was to train farmers. The State Education Department was also empowered to establish Agricultural High Schools, each with a small farm.

Meanwhile the Agricultural Department which had originally been a regulatory body set out to establish experimental research farms on which it would be practicable to test varieties of cereals and fertilizers and to study the problems of animal husbandry. Test plots were established on commercial farms in many districts. The diseases of plants and animals and insect pests were also studied.

In this way a volume of new knowledge of the various obstacles of particular relevance to the local conditions was gradually accumulated. Much of this was technical in character and required well trained officers for its dissemination. The State, therefore, passed a special Act in 1919 to enlarge the School of Agriculture in the University of Melbourne. This Act provided money for a building and for an annual expenditure; it also gave Ministers in charge of certain Departments the right to appoint, at a fixed salary, a limited number of the graduates as officers, without reference to the Public Service Commissioner.

Agricultural Colleges

The legislation of 1884 which provided for the establishment of agricultural colleges set up a Council of Agricultural Education for their administration. Its revenue was derived from the rentals of endowment lands, sales of farm produce, and students' fees, and it continued to administer the Colleges until 1944 when, with the passing of a new Agricultural Colleges' Act, control passed to the Department of Agriculture in which a new Division of Agricultural Education was established. This move has provided adequate finance for maintenance and capital expenditure, the latter including a complete rehabilitation programme for both colleges in the four year period 1959 to 1963.

There are large farm areas attached to each College—6,048 acres at Dookie and 2,386 acres at Longerenong—on which the students are given practical instruction in the growing of crops and pastures, in general farm practice, crafts, and animal husbandry. Practical work is interspersed with formal teaching in the classroom and laboratory.

This course is full-time of three years duration. It affords the student a very good general education which fits him either for practical farming as a career, or for employment as a technologist in Government or semi-government organizations or in firms concerned with the handling of farm produce or the supply of farmers' requisites, such as fertilizers and tractors and farm machinery. The demand for agricultural technologists is very great.

The Department of Agriculture is also responsible for administering the College of Horticulture at Burnley Gardens. In 1958 the Certificate of Competency in Horticulture was upgraded to a three years' diploma course. Standards for admission to the agricultural colleges and the standard of the curriculum have been progressively raised. The Agriculture Education Division of the Department also provides short intensive courses for farmers' sons and others engaged in rural pursuits at Dookie Agricultural College and administers the Government grant to Senior Young Farmers.

University of Melbourne School of Agriculture

Although the University of Melbourne was founded in 1853, it was not until 1905 that a degree course of Bachelor of Agricultural Science was established. The subsequent appointment of a Professor of Agriculture was a temporary position only, and most courses were taken in other Departments.

With the passing of the Agricultural Education Act in 1919 providing for the establishment of a Faculty of Agriculture, a building for the School of Agriculture, and provision for the employment of graduates in the Public Service of Victoria, students were attracted in larger numbers and permanent staff were appointed. With the appointment of the first permanent full-time Professor in 1926, a well-defined policy for the training of agricultural scientists in Victoria emerged and the graduates from the School provided the basic staff for a number of scientific appointments in the State Departments.

The primary purpose of the four-year University course has been to give all students a common, broad basic training in applied biology. The undergraduate course is based on a first year devoted to pure science subjects. This is followed by three years in which the scientific principles, upon which agriculture is based, are presented and in which students learn of their application to the practice of agriculture.

A feature of the Melbourne course has been the year in residence during the second year of the course, originally at the State Research Farm, Werribee, later at Dookie Agricultural College, and now at the University's own Field Station at Mount Derrimut. Although the primary purpose of this year has been to provide for close contact with farm operations, it has also afforded the opportunity for communal life with its consequent benefits. In 1963 the University leased, for an extended period, a property of some 800 acres, portion of the original Mount Derrimut Station at Deer Park, some 12 miles from the School. This is now used as a Field Station and as a residential college for the second year students. With funds provided from industry research trusts, research units in beef cattle, sheep and wool, and wheat are being built.

The undergraduate course itself covers a wide field. Thus, on completion of the course, the students have a sound basic knowledge of the following facets of agriculture :—

- (1) The structure and growth of plants in general and agricultural crops and pastures in particular, their method of absorption of nutrients and elaboration of plant constituents ;
- (2) the structure of soils, their classification and development and the main minerals, organic matter, and nutrients available in them, and the microflora that grow in soils ;
- (3) the physiology and reproduction of farm animals, their digestion and utilization of foodstuffs ;
- (4) economic studies of farm management and marketing of agricultural products ; and
- (5) sociological studies of the farmer and his family, and the extension methods used by advisory officers in conveying research findings to the farmer.

Since the establishment of the Faculty of Agriculture, 788 graduates have entered the profession. The number of applicants for places in the School has been greater than can be accommodated in recent years and a quota of 70 is placed on the numbers in First Year of the course. The number of graduates is now between 40 and 50 per annum.

During the earlier years of its establishment, agricultural engineering was an integral part of the Faculty of Agriculture. More recently, it was decided that the more appropriate location for this section was with the Faculty of Engineering. A full-time degree course in Agricultural Engineering is now given at the University, but Agricultural Science undergraduates receive lectures in farm mechanics, surveying, hydraulics, and irrigation.

With the provision of increased finance by State and Commonwealth Governments it has been possible in recent years to improve materially the accommodation and facilities at the School of Agriculture. Financial assistance has also been forthcoming from various bodies such as the Rural Credits Development Fund of the Reserve Bank and a number of primary producer research trusts and other bodies. These have been of particular value in strengthening the research and post-graduate training at the School.

The following table shows the number of qualifications awarded by various agricultural institutions since their inception and the number of students enrolled in 1964 :—

VICTORIA—AGRICULTURAL COLLEGES : NUMBER OF QUALIFICATIONS AWARDED AND THE NUMBER OF STUDENTS ENROLLED IN 1964

Institution	No. of Diplomas Awarded*	No. of Certificates Awarded†	No. of Students Enrolled in 1964
Burnley Horticultural College ..	61	..	64
Dookie Agricultural College ..	1,624	12	200
Longerenong Agricultural College ..	442	570	104

* Number of Diplomas include those awarded in March, 1965.

† From 1907 to 1947 Longerenong conducted a two years' course only for which a Certificate was awarded. Some of these students transferred to Dookie for the final Diploma.

Survey of Education and Training for Agriculture

The increased emphasis on the scientific and commercial aspects of farming during the last two decades has led to a greater appreciation of the range and complexity of education and training required for effective agricultural development. The Australian Council for Educational Research conducted a survey into the nature of education and training at present given in Australia to those engaged or likely to be engaged in agricultural work. It will set the results of this survey against an assessment of needs and arrive at recommendations for expansion, modification and change.

Marcus Oldham Farm

The College was founded in 1961 under the Will of the late Marcus William Oldham with the aim of providing, in Australia, training in the principles and practice of farm business management. It provides training for young men who intend to go on the land in a managerial capacity.

An applicant is required to have at least one year's practical experience before he can be accepted for the two year course. A further three months' practical period is spent on an approved property between the two academic years. The emphasis of the course is on sheep and beef cattle production, with associated cropping. Farm Management is the key subject towards which all the other subjects lead. Some of the subjects taught are animal production, pasture production, production economics, agricultural economics, farm book-keeping, farm machinery, wool classing, soil science, and estate planning and taxation.

The College farm is a commercial unit run by a permanent staff on which the principles taught are demonstrated in practice.

The College started with fourteen students in 1962, and in 1965 reached the maximum capacity of 68 students. Students come from all States of Australia and overseas. Selection for entry is based on a system in which points are allotted for age, academic standard, and years of practical experience.

Weekly excursions are held to neighbouring properties to illustrate particular points of husbandry and management, and once a year all students go on an extended farm tour of a particular region of Australia. In general, the course concentrates on depth of teaching rather than breadth; thus, no training is given in dairying, poultry raising, or horticulture.

The College runs short courses for farmers and other groups who request them. It also provides a Farm Management Consulting Service and Beef Cattle Advisory Service.

Research and Extension*Victorian Department of Agriculture*

The high standard of Victoria's agriculture, which produces more than one-quarter of Australia's primary produce (measured in terms of value) from less than one-thirtieth of the nation's area, is due in no small measure to the programme of research and advisory services undertaken by the Victorian Department of Agriculture.

The Department of Agriculture, which has expanded greatly in recent years, has concentrated on strengthening its existing research stations with new and up-to-date facilities, establishing new research centres, promoting new research projects, and intensifying advisory services.

At research centres strategically located in Victoria's rural areas, highly trained scientists are seeking the answers to a wide range of problems which face the primary producer trying to improve the efficiency of his farm. These scientists have already made many notable discoveries which have benefited Victorian agriculture.

To speed these research results to the farming community, the Department of Agriculture has appointed trained advisory officers throughout rural Victoria.

These advisory officers use every method of communication to channel technical facts to farmers. Much of their time is taken up with on-the-farm advice, but they also speak at field days and hold discussion group meetings. Their work is also backed by the Department of Agriculture's intensified production of publications, films, and radio and television services.

Bureau of Agricultural Economics Activities in Victoria

The Bureau of Agricultural Economics was established in August, 1945, in order to meet the need for a Commonwealth research body in the field of agricultural economics and rural policy. No administrative functions are vested in the Bureau; it is specifically a service institution charged with the duty of undertaking research and making the results available to all concerned, including Commonwealth and State Departments, semi-government and private institutions, and individuals.

As a Commonwealth body, the Bureau is concerned with agricultural problems and policies primarily on a Commonwealth wide basis. Its activities in the States are to a large extent limited to collecting basic information for this purpose. It does, however, carry out specific investigations requested by State authorities. In Victoria these have included a study of the water requirements in relation to irrigated dairy farms and fat lamb farms in the Tongala-Stanhope Irrigation District; an examination of the economic aspects of the processed tomato industry; and an economic assessment of the mechanical harvesting of tobacco.

Generally, the activities of the Bureau in Victoria have taken the form of surveys of the structure of the various rural industries. These have been usually carried out in conjunction with the Victorian Department of Agriculture. The most important of these include:—

- (1) A study of the costs, incomes, and management problems of dairy farms in Victoria. This study, carried out in conjunction with the State Department and with the assistance of the Victorian Dairy Farmers' Association, covered commercial butter producers in the main dairying districts.

- (2) Four surveys of the economic structure of the wheat industry in Australia have been undertaken since 1945. Data on all aspects of farm activity in the main wheat growing districts of Victoria and other States were collected and analysed, the latest survey being in respect of the three seasons ending 1961-62.
- (3) The economic structure of the Victorian sheep industry is being undertaken as part of the Bureau's Survey of the Australian Sheep Industry. This survey covers every season from 1952-53 to 1962-63 and consists of a representative sample of sheep properties carrying 200 sheep or more. For Victoria, the survey distinguishes properties into two zones: the wheat/sheep and high-rainfall. At present a study is in progress of the economics of sheep management in the Hamilton area of the Western District. The study is designed to investigate the profitability of different Farm Management practices in this area and has already indicated the predominant influence of the level of stocking in net farm income and returns on capital investment. This survey includes 28 farms and covers the six year period from 1957-58 to 1962-63. A study of the fat lamb industry in Victoria was undertaken by the Bureau as part of a wider study to obtain details of costs in fat-lamb producing properties for the 1949-50 season.
- (4) (a) A survey of the Australian dried fruits industry carried out in conjunction with the State Departments of Agriculture in New South Wales, Victoria, and South Australia. The areas in Victoria covered include the Robinvale district, the Mid-Murray district, and the Sunraysia District; and
- (b) A further survey covering the same districts, in respect of the three seasons ending 1962-63, was carried out to provide basic information for the establishment of a stabilization scheme requested by the industry;
- (c) A continuous study of a sample group of dried vine fruit specialists in Sunraysia;
- (d) A study of the economics of artificial rack drying of vine fruits.

Other surveys carried out by the Bureau which have included Victoria as an area of study include surveys of the following industries:—commercial egg production, wine grapes, beef cattle, canning fruits, berry fruits, citrus, and a study of water diversion by private pumping from the Lower Murray River.

Other activities of the Bureau which are of importance for Victoria include the publication of various commodity situation reports such as "The Wheat Situation", "The Wool Outlook", and "The Dairy Situation", which review home and oversea developments affecting the outlook for these major commodities and the publication from time to time of special reports such as the "Statistical Handbook of the Sheep and Wool Industry" and "Changes in Acreage and Production of Wheat in Australia". The Bureau also carries out more general analyses which are of interest to Victoria as well as other States. These include examinations of the effects of economic policies, conditions and developments at home and abroad on Australian rural industries, of trends in Australian farm production, cost and incomes, and of the economics of rural development projects.

Further Reference, 1961

Farming

Introduction

Collection of Statistics

Since the year 1904, police officers have been required to collect agricultural, pastoral, and dairying statistics from land holders in Victoria. Prior to 1904, the statistics were collected by the municipal authorities who were required by statute to furnish information on such forms and in such manner as was required by the Governor in Council.

The rural statistics contained in this chapter are in the main compiled from annual returns of agricultural, pastoral, and dairying production collected from some 70,000 rural holdings in Victoria at 31st March each year. Schedules are distributed to farmers by about 320 local police officers who act as collectors of statistics. Statistics from these schedules are compiled for each county and municipality.

Every holding of 1 acre and upwards used for the production of agricultural products or for the raising of livestock and the production of livestock products is visited, and full particulars are obtained of the area occupied, the rural population, the number of persons employed, the area and yield of each kind of crop cultivated, artificial fertilizer usage, numbers of certain items of farm machinery, the number and description of livestock, and the quantity of wool clipped.

Data relating to area sown, production, yield per acre, and number of holdings growing crops are for the season ended 31st March, thus including crops which are sown and harvested, or harvested, during the twelve months ended 31st March.

In cases where harvesting of certain crops has not been completed by the 31st March (potatoes, fruit, vines, &c.), supplementary collections are made later in the year.

Livestock numbers, farm machinery on rural holdings, and the number of persons working are reported at 31st March, whilst wage and salary payments relate to the twelve months ended 31st March.

Summary of Australian Statistics

The following table, which summarizes the principal farming activities in Australia during the 1963-64 season, shows the position of farming in Victoria relative to other States :—

AUSTRALIA—PRINCIPAL ITEMS OF FARM ACTIVITY,
1963-64

Particulars	N.S.W.	Vic.	Qld.	S.A.	W.A.	Tas.	N.T. and A.C.T.	Australia
Rural Holdings—								
Number	77,339	69,775	43,181	28,711	22,770	10,949	513	253,238
Area ('000 acres)	172,076	37,798	376,687	158,905	266,556	6,377	166,107	1,184,506
Principal Crops—								
Wheat—								
Area ('000 acres)	4,964	3,109	938	2,802	4,640	18	3	16,474
Production ('000 bush.)	122,472	76,302	22,274	53,971	52,340	483	69	327,912
Oats—								
Area ('000 acres)	794	910	31	501	1,125	30	1	3,392
Production ('000 bush.)	19,812	19,885	673	9,149	17,850	844	22	68,234
Barley—								
Area ('000 acres)	212	190	176	1,123	300	14	..	2,014
Production ('000 bush.)	5,351	4,026	5,191	24,337	4,077	414	..	43,395
Hay—All Types—								
Area ('000 acres)	584	1,138	80	358	289	150	4	2,602
Production ('000 tons)	1,006	1,947	184	488	389	249	5	4,269
Tobacco—								
Area (acres)	2,927	10,519	15,579	..	..	..	..	29,025
Production (dried leaf '000 lb.)	2,652	14,459	17,231	..	..	..	..	34,342
Onions—								
Area (acres)	682	3,756	3,317	930	446	91	*	9,222†
Production (tons)	4,998	17,946	20,412	8,736	6,814	372	*	59,278†
Potatoes—								
Area (acres)	24,331	39,626	15,886	5,459	5,835	10,806	23	101,966
Production (tons)	98,019	200,384	90,201	51,195	55,402	66,420	122	561,743
Other Vegetables—Area (acres)	41,011	41,368	44,825	10,124	7,965	19,554	243	165,090
Fruit—Area (acres)	98,670	76,796	44,681	41,686	25,670	22,134	203	309,840
Vineyards—Area (acres)	18,715	46,501	3,276	58,679	8,629	..	..	135,800
Grapes for Table (tons)	7,012	8,216	3,925	969	2,367	..	..	22,489
Wine Made ('000 gall.)	6,030	3,705	33	27,189	949	..	..	37,906
Currants (tons)	728	3,934	..	4,508	2,166	..	..	11,336
Sultanas and Raisins (tons)	12,456	66,138	..	12,989	121	..	..	91,704
Livestock Numbers, 31st March, 1964—								
Sheep ('000)	71,764	28,413	24,337	16,403	20,165	3,600	298	164,980
Cattle ('000)	4,789	3,301	7,402	694	1,299	450	1,069	19,005
Pigs ('000)	391	322	388	153	128	83	2	1,468
Livestock Slaughtered for Human Consumption—								
Sheep ('000)	5,991	7,287	2,045	1,568	1,279	545	62	18,775
Lambs ('000)	5,943	5,341	363	1,428	858	582	56	14,571
Cattle ('000)	1,369	1,111	1,455	190	339	122	62	4,648
Calves ('000)	561	648	401	89	34	54	2	1,790
Pigs ('000)	636	531	606	214	185	124	9	2,305
Wool Production ('000 lb.)	731,316	334,288	255,386	210,500	216,574	34,007	2,643	1,784,714
Whole Milk Production—								
All Purposes ('000 gall.)	322,547	689,881	239,827	97,523	57,162	83,124	1,222	1,491,286
Principal Items of Machinery on Rural Holdings—								
Tractors (No.)	76,166	71,405	60,749	33,231	30,879	10,904	414	283,748
Shearing Machines (Stands)	68,859	39,433	18,950	28,149	20,293	4,371	315	180,370
Milking Machines (Units)	42,970	98,151	45,072	19,057	10,157	13,382	83	228,872
Gross Value of Production ‡—								
Agriculture (\$'000)	330,834	272,807	294,434	165,796	123,302	41,198	484	1,228,855
Pastoral (\$'000)	583,268	382,211	280,680	150,466	148,702	32,844	10,384	1,588,555
Dairying (\$'000)	142,546	172,560	70,274	34,430	20,296	23,472	522	464,100

* Not available for publication.

† Incomplete.

‡ Subject to revision.



FIGURE 13. Counties and Statistical Districts of Victoria.

Land Occupied in Different Districts, 1963-64

For the season 1963-64, the number of occupiers of rural holdings was 69,775, the area devoted to agriculture 7,424,420 acres, and the total area occupied 37,797,550 acres.

It should be noted that statistics in this part of the Year Book have been compiled for Statistical Districts, which are groups of counties, namely, land areas with immutable boundaries. A map defining the boundary of each Statistical District appears on the previous page.

**VICTORIA—LAND IN OCCUPATION IN EACH DISTRICT,
SEASON 1963-64**
(Areas of 1 acre and upwards)

Statistical District	Total Area of Districts (Acres)	Number of Holdings	Acres Occupied				Total
			For Agricultural Purposes*	For Pasture		Unproductive	
				Sown Grasses, Clover, or Lucerne†	Natural Grasses		
	'000						
Central ..	4,065	14,478	293	1,449	699	222	2,663
North-Central ..	2,930	4,403	111	719	1,108	135	2,073
Western ..	8,775	12,801	406	4,334	1,487	389	6,617
Wimmera ..	7,395	6,087	2,063	1,915	1,663	391	6,032
Mallee ..	10,784	6,150	3,099	1,067	2,698	685	7,549
Northern ..	6,337	11,811	1,238	1,898	2,278	139	5,552
North-Eastern ..	7,220	5,028	126	1,208	1,870	521	3,726
Gippsland ..	8,739	9,017	87	1,473	1,245	780	3,585
Total ..	56,246	69,775	7,424	14,064	13,047	3,262	37,798
PERCENTAGE OF ABOVE TO AREA OCCUPIED							
Central ..	..	..	11.00	54.41	26.25	8.34	100.00
North-Central ..	..	..	5.35	34.69	53.45	6.51	100.00
Western ..	..	..	6.14	65.51	22.47	5.88	100.00
Wimmera ..	..	..	34.20	31.75	27.57	6.48	100.00
Mallee ..	..	..	41.05	14.13	35.74	9.08	100.00
Northern ..	..	..	22.30	34.18	41.02	2.50	100.00
North-Eastern ..	..	..	3.41	32.42	50.19	13.98	100.00
Gippsland ..	..	..	2.42	41.09	34.73	21.76	100.00
Total ..	..	..	19.64	37.21	34.52	8.63	100.00
PERCENTAGE IN EACH DISTRICT OF TOTAL IN STATE							
Central ..	7.23	20.75	3.95	10.30	5.36	6.81	7.05
North-Central ..	5.21	6.31	1.50	5.11	8.49	4.14	5.48
Western ..	15.60	18.35	5.47	30.82	11.40	11.92	17.51
Wimmera ..	13.14	8.72	27.79	13.62	12.74	11.99	15.96
Mallee ..	19.17	8.81	41.74	7.59	20.68	21.00	19.97
Northern ..	11.27	16.93	16.67	13.50	17.46	4.26	14.69
North-Eastern ..	12.84	7.21	1.71	8.59	14.33	15.97	9.86
Gippsland ..	15.54	12.92	1.17	10.47	9.54	23.91	9.48
Total ..	100.00	100.00	100.00	100.00	100.00	100.00	100.00

* Excludes area of clover and grasses cut for hay and seed.

† Includes oats and barley sown for grazing and lucerne fed off.

Classification of Rural Holdings by Size and Type of Activity

Tabulations classifying rural holdings by principal characteristics have, in the past, been undertaken at irregular intervals. Since the Second World War they have been prepared for each of the years

1947-48, 1949-50, 1955-56, and 1959-60. The first detailed classification of holdings by principal type of activity was carried out in conjunction with the size classification of rural holdings 1959-60. The following tables show some of the information, in summary form, from the 1959-60 classification of rural holdings by size and type of activity :—

VICTORIA—HOLDINGS CLASSIFIED ACCORDING TO SIZE OF HOLDING : NUMBER AND TOTAL AREA OF HOLDINGS AND AREA USED FOR VARIOUS PURPOSES, 1959-60

Size of Holding	Number of Holdings	Total Area of Holdings	Area Used For—				
			Fruit	Crops (Excluding Fruit)	Fallow	Sown Grasses and Clovers	Balance of Holding
acres			acres				
1- 99 ..	21,803	841,772	86,184	124,963	11,042	290,300	329,283
100- 199 ..	12,374	1,750,203	10,890	256,687	25,417	824,264	632,945
200- 299 ..	6,499	1,569,717	4,053	185,773	30,833	661,140	687,918
300- 399 ..	5,263	1,780,143	3,445	217,143	55,612	638,202	865,741
400- 499 ..	3,423	1,523,243	1,374	181,096	63,511	519,584	757,678
500- 999 ..	11,287	7,931,505	3,744	1,165,916	571,239	2,249,580	3,941,026
1,000-1,399 ..	3,737	4,409,447	869	727,701	405,757	1,038,161	2,236,959
1,400-1,999 ..	2,477	4,081,603	2,184	606,537	346,348	966,320	2,160,214
2,000-2,999 ..	1,515	3,635,339	1,771	517,383	314,369	811,277	1,990,539
3,000-4,999 ..	888	3,292,668	169	393,508	242,314	656,082	2,000,595
5,000 and over ..	512	6,920,890	1,438	199,910	113,824	752,141	5,853,577
Total ..	69,778	37,736,530	116,121	4,576,617	2,180,266	9,407,051	21,456,475

VICTORIA—NUMBER OF HOLDINGS GROWING WHEAT, AND NUMBER OF HOLDINGS ON WHICH LIVESTOCK WERE DEPASTURED, CLASSIFIED ACCORDING TO SIZE OF HOLDING, 1959-60

Size of Holding	Holdings With—				
	Wheat	Sheep	Dairy Cattle	Beef Cattle	Pigs
acres	No.				
1- 99 ..	191	2,865	11,071	2,271	2,510
100- 199 ..	302	4,027	9,842	2,362	2,670
200- 299 ..	442	3,490	4,782	2,006	1,323
300- 399 ..	819	3,709	3,537	2,051	987
400- 499 ..	743	2,747	2,267	1,533	523
500- 999 ..	4,380	10,144	7,436	5,382	1,412
1,000-1,399 ..	1,914	3,521	2,464	1,830	439
1,400-1,999 ..	1,302	2,383	1,574	1,243	254
2,000-2,999 ..	845	1,477	} 1,662 {	780	} 291
3,000-4,999 ..	501	858		457	
5,000 and over ..	196	470		343		60
Total ..	11,635	35,691	44,956	20,258	10,469

VICTORIA—HOLDINGS CLASSIFIED ACCORDING TO TYPE OF ACTIVITY : NUMBER AND TOTAL AREA OF HOLDINGS AND AREA USED FOR VARIOUS PURPOSES, 1959-60

Type of Activity	Number of Holdings	Total Area of Holdings	Area Used for—				
			Fruit	Crops (Excluding Fruit)	Fallow	Sown Grasses and Clovers	Balance of Holding
			acres				
Sheep—Cereal Grain ..	6,092	8,334,036	857	1,959,402	1,127,595	1,039,230	4,206,952
Sheep ..	16,622	16,546,417	996	735,512	223,135	5,383,597	10,203,177
Cereal Grain ..	2,370	2,496,198	74	966,888	598,859	82,153	848,224
Beef Cattle ..	1,887	2,462,716	174	46,235	9,862	359,760	2,046,685
Dairying ..	20,097	4,190,352	2,324	509,283	52,149	1,904,901	1,721,695
Vineyards ..	2,159	77,960	45,176	1,493	1,410	2,593	27,288
Fruit (Other than Vine) ..	2,109	154,894	53,719	4,688	1,990	18,887	75,610
Vegetables—							
Potatoes ..	1,030	156,331	130	49,977	4,866	44,673	56,685
Other and Mixed ..	1,688	145,125	3,632	43,662	5,249	33,121	59,461
Poultry ..	1,333	97,854	943	10,116	5,651	16,009	65,135
Pigs ..	246	28,040	109	1,925	1,434	5,703	18,869
Tobacco ..	212	29,626	81	7,281	71	6,421	15,772
Other ..	486	51,187	448	14,230	2,655	9,969	23,885
Multi-Purpose ..	2,139	1,271,362	2,267	191,875	71,117	304,046	702,057
Total Classified Holdings	58,470	36,042,098	110,930	4,542,567	2,106,043	9,211,063	20,071,495
Unclassified Holdings—							
Sub-Commercial ..	6,821	656,874	1,069	19,664	31,040	89,804	515,297
Unused, Special, &c. ..	4,487	1,037,558	4,122	14,386	43,183	106,184	869,683
Total All Holdings	69,778	37,736,530	116,121	4,576,617	2,180,266	9,407,051	21,456,475

Artificial Fertilizers

Fertilizers have played a major role in the development of Australian agriculture in recent years. Superphosphate, which was first used in Australia early this century, lifted production in wheat areas dramatically and later allowed the establishment of clover pastures. More recently, research has shown that increased yields of pastures can be achieved by the use of elements such as molybdenum, potassium, copper, and zinc.

The main elements which can be added to soils by the use of fertilizers are phosphorus, potassium, and nitrogen. There are also various trace elements.

Most of Australia, including Victoria, is deficient in phosphorus. Irrespective of how the soil was formed, the story is much the same—a natural supply of 200 parts per million in the surface soil with less in the sub-soil. Notable exceptions include the Darling Downs area of Queensland and small areas of volcanic soil in the Victorian Western District. The addition of one cwt. of superphosphate, which contains 11 lb. of elemental phosphorus, is equivalent to the amount of phosphorus removed from the area by the sale of 27 prime lambs or 75 bushels of wheat.

Soil reserves of potassium are adequate in the drier wheat areas. However, in the wetter areas where leaching has taken place, deficiencies occur. This particularly applies to sandy soils. Clovers are generally the first plants to show visible symptoms of potassium deficiency and this often shows first in the outer paddocks of dairy farms or in paddocks continually cut for hay.

Very little nitrogen fertilizer is applied to crops other than high value crops such as fruit and vegetables. The less intensive agricultural pursuits rely on the fixation of atmospheric nitrogen by the nitrogen fixing bacteria associated with leguminous plants.

The significance of trace elements has become more apparent in recent years following the development of more refined experimental techniques. Some of the more important of these elements include molybdenum and copper.

Experiments have shown that substantial increases in clover growth can be obtained by spreading two ounces of molybdenum an acre in superphosphate, particularly in the high land of the Dividing Range. Recent work has shown that this application may have to be repeated after five to seven years.

Copper deficiencies are common in Victoria on the sandy podsollic soils, particularly in the coastal areas.

In 1963-64 artificial fertilizers were used on 3,068,008 acres of wheat; 1,078,738 acres of other cereal crops; 75,843 acres of vegetables; 83,250 acres of orchards; 172,523 acres of other crops; and 10,524,714 acres of pastures. Superphosphate is the main fertilizer used on both crops and pastures and in 1963-64 amounted to 182,177 tons or 81 per cent. of the total artificial fertilizer used on all crops and 561,832 tons or 94.5 per cent. of that used on pastures.

A summary of the area fertilized, quantity used, and number of holdings on which artificial fertilizers were used is shown below for each of the years 1959-60 to 1963-64 :—

VICTORIA—ARTIFICIAL FERTILIZERS

Year	Crops			Pastures		
	No. of Holdings	Area Fertilized	Quantity Used	No. of Holdings	Area Fertilized	Quantity Used
		'000 acres	'000 tons		'000 acres	'000 tons
1959-60 ..	40,460	4,079	217	38,327	9,153	523
1960-61 ..	31,774	4,129	199	40,561	9,408	546
1961-62 ..	32,965	4,193	211	40,166	9,661	567
1962-63 ..	32,028	4,530	227	40,144	9,940	596
1963-64 ..	31,224	4,478	225	39,531	10,525	656

Aerial Agriculture

The aerial agriculture industry in Victoria has grown rapidly and aircraft are now extensively used for topdressing and seeding, crop spraying with weedicides and insecticides, and the control of rabbits by the dropping of poisoned carrot baits. A more recent phase of aerial agriculture is the dropping of young fish into Victorian lakes and streams. A full description of aerial agriculture will be found on pages 764-765.

Since 1956-57, statistical information has been collected by the Department of Civil Aviation and details for each of the years 1959-60 to 1963-64 are shown in the following table :—

VICTORIA—AERIAL AGRICULTURE

Particulars	Unit	Year Ended 31st March—				
		1960	1961	1962	1963	1964
Total Area Treated						
* †	acres	616,531	806,592	972,269	923,776	1,512,819
Topdressed or Seeded	acres	372,597	580,169	676,219	659,975	1,165,183
Sprayed or Dusted	acres	134,561	196,297	231,098	206,711	281,331
Materials Used—						
Superphosphate ..	cwt.	459,520	749,020	877,200	888,060	1,427,640
Seed	lb.	24,000	1,624	5,135	2,128	39,190
Aircraft Utilization (Flying Time) ..	hours	6,622	9,598	8,545	8,238	11,190

* Areas treated with more than one type of material in one operation are counted once only.
 † Includes 109,373 acres baited for rabbit destruction in 1960, 29,981 acres in 1961, 64,952 acres in 1962, 57,090 acres in 1963, and 66,305 acres in 1964.

Farm Machinery

The numbers of the principal items of farm machinery on rural holdings at the 31st March during each of the five years from 1960 to 1964 are given in the table below :—

VICTORIA—FARM MACHINERY ON RURAL HOLDINGS

Particulars	Number at 31st March—				
	1960	1961	1962	1963	1964
Milking Machines—Units ..	89,657	92,315	95,661	97,372	98,151
Shearing Machines—Stands ..	37,015	37,926	38,758	39,162	39,433
Tractors—Wheeled Type ..	59,438	62,730	65,487	66,479	68,954
—Crawler Type ..	1,730	1,807	1,931	1,936	2,451
Rotary Hoes	9,180	9,284	9,777	9,899	10,205
Fertilizer Distributors and Broadcasters	27,948	29,035	29,349	29,188	28,757
Grain Drills—Combine	18,517	18,749	19,016	19,155	19,905
—Other	9,531	9,501	9,709	†	8,880
Maize Planters	998	*	*	*	*
Headers, Strippers and Harvesters	14,216	13,888	14,065	14,646	14,131
Pick-up Balers	8,040	8,968	9,282	10,107	10,789
Stationary Hay Presses	2,465	2,584	2,213	*	*

* Not collected. † Not available for publication.

NOTE.—Details of items which have not been collected since 1955 are published in the Victorian Year Book 1954-58, page 88.

Mechanization of Farming, 1962

Progress of Cultivation

The first Statistical Register of Victoria published in 1854 shows that in 1836 there were 50 acres of land under cultivation in the Colony of Victoria. By 1840 this figure had increased to 3,210 acres. This progress continued until 1852 when 57,471 acres were under cultivation. With the discovery of gold in Victoria, agricultural progress received a temporary setback, the area of land cultivated declining to 34,816 acres in 1854. However, with the influx of population came a demand for agricultural products and, by the end of 1860, the area of land under cultivation amounted to 407,740 acres.

The following table shows the annual average area under cultivation in each decennium from 1856 to 1955 and the actual area for each of the following nine seasons 1956 to 1964 :—

VICTORIA—ACREAGE CULTIVATED ANNUALLY

Period or Year (Ended March)	Annual Average Area in Each Decennium, 1856-1955, and Actual Area Each Year 1956-1964, under—		
	Crop*	Fallow	Total Cultivation*
	acres		
1856-65	325,676	12,146	337,822
1866-75	624,377	57,274	681,651
1876-85	1,306,920	137,536	1,444,456
1886-95	2,109,326	364,282	2,473,608
1896-1905	3,022,914	524,197	3,547,111
1906-15	3,756,211	1,276,148	5,032,359
1916-25	4,594,244	1,852,145	6,446,389
1926-35	5,233,894	2,501,357	7,735,251
1936-45	4,435,645	2,142,953	6,578,598
1946-55	4,635,982	2,311,401	6,947,383
1956	4,542,096	1,982,742	6,524,838
1957	3,637,352	1,879,812	5,517,164
1958	4,051,249	1,644,764	5,696,013
1959	4,790,989	2,187,212	6,978,201
1960	4,482,757	2,180,266	6,663,023
1961	4,504,732	2,217,789	6,722,521
1962	4,532,686	2,286,771	6,819,457
1963	5,036,686	2,521,355	7,558,041
1964	4,899,557	2,524,863	7,424,420

* Until 1960 the area of crop included pasture cut for hay and seed. From 1961 onwards area of pasture cut for hay and seed is included under pasture.

Crops and Growers

The following table shows the area under, the yield from, and the gross value of each of the principal crops in Victoria for the season 1963-64 :—

VICTORIA—AREA, YIELD, AND GROSS VALUE OF CROPS, 1963-64

Crop	Area	Yield	Gross Value*
	acres		\$
Cereals for Grain—			
Barley—			
2 row	179,827	3,833,033 bushels ..	3,658,094
6 row	10,310	192,481 bushels ..	143,422
Malze	3,399	203,405 bushels ..	273,108
Oats	910,063	19,884,808 bushels ..	13,848,550
Rye	15,275	95,200 bushels ..	155,176
Wheat	3,109,044	76,302,219 bushels ..	108,497,710
Hay—			
Barley and Rye	7,933	11,710 tons ..	193,314
Lucerne	81,394	166,400 tons ..	2,580,018
Meadow	852,356	1,441,178 tons ..	29,264,308
Oaten	168,528	283,132 tons ..	5,542,788
Wheaten	28,273	44,912 tons ..	794,578
Green Fodder	110,507	.. .. .	2,036,090
Grey and Other Field Peas ..	8,326	152,194 bushels ..	324,982
Grass and Clover Seed	29,930	197,994 bushels ..	1,301,318
Industrial Crops—			
Broom Millet	337	1,845 cwt. fibre ..	38,746
		390 cwt. seed ..	1,288
Linseed	16,240	190,322 bushels ..	666,120
Hops	625	5,751 cwt. ..	507,232
Mustard	690	2,438 cwt. ..	30,250
Tobacco	10,519	129,096 cwt. ..	14,059,856
Vegetables—			
Onions	3,756	17,946 tons ..	1,137,800
Potatoes	39,626	200,384 tons ..	15,585,638
Other	41,368	212,935 tons ..	17,075,590
Stock Fodder—			
Pumpkins	229	.. .. .	19,464
Turnips, Beet, &c.	23,792	.. .. .	1,118,224
Vineyards—			
Grapes—			
Table	2,383	8,216 tons ..	1,229,114
Wine	4,990	21,068 tons ..	933,708
Drying	36,112	284,411 tons ..	..
		60,021 tons of sultanas ..	17,597,048
		6,118 tons of raisins ..	1,173,004
		3,939 tons of currants ..	1,801,676
Vines, Unproductive	3,016	.. .. .	..
Orchards—			
Productive	56,606	.. .. .	26,396,382
Unproductive	20,190	.. .. .	..
All Other Crops	6,199	.. .. .	4,822,842
Total Crops	5,781,843	.. .. .	272,807,438

* The gross value is based on the wholesale price realized in the principal markets. The places where primary products are absorbed locally or where they become raw materials for a secondary industry, are presumed to be the principal markets.

The following table shows the numbers of growers of certain primary products, in each statistical district of the State, for the season 1963-64.

The information has no relation to the number of rural holdings in the State, as numbers of occupiers are engaged in the cultivation of more than one of the crops enumerated.

VICTORIA—GROWERS OF CERTAIN CROPS, SEASON
1963-64

Crops Grown	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	Northern	North-Eastern	Gipps-land	
Grain Crops—									
Wheat ..	507	370	706	3,895	2,846	3,362	439	38	12,163
Oats ..	528	529	1,842	2,856	1,585	2,373	679	29	10,421
Barley ..	623	67	267	406	618	571	50	50	2,652
Maize ..	5	2	..	..	1	1	41	174	224
Green Fodder—									
Maize ..	616	66	279	9	7	17	49	986	2,029
All Other ..	1,032	398	1,416	55	68	441	501	1,128	5,039
Other—									
Potatoes ..	1,530	453	497	8	10	15	109	447	3,069
Onions ..	266	2	262	6	23	9	..	16	584
Other									
Vegetables	1,425	30	344	40	323	497	32	124	2,815
Orchards ..	1,807	160	66	115	1,332	1,069	151	69	4,769
Vineyards ..	2	2	..	9	2,397	149	24	..	2,583
Grass and									
Clover Seed	21	74	112	24	17	95	171	9	523
Tobacco ..	..	..	..	..	..	45	318	..	363*

* Excluding share-farmers.

A summary of the area under cultivation in each statistical district of the State for the season 1963-64 is given in the following table :—

VICTORIA—AREA UNDER CULTIVATION, SEASON 1963-64
(Acres)

Crop	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	Northern	North-Eastern	Gipps-land	
Grain Crops—									
Wheat ..	29,934	22,372	55,996	931,935	1,513,100	514,292	39,748	1,667	3,109,044
Oats ..	22,924	23,030	129,850	266,697	261,740	179,395	25,057	1,370	910,063
Barley ..	47,735	2,063	10,363	30,507	64,836	30,263	1,717	2,653	190,137
Maize ..	23	13	..	..	100	1	463	2,799	3,399
Field Peas ..	3,914	344	2,449	431	863	64	56	205	8,326
All Hay ..	155,297	60,609	293,195	101,303	41,785	232,259	94,493	159,543	1,138,484
Green Fodder	21,716	8,552	39,118	1,946	1,958	8,988	8,637	19,592	110,507
Grass and Clover									
for Seed ..	1,338	4,300	6,558	1,174	2,240	5,993	7,926	401	29,930
Tobacco ..	..	..	..	..	..	799	9,720	..	10,519
Potatoes ..	21,173	6,780	5,742	21	118	72	715	5,005	39,626
Onions ..	1,114	9	2,445	4	40	6	..	138	3,756
All Other									
Vegetables ..	20,614	144	11,628	139	2,805	4,052	177	1,809	41,368
Vines ..	4	40	..	755	43,573	803	1,326	..	46,501
Orchards ..	25,251	2,577	610	4,061	8,146	33,783	1,818	550	76,796
All Other Crops	10,851	763	23,201	169	15,160	3,016	1,603	8,624	63,387
Total Area under									
Crop ..	361,888	131,596	581,155	1,339,142	1,956,464	1,013,786	193,456	204,356	5,781,843
Land in Fallow	59,339	26,583	62,042	783,611	1,159,115	391,462	17,932	24,779	2,524,863
Total Area under									
Cultivation ..	421,227	158,179	643,197	2,122,753	3,115,579	1,405,248	211,388	229,135	8,306,706

The following table shows the yields, in statistical districts, of the principal crops for the season 1963-64 :—

VICTORIA—YIELDS OF PRINCIPAL CROPS, SEASON 1963-64

Crop	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	Northern	North-Eastern	Gipps-land	
Grain Crops—									
Wheat bush.	736,714	595,169	1,344,488	26,366,766	35,027,275	11,512,612	684,754	34,441	76,302,219
Oats "	540,406	633,921	4,062,301	5,757,304	4,567,236	3,800,908	507,924	14,808	19,884,808
Barley "	1,210,324	44,704	256,097	650,672	1,110,839	661,974	24,320	66,584	4,025,514
Maize "	290	320	..	..	4,600	15	19,118	179,062	203,405
Field Peas "	75,172	5,360	44,448	6,718	15,671	1,591	1,079	2,155	152,194
All Hay tons	284,727	108,682	468,690	144,107	56,580	388,175	177,774	318,597	1,947,332
Grass and Clover for Seed cwt.	1,322	6,182	9,019	1,229	2,443	8,809	12,158	177	41,339
Tobacco "	..	..	..	..	..	7,299	121,797	..	129,096
Potatoes tons	106,171	29,999	30,749	95	732	289	2,155	30,194	200,384
Onions "	6,009	4	10,625	29	256	36	..	987	17,946
Wine Made gall.	*	..	..	*	*	*	*	..	3,704,891
Dried Vine Fruits—									
Raisins tons	..	..	..	..	6,117	..	..	..	6,117
Sultanas "	..	..	..	..	60,021	..	..	..	60,021
Currants "	..	..	..	..	3,934	..	..	..	3,934

* Details for individual districts are confidential.

Principal Crops

General

The cereals wheat, oats, and barley are the principal crops grown in Victoria and these, together with hay, represent about 90 per cent. of the total area sown, although there is some variation from year to year. The growing of potatoes, grapes, and apples is also important.

In the following section some detailed descriptive and statistical information is given for all main crops grown in the State including those mentioned above.

Wheat

The acreage sown to wheat in recent years has increased to approximately 3 mill. acres. This is about half the total area under crop in the State. Virtually all the wheat crop is used for grain production, only about one per cent. being cut for hay. The average annual production for the five years ended 1963-64 was about 61 mill. bush., of which about 65 per cent. was exported. Grain yields during the past five years averaged about 22 bush. (60 lb. per bush.) per acre, but yields as high as 60 bush. per acre are harvested on individual farms in most seasons. The highest officially recorded yield is 78·8 bush. per acre for 50 acres grown near Murtoa in 1960.

The main wheat belt lies in the northern part of the State, in the Mallee, Wimmera, and Northern Districts, where about 93 per cent. of the crop is grown. The average rainfall in these Districts varies from 10 inches in the extreme north-west of the State to about 20-22 inches at the eastern and southern margins of the main wheat belt. About three-quarters of the wheat crop is sown on bare fallowed land.

Superphosphate is applied at seeding to virtually all crops. Zinc sulphate is added in the Wimmera District, applications normally being made to each third or fourth wheat crop. Small amounts of nitrogenous fertilizers have been used in particular circumstances, especially in view of the more favourable wheat/nitrogen fertilizer price relationships now existing. Diseases are not normally a major problem, but occasionally some heavy losses occur due to stem rust and foot rots. Ball smut is effectively controlled by pickling, which is done at the same time as the wheat is graded. Weeds are controlled by fallow cultivation or by crop spraying. The crop is harvested from mid-November in the early districts to January under late conditions.

Wheat is grown in rotation with fallow, other crops, and pastures. The use of subterranean clover and medic leys has greatly improved soil fertility, with resultant benefit to wheat yields and quality. (See Victorian Year Book 1963, pages 517 to 519.) Sheep grazed on these, and on native pastures, contribute materially to the State's wool and fat lamb production, especially to the production of early fat lambs.

Wheat is grown on three major soil types :—(1) Mallee soils referred to as solonized brown soils ; (2) self-mulching grey soils of heavy texture and high fertility in the southern Wimmera ; and (3) red-brown earths of varying texture in the northern Wimmera and the Northern District.

The wheat varieties grown in Victoria are of the soft white class. The environment generally does not favour the production of wheat of the harder types, but attention is being given to this in the eastern Mallee. Substantial improvement in wheat quality has been achieved by plant breeding during the past 30 years, and several of the soft wheats available reach the medium to strong class. The adoption of clover and medic ley rotation systems has led to a substantial improvement in the protein content, and thus the quality, of Victorian wheat.

Virtually the whole of the wheat crop is handled, stored, and transported in bulk. The whole of the crop is marketed through the Australian Wheat Board. Victorian wheat is marketed in one grade known as f.a.q. (fair average quality).

Grain Elevators Board

In 1934, an Act was passed to provide for the handling of wheat in bulk in Victoria. The Act gave the Government power to constitute a Board of three members to implement the provisions of the Act. On submissions made by the Board to, and approved by, the Government, 233 country receiving elevators and a shipping terminal have been constructed, the necessary finance being obtained from loans totalling \$18,086,000. Repayment of the principal and interest are guaranteed by the Victorian Government. In 1963 the Act was amended to provide for the handling of barley in bulk by the Grain Elevators Board.

The Grain Elevators Board first received and shipped Victorian wheat in bulk for the 1939-40 season.

The Board's Geelong Terminal is the most modern and the largest single wheat shipping terminal in the world. Its operation is by push-button remote control with operational indicator lights appearing on a diagram panel of the whole terminal. Wheat can be received from rail trucks at the rate of 1,200 tons per hour and can be shipped from the terminal at the rate of 1,600 tons per hour, either direct from the terminal storage bins or by a combination of storage bins and rail receivals.

The Grain Elevators Board has under its control storage for 86 million bushels of wheat. The largest quantity of wheat delivered to railway stations by Victorian growers in any one season prior to the 1964-65 season was 76,051,000 bushels in 1963-64. A new record was established during the 1964-65 season when 79,000,000 bushels were delivered. In addition, during the 1964-65 season 1,354,000 bushels of bulk barley were delivered to the Board.

The following statement shows the revenue and expenditure of the Grain Elevators Board in Victoria :—

**VICTORIA—GRAIN ELEVATORS BOARD : REVENUE,
EXPENDITURE, ETC.**
(\$'000)

Particulars	Year Ended 31st October—				
	1960	1961	1962	1963	1964
REVENUE					
Australian Wheat Board—Operating and Maintenance Expenses	1,026	1,408	1,388	1,484	1,726
Australian Wheat Board—Capital Facilities Allowance	700	740	752	930	1,258
Interest on Investments	180	206	308	340	326
Other	2	..	2	..	13
Total Revenue	1,908	2,354	2,450	2,754	3,324
EXPENDITURE					
Operating and Maintenance Expenses	582	924	862	890	1,023
Administration Expenses	214	256	270	270	336
Depreciation and Renewals	228	228	256	324	392
Interest on Loans	376	414	534	682	826
Sinking Fund Charges	68	84	100	128	158
Appropriations to Reserves	504*	328	412	446	637
Other	14	12	12	..	..
Total Expenditure	1,986	2,246	2,446	2,740	3,372
Net Surplus	—78	108	4	14	—48
Fixed Assets (At 31st October) ..	8,858	9,326	11,256	14,524	19,157
Loan Indebtedness (At 31st October)—					
State Government	1,870	1,848	1,826	1,804	1,780
Public	6,390	7,790	9,334	12,192	15,099

* Including \$200,000 appropriated from profits accumulated in previous years.

Australian Wheat Board

The Australian Wheat Board is the sole constituted authority for the marketing of wheat within Australia and for the marketing of wheat and flour for export from Australia during the period of the present Wheat Industry Stabilization Plan. The Board consists of a Chairman and four other Commonwealth Government appointees and ten members who are representatives of wheat growers in the five main wheat growing States, each State being represented by two members.

The current five year Wheat Industry Stabilization Plan commenced with the 1963-64 crop and provides for a guaranteed price to wheat growers on up to 150 million bushels of exports from each season's wheat. The guaranteed price of wheat of a particular season is an amount equal to the cost of production of wheat of that season as determined in accordance with the Commonwealth Wheat Industry Stabilization Act and for season 1963-64 it was fixed at \$1.44 per bushel. For the second year (1964-65) of the Stabilization Plan the cost of production and thus the guaranteed price has been increased by 2 cents to \$1.46 per bushel. The prices referred to are on a bulk wheat basis f.o.r. ports.

Total deliveries by wheat growers to the Victorian Branch of the Australian Wheat Board during season 1963-64 were 77,726,000 bushels including 3,364,000 bushels of southern New South Wales wheat delivered to railway stations operated by Victorian Railways in New South Wales, and 1,849,000 bushels of southern New South Wales wheat delivered to Victorian stations.

With the exception of East Northern areas, where the intended acreage sown was reduced because of excessive moisture, the remainder of the wheat growing areas enjoyed favourable sowing and growing conditions, particularly the large Mallee acreage which throughout the whole season showed promise of big production. This promise was subsequently fulfilled with a record yield per acre for the area. Excellent harvesting conditions prevailed over the whole State and the f.a.q. sample was of a high standard, being equal to the best on record of 65½ lb. per bushel. The average yield per acre for this season was 24.54 bushels.

Wheat Standard

The fair average quality (f.a.q.) standard is fixed each season by a State Committee and is the basis for sales of each crop.

Samples of wheat from various districts are obtained each year and mixed to obtain a representative sample of the whole crop. The f.a.q. weight is then determined by use of the Schopper 1-litre scale chondrometer.

Farmers Growing Wheat for Grain, Area Sown, Production, Gross Value, and F.A.Q.

In the following table the number of farmers engaged in growing 20 acres or more of wheat for grain, the area, production, average yield, gross value of production of wheat, and the f.a.q. standard

determined in Victoria for each of the seasons 1959-60 to 1963-64 are shown :—

VICTORIA—WHEAT STATISTICS

Season	Holdings Growing Wheat (20 Acres and over)	Area	Production	Yield per Acre	Gross Value	Weight of Bushel of Wheat, f.a.q.
	No.	'000 acres	'000 bush.	bush.	\$'000	lb.
1959-60 ..	10,561	2,261	38,793	17·16	53,487	62½
1960-61 ..	10,625	2,672	67,587	25·30†	96,487	64¾
1961-62 ..	11,648	2,849	56,878	19·97	85,394	64
1962-63 ..	12,166	3,125	67,899	21·73	98,910	65½
1963-64 ..	11,370	3,109	76,302*	24·54	108,498	65½

* Record production.

† Record yield per acre.

Wheat Breeding

The objective of wheat breeding in Victoria is to produce new varieties which will give higher yields of better quality grain than existing varieties. Included in the yield objective is the reduction of losses due to drought and various diseases which include stem rust (the most important), leaf rust, septoria, loose smut and eye spot lodging. The breeding work is a function of the Victorian Department of Agriculture, which undertakes plant breeding, field testing, and quality evaluation. The wheat breeding activities of the Department are centred on the State Research Farm at Werribee where the hybridization is carried out, the early generations raised, and the primary quality and disease testing done. This station is supplemented by regional selection centres in the main wheat growing districts. Field testing is undertaken in all districts at departmental research stations and colleges and on farmers' properties. The number of centres for varietal testing in Victoria is nearly 40. Disease testing is carried out at research stations in appropriate areas and at the Plant Research Laboratories at Burnley. Quality evaluations, including test baking, are undertaken at the Department's Cereal Laboratories in Melbourne.

The wheat breeding work of the Department has been very successful. During the past 50 years, 40 new wheats have been released for cultivation by farmers. The most widely grown of these have been Free Gallipoli (1923), Ghurka (1924), Rancee 4H (1930), Magnet (1939), Quadrat (1941), Insignia and Pinnacle (1946), Sherpa (1953), and Olympic (1956). Ninety-five per cent. of the wheat acreage in Victoria is sown to varieties bred by the Department. Since 1930, the baking quality of Victorian wheat has improved markedly.

The varieties released for sowing since 1946 are : 1946—Insignia, 1946—Pinnacle, 1947—Diadem, 1953—Sherpa, 1956—Olympic, 1957—Beacon, 1960—Stockade, and 1963—Emblem.

The following table shows the areas under the principal varieties of wheat, including wheat for hay, for the seasons 1961-62, 1962-63, and 1963-64. Varieties are tabulated in order of popularity for the last mentioned season.

VICTORIA—PRINCIPAL VARIETIES OF WHEAT SOWN

Variety (In Order of Popularity), Season 1963-64	1961-62		1962-63		1963-64	
	Acres Sown	Percentage of Total Area Sown	Acres Sown	Percentage of Total Area Sown	Acres Sown	Percentage of Total Area Sown
Insignia ..	1,357,440	47·13	1,516,564	47·96	1,635,619	52·13
Pinnacle ..	683,027	23·72	764,009	24·16	681,159	21·71
Olympic ..	482,194	16·74	503,082	15·91	463,827	14·79
Insignia 49 ..	71,235	2·47	80,529	2·54	86,813	2·77
Sherpa ..	107,724	3·74	101,022	3·20	68,814	2·19
Heron ..	7,743	0·27	32,677	1·03	53,432	1·70
Quadrat ..	78,494	2·73	58,727	1·86	43,722	1·39
Stockade ..	2,226	0·07	18,106	0·58	29,218	0·93
Beacon ..	19,261	0·67	25,879	0·82	23,091	0·74
Baldmin ..	15,099	0·53	13,271	0·41	9,406	0·30
Sabre ..	9,098	0·32	10,488	0·34	8,409	0·27
All Other Varieties ..	46,361	1·61	37,575	1·19	33,807	1·08
Total ..	2,879,902	100·00	3,161,929	100·00	3,137,317	100·00

Wheat Growing in Conjunction with Livestock Grazed

A table showing the number of holdings in Victoria growing wheat for grain together with sheep, dairy cattle, beef cattle, and pigs as at 31st March, 1960, appears on page 491.

Oats

Oats are the second most widely grown crop in Victoria, and in recent years the area of this cereal has averaged about 1·2 mill. acres. Nearly 70 per cent. of this is harvested for grain, some of it after winter grazing. Although oaten hay was important in the past, only about 17 per cent. of the acreage is now harvested for this purpose, the remainder of the area being used solely for grazing.

As the land on which oats are grown is normally not fallowed or does not receive as good seedbed preparation as that intended for wheat, oat production shows greater fluctuations than does wheat production. This seasonal variability is particularly marked in the northern parts of the State. The average annual grain production is about 20 mill. bush. (40 lb. per bushel), ranging in the last ten years from 9·5 mill. bush. in 1957-58 to 27 mill. bush. in 1962-63.

Over half the oat grain produced in Victoria is held on farms or is used within Victoria for stock feed. Large quantities are retained for feeding during periods of seasonal shortage or in drought conditions. About a quarter of the crop goes to mills, but only a relatively small proportion is used to manufacture foods for human consumption. The proportion of oats purchased in the milling grades is approximately 10 per cent. of the oats marketed. Milling grades usually command a premium of 2 cents to 10 cents per bushel above feed oats. The other

uses of the grain by the mills are for the manufacture of stock foods and for the manufacture of unkilned rolled oats, mainly for export. The remaining quarter of the crop is exported as grain. More than 95 per cent. of the oats exported are sold as "Victorian Feed" grade. Oat grain is sold in an open market through merchants or through the voluntary oat pool, and prices fluctuate widely according to seasonal conditions and supplies available.

With the decline in the number of horses throughout the State, there has been a corresponding decline in the area of oats used for hay production, particularly in the main cereal growing districts. However, during the past ten years, the area cut for hay has fluctuated around 200,000 acres. The hay may be cut either for farm use or for sale (mainly to chaff mills near Melbourne, Ballarat, and Maryborough).

Most of the area fed-off completely is grazed by sheep in the winter, but in dairying districts oats are sometimes sown for autumn and winter grazing to supplement pasture growth. About 32 per cent. of the oats completely grazed are in the Mallee District.

The main oat grain producing areas are in the Mallee, Wimmera, Northern, and Western Districts. The popularity of varieties has undergone marked changes in recent years. After having held supremacy for more than 40 years, Algerian was superseded as the leading variety by Orient in 1962, while Avon now holds this position. The area sown to the five leading varieties—Avon, Orient, Algerian, Ballidu, and Kent—is nearly 90 per cent. of the total oat acreage in the State.

The area harvested (season 1963-64) for hay was 168,528 acres, and for grain 910,063 acres, which produced 283,132 tons of hay, and 19,884,808 bushels of grain respectively. The area of oats sown for grazing purposes amounted to 159,546 acres. The following table shows the area, yield, and gross value of oats for grain for each of the five seasons 1959-60 to 1963-64 :—

VICTORIA—OATS FOR GRAIN

Season			Area	Production	Yield per Acre	Gross Value
			'000 acres	'000 bushels	bushels	\$'000
1959-60	..	..	673	12,701	18·87	9,594
1960-61	..	..	835	20,666	24·75	12,958
1961-62	..	..	774	16,312	21·06	11,464
1962-63	..	..	932	27,042*	29·01	18,412
1963-64	..	..	910	19,885	21·85	13,849

* Record production.

Barley

The maximum barley production was in 1958–59, when about 362,000 acres (2- and 6-row) were sown, with a production of approximately 8·6 mill. bush. (50 lb. per bushel), but, since then, area and production have declined because of changed markets and other factors. Well over 90 per cent. of the barley grown in Victoria is of 2-row or malting type. The remainder is sown with 6-row varieties, which are used primarily for feed.

Although some barley is grown in all districts, the main production is centred in two distinct areas where high quality grain is produced. The largest production is in the south-western Mallee and the adjacent area of the north-western Wimmera. While wheat is the main cereal throughout the cereal-growing districts, the barley crop occupies second position in the areas noted above, whereas, in most other portions of northern Victoria, oats occupy this position.

In this northern barley growing area, the best quality barley is grown on the sandier soil types. The crop is sown either on ley land cultivated in the autumn just prior to sowing or on wheaten stubble land. The variety Prior is almost exclusively sown in this area, and superphosphate is the standard fertilizer applied. Average district yields are about 18 bushels per acre.

The other important area is in southern Victoria between Geelong, Werribee, and Bacchus Marsh. Here, barley is the main crop, and the normal practice is to sow it with superphosphate on fallowed land. The main variety has been Research, but Resibee and Anabee, released by the Department of Agriculture in 1961 and 1962, respectively, are now being grown to an increasing extent. While Research produced very good malting quality grain in this area, the new varieties have quality characteristics superior to those of the older variety. Yields are considerably higher than those obtained in the north, the average yield being about 33 bushels per acre. This region is close to the main barley shipping terminals, and growers' freight costs are thus considerably lower than in the northern areas.

In 1963, a bulk handling scheme for barley was introduced at Beulah in the southern Mallee, and the scheme was extended in 1964 to six additional receival points in the Mallee and Wimmera, one in the Northern District and two in the Central District. Barley is marketed through the Australian Barley Board, which operates in Victoria and South Australia and provides an orderly marketing system for barley grown in those States. All the barley is classified on sample before delivery. Classification is, firstly, on varietal type—Chevalier (Prior and similar varieties) and Research (Research, Resibee, Anabee)—and, secondly, on quality—Malting (Nos. 1 and 2), Milling (No. 3), and Feed (Nos. 4 and 5). There are price differentials for each grade.

Practically all the barley of malting quality is malted in Australia for local use or export as malt—principally to Eastern destinations. Most of the milling and feed grades are exported, chiefly to Europe and Eastern Asia.

The following table shows the area, yield, and gross value of barley for each of the five seasons 1959-60 to 1963-64 :—

VICTORIA—BARLEY PRODUCTION

Season	Area		Production		Yield per Acre			Gross Value
	Malting (2 row)	Other (6 row)	Malting (2 row)	Other (6 row)	Malting (2 row)	Other (6 row)	Total	
	'000 acres		'000 bushels		bushels			\$'000
1959-60 ..	264	14	5,318	274	20·17	19·79	20·15	5,286
1960-61 ..	293	16	7,392	327	25·19	20·66	24·95	6,632
1961-62 ..	212	13	4,415	239	20·79	18·26	20·64	5,056
1962-63 ..	180	14	5,129	340	28·45	24·22	28·14	5,310
1963-64 ..	180	10	3,833	192	21·32	18·67	21·17	3,802

Maize

Maize for grain is cultivated mainly in Gippsland. It is grown in Victoria both for grain and for green fodder. The area, yield, and gross value of maize for each of the five seasons 1959-60 to 1963-64 are given in the following table :—

VICTORIA—MAIZE PRODUCTION

Season	For Green Fodder	For Grain							Gross Value
		Area			Production			Yield per Acre	
		Hybrid	Other	Total	Hybrid	Other	Total		
		acres			bushels			\$'000	
1959-60 ..	9,084	2,981	402	3,383	167,489	12,965	180,454	53·34	263
1960-61 ..	11,681	2,742	243	2,985	162,682	8,422	171,104	57·32	274
1961-62 ..	15,440	2,999	310	3,309	181,745	10,029	191,774	57·96	248
1962-63 ..	15,970	3,138	496	3,634	197,376	18,788	216,164	59·48	286
1963-64 ..	11,741	3,108	291	3,399	194,585	8,820	203,405	59·84	273

Rye

Cereal rye is of minor importance in Victoria and is not grown primarily as a cash crop. European migrants to Australia have created a small demand for this cereal for human consumption, thus helping to stabilize the market for rye grain.

The chief purpose for which rye is grown is the stabilization of loose sand or sandhills in the Mallee District. There is some interest in it for winter grazing in cold districts during the winter months.

The following table shows the area, yield, and gross value of rye for each of the five seasons 1959-60 to 1963-64 :—

VICTORIA—RYE PRODUCTION

Season	Area	Production	Yield per Acre	Gross Value
	acres	bushels		\$'000
1959-60	22,344	138,438	6.20	178
1960-61	22,895	187,659	8.20	235
1961-62	17,849	136,725	7.66	185
1962-63	17,551	114,639	6.53	171
1963-64	15,275	95,200	6.23	155

Hay

The pattern of hay production in Victoria has changed considerably in the post-war period. More complete mechanization and the virtual disappearance of the working horse have taken the emphasis from cereal hay. The harvesting of large areas of cereal crops, particularly oats, grown specifically for the production of hay for the maintenance of horse teams, is no longer necessary and there has been a marked decline in the amount of cereal hay produced.

On the other hand, there have been spectacular increases in the production of other forms of fodder. The annual production of meadow hay has increased from about 400,000 tons to over 1.4 mill. tons during this period. There has also been a substantial increase in the amount of lucerne hay conserved. Silage has become an important supplement to hay for stock feeding, and silage produced mainly from pasture growth has increased from about 25,000 tons annually to over 300,000 tons in the post-war period.

This increase in fodder conservation has resulted in more efficient utilization of the extra herbage grown as the result of pasture improvement in all districts. Large numbers of livestock are now being maintained with greater safety following the conservation of portion of the surplus spring growth for feeding out during periods of seasonal shortage or in drought.

As pastures have been improved and livestock production intensified, the provision of supplementary fodder has become an important factor in the Victorian grazing industry. The conservation of meadow hay fits in well with farm management routine and is a convenient method of ensuring continuity of fodder supplies.

Particulars of areas harvested and production of the several kinds of hay appear in the following table :—

VICTORIA—HAY PRODUCTION, 1963–64

Kind	Area	Production	Yield per Acre
	acres	tons	tons
Wheaten	28,273	44,912	1·59
Oaten	168,528	283,132	1·68
Lucerne	81,394	166,400	2·04
Barley, Rye, &c.	7,933	11,710	1·48
Meadow	852,356	1,441,178	1·69
Total	1,138,484	1,947,332	1·71

The following table shows, in respect of each statistical district of the State, the quantity of ensilage made during the 1963–64 season, and the stocks of ensilage and hay held on rural holdings at the 31st March, 1964 :—

VICTORIA—ENSILAGE MADE AND FARM STOCKS OF
ENSILAGE AND HAY
(Tons)

Statistical District	Ensilage Made, 1963–64	Stocks at 31st March, 1964	
		Ensilage	Hay
Central	70,845	47,115	254,114
North-Central	8,783	8,710	93,724
Western	24,341	18,343	392,321
Wimmera	3,981	8,706	178,783
Mallee	4,413	13,162	62,085
Northern	13,132	17,787	414,361
North-Eastern	30,258	25,055	211,158
Gippsland	97,084	46,237	304,929
Total	252,837	185,115	1,911,475

Potatoes

Victoria is the largest producer of potatoes in Australia, contributing a little more than 40 per cent. of the total annual requirement. The bulk of the Victorian crop is used within the State for human consumption and seed purposes, the surplus being exported to other States to augment local supplies. Potatoes are generally used as a fresh vegetable, but there is increasing interest in processed forms. Generally regarded as a summer crop, potato planting goes on in one district or another for ten months of the year, while harvest extends over the whole year.

Early crops are grown in favoured localities where the risk of frost is not great, such as in the Bellarine Peninsula and the market garden areas south-east of Melbourne. These are lifted from October (or sooner) to December. Mid-season crops come on the market in January, February, and March from districts such as Koroit, Gembrook, Koo-Wee-Rup, and parts of Gippsland. The late or main crop is produced in the Central Highlands (Ballarat to Trentham), Kinglake, Otways, and the Gippsland hill country. Harvest commences in April and runs on until October.

Spray irrigation is now common in most districts and has proved useful in tiding crops over the short but critical dry periods that occur in mid-summer in the State's higher rainfall areas. Potato growing has become increasingly mechanized and production has therefore tended to pass into the hands of specialist growers having larger individual areas.

The following table shows the area, yield, and value of potatoes for each of the five seasons 1959-60 to 1963-64 :—

VICTORIA—POTATO PRODUCTION

Season			Area	Production*	Yield per Acre	Gross Value
			acres	tons		\$'000
1959-60	..	..	48,506	242,548	5.00	11,616
1960-61	..	..	38,672	180,819	4.68	18,686
1961-62	..	..	36,469	196,032	5.38	13,048
1962-63	..	..	43,024	254,473	5.91	6,612
1963-64	..	..	39,626	200,384	5.06	15,586

* Includes amounts held on farms for seed, stock feed, &c., as follows :—31,951 tons in 1959-60 ; 23,910 tons in 1960-61 ; 25,506 tons in 1961-62 ; 32,688 tons in 1962-63 ; and 22,897 tons in 1963-64

Onions

The principal onion growing areas are in the Central and Western Districts. In the season 1963-64 these areas were responsible for 87 per cent. of the total onion production of the State. The following table shows the area, yield, and gross value for each of the five seasons 1959-60 to 1963-64 :—

VICTORIA—ONION PRODUCTION

Season			Area	Production	Yield per Acre	Gross Value
			acres	tons		\$'000
1959-60	..	..	3,994	27,808	6.96	2,024
1960-61	..	..	3,532	16,286	4.61	1,500
1961-62	..	..	4,456	23,784	5.34	1,588
1962-63	..	..	4,634	26,175	5.65	1,390
1963-64	..	..	3,756	17,946	4.78	1,138

Linseed

Linseed is the major oil producing crop grown in Victoria. Its commercial production, which began in 1947, has now increased to over 25,000 acres in suitable years, with an output in excess of 300,000 bushels. In wet seasons, however, such as 1963, weather and soil conditions seriously cut the intended acreage.

Linseed has proved to be well adapted to broad acre production over a wide area of mixed farming and pastoral country in the 20 to 30 inch rainfall zone in the western part of Victoria. Initially, the industry was developed on imported varieties, and, in the period up to 1955, yields were low because these varieties were not fully suited to Victorian conditions and because of their susceptibility to disease.

Greater stability has been given to the industry with the release by the Victorian Department of Agriculture of disease resistant and better adapted varieties. Other factors influencing the expansion of the industry have been the improved technical knowledge available to growers, price stability, and the decline of flax growing.

Victorian linseed contains 38 to 40 per cent. of oil of satisfactory quality. Linseed oil is one of the main components of paints, varnishes, and linoleum, and also has many other industrial uses. The meal or press cake which remains after the oil has been extracted is a valuable stock food.

The following table shows the area, yield, and value of linseed for each of the five seasons 1959-60 to 1963-64 :—

VICTORIA—LINSEED PRODUCTION

Season			Area	Production	Yield per Acre	Gross Value
			acres	bushels		\$'000
1959-60	..	..	24,850	295,644	11·90	1,070
1960-61	..	..	6,179	39,356	6·37	142
1961-62	..	..	17,711	243,700	13·76	853
1962-63	..	..	25,232	327,216	12·97	1,145
1963-64	..	..	16,240	190,322	11·72	666

Tobacco

The production of cigarette leaf constitutes the main aim of the Australian tobacco-growing industry. The use of domestic leaf is encouraged by a statutory mixing percentage applied in conjunction with concessional rates of import duty. At the present high level of usage, it is important that only leaf of desirable smoking quality is produced. Such leaf can be grown with some certainty only in areas having light infertile soils and, during the summer months, appreciable rainfall, moderate temperatures, and high atmospheric humidity.

The Victorian crop usually accounts for rather more than one-third of the total Australian tobacco production. Suitable growing conditions are found in the north-eastern river valleys, and the industry is concentrated at present along the Ovens and King Rivers and their tributaries, with small outlying areas in the northern part of the State. Recent trends disclose a concentration of production in the higher parts of these valleys, with some contraction at certain climatically less favoured downstream centres and in the inundated area above the Buffalo River dam. The Mount Beauty district in the upper Kiewa Valley has latterly become established as a reliable centre for the production of good quality leaf.

Tobacco growing in Australia has traditionally been regarded as a rather speculative proposition due to wide fluctuation in market conditions and average yields, and it is only in the past decade that any degree of stability has become apparent due to an upward trend in average yield. This has resulted in the Victorian figure approaching a level comparable to that achieved by the world's major tobacco producing countries.

The fungus disease, blue mould, has often brought about drastic reduction of yield and has been the prime cause of most short Victorian crops in the past. At present growers are able to control this disease by implementing newly developed fungicidal spray programmes, and this is perhaps the main factor in current yield improvement.

The establishment of a Tobacco Leaf Marketing Board is expected to consolidate stability in the industry through orderly crop disposal.

Victorian tobacco producers are assisted in their efforts to increase yield and improve leaf quality by the Department of Agriculture, which conducts research in agronomy, plant pathology, and plant breeding at the Tobacco Research Station at Ovens and its sub-station at Gunbower, and also provides an intensive advisory service for growers.

The following table shows the area, yield, and gross value of tobacco in each of the five seasons 1959-60 to 1963-64 :—

VICTORIA—TOBACCO PRODUCTION

Season			Area	Production	Yield per Acre	Gross Value
			acres	cwt. (dry)		\$'000
1959-60	..	..	6,424	66,080	10.29	8,292
1960-61	..	..	9,932	86,854	8.74	8,450
1961-62	..	..	9,286	58,168	6.26	7,278
1962-63	..	..	9,844	84,351	8.57	10,210
1963-64	..	..	10,519	129,096	12.27	14,060

Further Reference, 1963

Fruit Industries

Victoria is a major producer of a wide variety of fruit and nearly 120,000 acres are used for orchards or vineyards. The three most important districts are the area within 50 miles of Melbourne (apples, dessert tree fruits, and berries), the Goulburn Valley (canning fruit), and the Mallee region (dried vine fruit and citrus).

Most of the fruit growing districts south of the Dividing Range receive an annual rainfall of between 25 and 35 inches. This rainfall is fairly evenly spread, but in many areas additional irrigation is essential during January-March. This water is supplied from natural catchments, rivers, or town supplies. The north-eastern section of the State has a rainfall of from 20 to 40 inches, but the average rainfall in the Goulburn Valley is 19 inches and in the Mallee only 10 inches. In these districts elaborate irrigation schemes of the Lower Murray Valley and of the Goulburn and Campaspe Rivers make possible the large scale development of the fruit industry. The distribution of water is effected mainly by gravity except for small areas of citrus under spray irrigation.

Because of the high capital expenditure invested in orchard land and equipment and with the keen competition for local and oversea markets, most Victorian growers realize that they have to produce increased quantities of better quality fruit without increasing costs. To achieve this, labour expenses are cut by high capacity spraying units for pest control and by bulk handling of the crop. Many orchardists

use fruit thinning sprays to make hand thinning less time consuming. The increasing use of weedicides in orchards and vineyards has made less frequent cultivation possible. Lighter pruning of apples is showing promising results in Southern Victoria and this trend could also become an important factor in reducing labour costs.

Statistics on fruit growing are collected from all persons who grow fruit for sale (for all purposes). Particulars of fruit production (excluding vines) for the five seasons 1959-60 to 1963-64 are given in the following table :—

VICTORIA—FRUIT GROWING

Particulars	1959-60	1960-61	1961-62	1962-63	1963-64
Number of Growers	5,076	4,783	4,700	4,807	4,769
Area acres	68,657	71,415	72,712	75,855	76,796
Gross Value of Fruit Produced (\$'000)	21,060	25,358	25,356	23,546	26,396
Kind of Fruit—					
Apples bushels	3,005,669	3,134,917	3,045,808	4,059,045	3,298,851
Pears "	3,582,549	3,704,278	4,605,808	3,848,614	4,771,604
Quinces "	19,595	20,563	32,564	22,017	29,909
Apricots "	468,055	206,521	631,810	535,235	352,557
Cherries "	101,189	90,297	137,494	116,920	109,783
Nectarines "	18,896	14,981	16,940	20,713	21,717
Peaches "	1,210,021	955,224	1,686,496	1,811,799	1,827,910
Plums "	156,940	106,833	184,723	141,953	137,431
Prunes "	26,594	23,853	24,383	24,346	19,332
Lemons "	156,217	199,535	150,738	212,693	105,115
Oranges—					
Navels "	447,817	343,659	399,168	531,249	479,580
Valencias "	538,710	314,730	543,832	586,991	605,916
Other Oranges "	42,184	31,024	42,167	45,495	48,879
Mandarins "	20,081	27,095	27,824	41,297	36,410
Grapefruit "	67,214	69,844	80,902	97,217	88,596
Figs "	3,218	2,273	2,349	2,264	2,462
Passion-fruit "	2,197	2,680	2,288	3,601	5,762
Olives "	11,741	23,425	13,178	14,845	36,367
Gooseberries cwt.	1,172	703	775	865	606
Loganberries "	2,462	2,144	1,787	1,684	1,451
Raspberries "	2,862	2,616	2,936	2,848	3,018
Strawberries "	6,692	6,531	10,712	15,172	16,817
Youngberries "	3,833	4,172	4,649	4,891	3,607
Other Berries "	1,505	625	679	964	978
Almonds lb.	115,444	74,900	141,819	64,599	69,366
Filberts "	6,590	7,244	15,510	6,608	14,750
Walnuts "	149,136	148,357	135,254	146,020	150,982

The production of the principal kinds of dried tree-fruits for each of the last five seasons is shown in the following table. Particulars in respect of dried vine-fruits appear on pages 516–517.

VICTORIA—DRIED TREE-FRUITS
(lb.)

Year Ended 31st March—	Apricots	Peaches	Pears	Prunes	Others	Total
1960	38,067	5,417	3,505	460,806	2,429	510,224
1961	33,820	4,510	2,290	368,731	626	409,977
1962	17,844	..	3,925	397,841	620	420,230
1963	31,421	2,278	4,652	590,323	1,988	630,662
1964	19,810	5,390	6,714	481,648	309	513,871

Information on the number of trees of each variety is collected triennially; the latest figures available are for the season 1961–62. The extent of cultivation of each important class of fruit and nuts on holdings of 1 acre and upwards during the seasons 1958–59 and 1961–62 is shown in the following table :—

**VICTORIA—FRUIT TREES, PLANTS, ETC., IN ORCHARDS
AND GARDENS**

Fruit and Nuts	Number of Trees, Plants, &c.					
	1958–59			1961–62		
	Bearing	Not Bearing	Total	Bearing	Not Bearing	Total
Apples	1,498,638	511,163	2,009,801	1,531,839	664,194	2,196,033
Pears	1,124,220	376,722	1,500,942	1,189,246	548,139	1,737,385
Quinces	21,402	922	22,324	13,099	481	13,580
Plums	146,136	38,127	184,263	137,450	48,047	185,497
Prunes	25,332	6,385	31,717	26,990	8,575	35,565
Cherries	117,292	48,813	166,105	117,078	65,327	182,405
Peaches	540,124	607,039	1,147,163	842,117	634,192	1,476,309
Apricots	312,979	89,970	402,949	317,157	68,495	385,652
Nectarines	18,103	5,296	23,399	13,252	12,219	25,471
Oranges—						
Navels	166,147	24,729	190,876	175,563	60,572	236,135
Valencias	190,266	60,475	250,741	208,758	89,498	298,256
Other Oranges	16,137	1,620	17,757	18,904	2,874	21,778
Mandarins	9,252	9,676	18,928	13,049	23,144	36,193
Grapefruit	22,917	1,541	24,458	21,898	4,663	26,561
Lemons and Limes	89,869	14,704	104,573	80,162	27,326	107,488
Figs	5,840	983	6,823	3,402	1,294	4,696
Raspberries	247,970	60,001	307,971	223,000	32,250	255,250
Loganberries	138,129	19,001	157,130	49,890	1,395	51,285
Strawberries	6,972,270	405,759	7,378,029	6,877,500	686,250	7,563,750
Gooseberries	51,762	8,480	60,242	40,500	9,000	49,500
Youngberries	127,304	21,600	148,904	79,489	9,532	89,021
Other Berries	45,906	12,610	58,516	19,737	2,127	21,864
Olives	60,351	56,568	116,919	73,931	53,660	127,591
Passion-fruit	15,950	8,085	24,035	9,011	3,657	12,668
Almonds	26,496	4,576	31,072	23,568	3,247	26,815
Walnuts	6,549	2,094	8,643	6,134	1,054	7,188
Filberts	3,725	458	4,183	5,592	120	5,712

The distribution of the fruit industry over the State is set out in the following table, where the number of trees of each kind in each statistical district is given for the season 1961-62 :—

VICTORIA—NUMBER OF FRUIT TREES, PLANTS, ETC.,
SEASON 1961-62

Particulars	Statistical District								Total
	Central	North-Central	West-ern	Wim-mera	Mallee	North-ern	North-East-ern	Gipps-land	
Growers .. No.	1,821	157	91	129	1,273	1,030	136	63	4,700
Area acres	23,564	2,617	685	3,922	7,455	32,402	1,613	454	72,712
Apples trees	1,567,287	189,503	59,602	18,913	17,484	219,060	90,102	34,082	2,196,033
Pears "	244,416	73,072	1,103	8,431	3,893	1,403,147	1,009	2,314	1,737,385
Peaches "	234,479	2,421	386	19,142	35,609	1,180,828	2,000	1,444	1,476,309
Apricots "	45,124	634	1,023	13,915	61,937	261,611	672	736	385,652
Plums "	88,295	5,482	825	3,275	23,519	61,492	1,956	653	185,497
Prunes "	1,629	2	863	14,908	10,238	7,889	22	14	35,565
Cherries "	153,147	5,066	50	1,312	477	13,934	6,960	1,459	182,405
Quinces "	7,272	260	65	612	525	4,778	23	45	13,580
Nectarines "	12,291	90	84	208	8,197	4,059	310	232	25,471
Figs "	1,231	8	31	310	370	2,224	513	9	4,696
Olive "	335	..	2	103,280	21,002	1,656	1,316	..	127,591
Oranges "	807	2	3	148	415,759	137,616	1,817	17	556,169
Mandarins "	404	..	..	6	33,801	2,329	46	..	36,193
Grapefruit "	70,478	68	3	25	19,376	6,563	187	3	26,561
Lemons and Limes "	3,275	..	19	217	15,154	21,301	166	85	107,488
Passion-fruit .. vines	7,485,000	..	41	27	1,036	1,449	6,138	702	12,668
Strawberries .. plants	252,750	3,750	3,750	3,750	33,750	3,750	22,500	7,500	7,563,750
Raspberries .. bushes	51,085	500	..	..	2,000	..	..	..	255,250
Loganberries "	45,900	1,200	..	200	..	..	..	..	51,285
Gooseberries "	88,867	..	..	2,400	..	..	..	..	49,500
Youngberries "	21,864	..	..	..	..	154	..	..	89,021
Other Berries "	626	30	13	2,032	11,094	7,054	5,937	29	21,864
Almonds trees	308	41	15	63	625	207	5,135	794	26,815
Walnuts "	135	..	..	..	112	..	5,461	4	7,188
Filberts .. .. "	..	..	..	..	..	..	..	..	5,712

Cool Storage

The fruit industry has been well aware of the importance of refrigeration since the end of the last century. Before the First World War several co-operative and privately owned cool stores had been built, beside the first Government Cool Stores, at Flinders Street, Melbourne. The Government also built and operated five further stores situated in the fruit growing districts close to Melbourne. These have been gradually handed over to growers' co-operatives.

The extension of electric power to rural areas throughout the State has resulted in the construction of numerous small private cool stores. More efficient refrigeration techniques and insulating materials have also helped to spread the idea of cool storage. Since the Second World War there has been a rapid increase of cool store capacity in Victoria, mainly because of the very rapid development of small cool stores built in individual orchards as illustrated by the following table on page 516 :—

VICTORIA—FRUIT GROWERS' COOL STORES, 1948–1963

Year	Number	Capacity
1948	72	'000 bushels 600
1958	218	1,500
1961	311	1,800
1963	357	2,600

Including co-operative and proprietary stores, the total for 1963 is 432 stores with a capacity of 5·8 mill. bushels.

Many of the small orchard cool stores are used to pre-cool highly perishable soft fruits (apricots, peaches, plums and berries) and tomatoes before they are forwarded to Melbourne or interstate markets. These fruits ripen in the summer and at high summer temperatures often become over-ripe and worthless in the interval between picking and marketing, unless pre-cooled at the orchard within a few hours of picking.

Most of the orchard cool stores situated within 50 miles of Melbourne are used together with the larger co-operative and proprietary stores to achieve a more gradual marketing of Victoria's apple and pear crop. This supply of good quality fruit from store at regular intervals for a period of 6–9 months calls for considerable skill and knowledge. The fruit picked is still alive and it continues its living processes for a certain time, influenced by the variety, its ripeness at the time of harvesting ("picking maturity"), interval between harvesting and beginning of cool storage, temperature and humidity of cool chambers, and other factors. Cool storage behaviour of the fruit and the type of storage provided are also of great importance with the fruit exported to oversea markets.

To assist the industry with cool storage research, Experimental Cool Chambers were set up at the Government Cool Stores, Victoria Dock in 1923. In 1956 these were transferred to the Scoresby Horticultural Research Station, where large and better experimental chambers were constructed for this purpose.

Vine Fruits

Most vine fruits grown in Victoria are marketed as dried fruits (currants, sultanas, and raisins). Smaller quantities are sold as fresh fruit or are used for wine production. Some 40,000 acres of vines are grown in the irrigated districts of the River Murray at Mildura, Robinvale and Swan Hill. The climate at Mildura and Robinvale provides the high temperatures and clear sunny conditions during the growing season and drying period which are essential for the production of first quality dried fruit. The Swan Hill district with slightly lower temperatures and higher rainfall is less suitable than Robinvale and Mildura.

After dipping and sun drying by the grower, the dried fruit is processed and packed in packing houses. The production of dried fruits in Victoria for season 1963-64 amounted to 60,021 tons of sultanas, 3,939 tons of currants, and 6,118 tons of raisins. Approximately 70 per cent. of this produce was exported to the United Kingdom, Canada, and New Zealand.

During recent years the growing of grapes for table use has expanded rapidly and with some growers has become a specialized industry. The main varieties are Waltham Cross, Purple Cornichon, Ohanez, Sultanas, and Muscats. Melbourne and Sydney are the main market outlets, but Indonesia, Colombo, and Singapore may grow in importance as export markets.

Grapes are grown specifically for wine production at Rutherglen, Great Western, and Nagambie. While the wine growing area around Rutherglen is gradually declining, increasing quantities of grapes for winemaking are produced in the River Murray Irrigation districts. In 1963-64, 3.7 mill. gall. of wine were produced.

Grapes for Wine, 1964

Particulars of vine production for the five seasons 1959-60 to 1963-64 are given in the following table :—

VICTORIA—VINE-FRUIT PRODUCTION

Season	Number of Growers	Area		Production					
		Bearing	Not Bearing	Grapes Gathered	Wine Made	Dried Fruits			
						Raisins	Sultanas	Currants	
		acres		'000 cwt.	'000 gall.	cwt.			
1959-60 ..	2,505	42,244	1,885	4,229	2,147	122,258	773,035	66,615	
1960-61 ..	2,524	42,688	1,961	5,017	3,021	105,552	914,492	111,660	
1961-62 ..	2,526	42,540	2,565	5,902	3,605	122,730	1,174,494	54,290	
1962-63 ..	2,547	42,734	2,928	4,271	2,433	94,777	786,410	50,728	
1963-64 ..	2,583	43,485	3,016	6,274	3,705	122,352	1,200,415	78,676	

Vegetables

The climate of Victoria is such that practically every kind of vegetable can be grown in some part of the State during the favourable season in each area. Consequently, there is a plentiful supply of fresh vegetables on the market for the whole year in normal years. These vegetables (excluding potatoes and onions) worth about \$17 mill. each year to Victoria are harvested from about 40,000 acres.

Over half the area under vegetables is situated close to Melbourne. Other vegetable producing centres south of the Dividing Range are in the Western District (the centre of processed pea production) and in Gippsland (the centre of the stringless bean growing industry for processing and also for seed bean production). These areas are fairly

free of frosts and have a well distributed rainfall ranging from 20 to 35 inches. Vegetables are grown on a wide variety of soils (sand, sandy loam, clay loam, peat, and volcanic). Many market gardeners use irrigation from town water supplies, storage catchments, streams, and dams to supplement summer rains.

North of the Dividing Range the summer is longer and hotter, but winter frosts are more frequent. Many areas along the Murray are ideal for growing early spring crops. In many instances intercropping in orchards and vineyards is practised. Efficient transport enables the shipping of the products to both the Melbourne and the Sydney markets. In the Goulburn Valley and around Bendigo tomato production for processing is concentrated. The greatest part of the Victorian crop, which is almost half of the total Australian production, comes from this area.

Returns from market gardening can fluctuate greatly according to weather and market conditions, and production methods have to be highly efficient. Besides using the dwindling supplies of animal manure, a large amount of artificial fertilizer is used (6-12 cwt. per acre). There is an increasing tendency towards mechanization (spraying units for pest and weed control, vining units for harvesting of peas and beans). While most crops reach the consumers as fresh vegetables, a considerable amount is processed.

Details of the area, production, and gross value of vegetables are given in the table below for all the more important types, except potatoes and onions which are shown under separate headings on pages 509 and 510 :—

VICTORIA—VEGETABLES FOR HUMAN CONSUMPTION,
1963-64

Type	Area Sown	Production	Gross Value
	acres	tons	\$'000
Carrots	1,862	23,019	2,565
Parsnips	624	6,336	941
Beetroot	416	3,790	412
Tomatoes	4,466	58,637	2,492
French Beans	2,787	4,936	493
Green Peas—			
Sold in Pod	8,286	9,470	1,262
Canning	9,536	12,464*	387
Cabbages	2,060	24,191	1,305
Cauliflowers	2,970	34,483	2,409
Brussels Sprouts	760	2,640	794
Lettuce	2,335	7,809	1,511
Pumpkins	1,858	9,991	662
Other Vegetables	3,408	15,169	1,841
Total	41,368	212,935	17,075

* Pod equivalent.

Minor Crops

There are other crops cultivated in Victoria in addition to those enumerated on pages 496 to 498. The most important of these are nursery products, cut flowers, Japanese millet, sunflowers, agricultural seeds, and vegetable seeds.

Pastoral and Dairying*Progress of Stock Breeding in Victoria*

The first great development in Victoria, or as it was then known, the district of Port Phillip, was the pastoral interest. Millions of acres of lightly timbered land lay at the feet of the newcomers, and the quickest way to wealth was evidently by the division of the land into runs and the depasturing of sheep and cattle. Settlers and stock, at first from Tasmania and eventually from New South Wales, came from the very first year of discovery.

According to early statistical records, there were 26,000 sheep, 100 cattle, and 57 horses in the Colony on the 25th May, 1836. On the 1st January, 1841, as a result of five years of livestock importation and breeding, there were 782,283 sheep, 50,837 cattle, and 2,372 horses. By 1st January, 1851, the livestock population had increased to 6,032,783 sheep, 378,806 cattle, 21,219 horses, and 9,260 pigs.

The following table shows the number of livestock in Victoria at decennial intervals since 1861 to 1951 and the number of livestock on rural holdings for each of the five years 1960 to 1964. As from 1957 no allowance has been made for the small number of livestock not on rural holdings.

VICTORIA—LIVESTOCK
(‘000)

Year	Horses (Including Foals)	Cattle*		Sheep	Pigs
		Dairy	Beef		
1861 at 31st March ..	77		722	5,781	61
1871 " " ..	167		721	10,762	131
1881 " " ..	276		1,286	10,360	242
1891 " " ..	436		1,783	12,693	282
1901 " " ..	392		1,602	10,842	350
1911 at 1st March ..	472		1,548	12,883	333
1921 " " ..	488		1,575	12,171	175
1931 " " ..	380		1,430	16,478	281
1941 " " ..	318		1,922	20,412	398
1951 at 31st March ..	186	1,489	727	20,012	237
1960 " " ..	68	1,652	937	26,542	280
1961 " " ..	64	1,717	1,147	26,620	319
1962 " " ..	62	1,824	1,332	27,533	325
1963 " " ..	58	1,858	1,367	27,472	298
1964 " " ..	56		3,301	28,413	322

* Separate figures for beef and dairy cattle are not available for years prior to 1942-43 or for 1963-64.

A table showing the sizes of holdings and the numbers of holdings depasturing stock at March, 1960, appears on page 491. Dot maps

showing the distribution of livestock on rural holdings in Victoria at 31st March, 1962, appear on pages 577 to 580 of the Victorian Year Book 1964.

Changing Patterns in Animal Husbandry, 1963

Following an investigation into the adequacy of the wording and layout of the cattle sections of the Agricultural, Dairying, and Pastoral Statistics form, changes were introduced to the 1963-64 form.

Prior to 1964, farmers were asked to classify their herds as either "beef cattle" or "dairy cattle". As these two terms tended to confuse breed and purpose, farmers were asked in the new layout to classify their cattle, with the exception of bulls, according to the two main purposes of (i) milk production and (ii) meat production, irrespective of breed, and to report separately the number of cows and heifers kept for their own domestic milk supply; bulls were to be reported according to their breed and age, i.e., dairy or beef and over or under one year of age. Consequently, detailed statistics of cattle for 1964, set out in the following table, are not comparable with those for earlier years:—

VICTORIA—DISTRIBUTION OF LIVESTOCK, MARCH, 1964 (’000)

Particulars	Statistical District								Total
	Central	North-Central	West-ern	Wim-mera	Mallee	North-ern	North-East-ern	Gipps-land	
Horses	12	4	13	3	2	8	6	7	56
Cattle—									
Bulls for Service—									
Bulls, 1 Year and over—									
Dairy Breeds ..	6	1	9	1	1	8	3	10	40
Beef Breeds ..	5	2	9	1	1	4	5	5	32
Bull Calves—Under 1 Year—									
Dairy Breeds	3	1	3	1	1	3	1	4	16
Beef Breeds ..	2	1	4	1	*	2	2	2	14
Cows and Heifers for Milk and Cream—									
Cows in Milk	144	14	172	8	11	205	43	281	879
Cows Dry ..	46	8	104	6	4	33	48	57	306
Heifers—1 Year and over ..	45	6	72	4	4	67	26	76	300
Heifer Calves—Under 1 Year	45	7	68	5	4	71	26	81	307
House Cows and Heifers	5	2	6	5	3	5	3	3	34
Other Cattle and Calves for Meat Production—									
Cows and Heifers	101	37	203	20	13	64	115	119	672
Calves—Under 1 Year ..	63	25	109	15	11	54	78	82	437
Other	38	18	56	7	5	37	49	55	265
Total Cattle ..	504	122	815	74	58	554	398	775	3,301
Pigs	58	10	31	14	16	95	33	66	322
Sheep	2,505	2,220	9,845	4,388	1,817	4,046	1,969	1,623	28,413

* More than nil but less than half the final digit shown.

Fodder Conservation

The intensification of fodder conservation has been a natural development in farm management following pasture improvement and increased capacity for the carrying of livestock.

Even the best pastures do not provide a full ration for grazing animals throughout the year and, in addition, droughts and other circumstances, such as floods or fires, have serious effects on the amount of grazing available. In most cases, these periods of feed shortage must be met by fodder conservation and hand feeding. Fodder conservation is therefore a highly important farm activity without which stable livestock production at high levels could not be maintained.

In Victoria, meadow hay is now the main fodder crop conserved. Mechanization has removed the necessity for storage of large quantities of cereal hay in the wheatgrowing districts, and this is reflected in the decline in oaten hay production. Considerable quantities of lucerne hay are conserved, and oat grain, which is easily stored and transported, is still an important livestock fodder. Although there has been a spectacular increase in the amount of silage made, it occupies only a relatively minor position in the fodder conservation of the State.

Most hay in Victoria is made with the mower, side-delivery rake, and pick-up baler. About one in eight farms has a baler. After mowing, the crop dries for a time in the swath, and is then raked for further drying in the windrow before it is baled. Some farmers are using systems of loose hay handling and self-feeding based on simple low cost equipment, especially in northern areas or where short-term storage of hay is involved for early feeding needs.

Sometimes baled hay intended for summer or early autumn feeding is left in the paddock for self-feeding by the stock. Provided the hay is well made and, preferably, stored in stooks, there is little wastage in such temporary storage, especially if feeding is controlled. Long-term storage requires adequate protection, such as is given by a well constructed shed.

There is much interest at present in new machines and techniques aimed at faster drying of hay. This is a most significant development, since it makes possible further increases in hay production and also the production of better quality hay.

Most silage is made in open stacks using a mower and buckrake. This is simple, but wastage is high. The flail-type forage harvester has become popular because of its simple cutting action and relative cheapness. It consists of swinging blades which rotate at high speed on a horizontal shaft. It cuts the crop by impact and throws or blows it into an accompanying trailer or truck for transport for storage.

Fodder conservation has stimulated the productivity of Victorian farms, and has resulted in more efficient utilization of the extra herbage grown as the result of pasture improvement in all districts. In this regard, the contribution of mechanization to the livestock industry has already been notable, but there is still a great challenge in the years ahead. The potential for increased livestock production is continually being raised, but how much of it can be realized will depend largely on effective mechanization and organization on the farms.

Large numbers of livestock are now being maintained with increasing safety, but more conservation is still needed to avoid costly losses in the event of a widespread or extended drought.

Further References, 1963, 1964

Dairying Industry

Though faced with the long-term prospect of expanding local markets, both for liquid milk and for dairy products, as the population of this country increases, the Australian dairying industry at present experiences varying fortunes according to the demand in overseas markets and the supply from other countries. In Victoria, however, the demand for good dairying land remains keen.

There is some tendency to sustain competitive land prices by increasing the output of milk or butterfat up to the point at which the farm business gives a satisfactory return. Until the middle of the 1930's, 30-cow hand-milked herds were common, and three milkers were usually needed to milk a herd of this size. In the next decade the introduction of milking machines made it possible for two people to milk 30 to 40 cows. In the late 1940's, dairy farmers in large numbers gave up hand-stripping after machines, and one man could then comfortably milk 40 to 45 cows. Doubling up of machine units also made the task easier. In the past four years the introduction of the herringbone-type milking shed has made it possible for one man to milk up to 60 cows and for two men to milk 80 or more.

Pasture improvement has been the basis of the increased carrying capacity of many farms. In some places potash fertilizers and trace elements have played their part; in others, the use of more superphosphate and better management and grazing of the pastures have sufficed.

With this increase of production has come a greater need to produce and conserve feed to be used at times when pasture production is slack. This is especially true on farms which supply market milk, as they must fulfil a contract every day of the year. Silage making on dairy farms has increased eightfold in recent years, and is still being taken up by more farmers. More crops are grown to fill the summer and winter feed gaps, and some have resorted to water harvesting and spray irrigation to provide green pasture in summer. Light tractors with hydraulic three-point linkage have brought with them the tendency to rely on machinery in preference to employing labour.

Advisory services given by the Department of Agriculture through dairy supervisors, the bi-monthly "Dairyfarming Digest", and other media, have made dairy farmers more conscious of their need to give thought to every side of farm management. More cows are under test than ever before in Victoria. Many artificial breeding groups have been formed, and a co-operative society now conducts the bull farm on which the semen is produced. There has been increased interest in milking methods, milking machine efficiency, and in the use of new and improved dairy detergents.

Refrigeration of milk on the farm and its collection from bulk vats by road tanker have been proved practicable in some districts, and these practices are now being adopted in other areas.

Local markets are changing. More and more country towns are being provided with supplies of pasteurized bottled milk, and the Milk Board has brought several country areas under its jurisdiction. In manufacturing, the trend is towards large versatile factories equipped

to change from one type of product to another, according to market prospects. There is a growing local market for various types of cheeses hitherto little known in this country, and cheddar cheese is now exported in blocks wrapped in plastic film. These have several advantages over the traditional cylindrical bandaged cheeses.

The research projects now being financed by the industry levy for research and promotion should benefit the dairying industry greatly in the coming years.

Victoria is the principal milk producing State and in 1963-64 the Victorian output (690 mill. gall.) represented 46 per cent. of the Australian production.

The following table shows the numbers of cow-keepers and cows, the estimated total production of milk, and the gross value of dairy produce for each of the last five years :—

VICTORIA—DAIRYING

At 31st March—	Number of Cow-keepers	Number of Dairy Cows	Estimated Total Production of Milk for All Purposes (Year Ended 30th June)	Gross Value of Dairy Produce*
		'000	'000 gall.	\$'000
1960	44,124	1,196	598,323	140,942
1961	43,690	1,197	596,706	144,008
1962	43,113	1,264	642,055	143,176
1963	41,866	1,294	670,788	157,136
1964†	28,181	1,184	689,881	172,560

* Includes subsidy.

† Details of cow-keepers and dairy cows for 1964 are not comparable with those for earlier years. Prior to 1964 these statistics were based on numbers of cows (in milk or dry) and springing heifers and included cows kept for the farmer's own domestic milk supply. Commencing with 1964, details of cows kept for the farmer's own domestic milk supply have been excluded. See page 520.

The quantities of butter, cheese, condensed and powdered full-cream milk, and casein produced during the last five years were as follows :—

VICTORIA—BUTTER, CHEESE, CONDENSED AND POWDERED MILK, AND CASEIN MADE

('000 lb.)

Year Ended 30th June—	Butter*	Cheese*	Condensed Milk	Powdered Full-Cream Milk	Casein
1960	201,394	43,152	99,063	23,822	19,181
1961	201,447	44,799	87,321	22,396	22,576
1962	215,328	53,633	88,178	23,745	27,362
1963	228,167	57,468	104,518	20,635	32,907
1964	228,541	56,446	129,081	22,328	33,591

* Including that made on farms.

The following table shows the number of dairy herds in Victoria, grouped, according to the number of cows, for each of the five years 1960 to 1964 :—

VICTORIA—DAIRY HERDS, CONTAINING FIVE COWS OR MORE, GROUPED ACCORDING TO SIZE

At 31st March—	Number of Herds—							Total
	5 to 9 Cows	10 to 14 Cows	15 to 19 Cows	20 to 29 Cows	30 to 49 Cows	50 to 99 Cows	100 Cows and over	
1960.. ..	4,304	2,262	1,682	2,971	6,155	8,488	1,397	27,259
1961.. ..	4,213	2,149	1,545	2,738	5,915	8,723	1,549	26,832
1962.. ..	4,092	2,064	1,454	2,712	5,667	9,271	1,838	27,098
1963.. ..	3,660	1,904	1,405	2,537	5,486	9,569	2,015	26,576
1964* ..	2,459	1,596	1,183	2,507	5,660	9,339	1,646	24,390

* Details for 1964 are not comparable with those for earlier years. See footnote to the first table on page 523.

Eradication of Tuberculosis, 1962

Pig Industry

Between 20,000 and 25,000 tons of pig carcasses are produced in Victoria in a year. Most of them are consumed here. Only a few are exported to other countries. About half the pig meat is used as fresh pork or for sausages and other meat products. The other half is made into bacon and ham, some of which is canned. Victoria is usually a net importer of pig meat from other States of Australia.

Farmers sell pigs to meat works either directly or through public auction sales. There are adequate facilities for selling pigs in most districts. Pigs are sold for meat as porkers about 4 to 5 months old and yielding dressed carcasses of 60 lb. to 100 lb.; as baconers, 5 to 7 months old and with dressed carcasses of 120 lb. to 160 lb.; or as backfatters, yielding carcasses of 200 lb. to 500 lb. after having been discarded from the breeding herd.

Most of the pigs in Victoria are in small herds on dairy farms and mixed farms. The sizes of the herds are related to the quantities of separated milk and other food by-products of the farms. A food supply which is adequate in quality, quantity, and cost is the basis of economic pig production. There are few specialized pig farms in Victoria. Their main food supplies are buttermilk and whey from dairy produce factories, and food refuse from eating places and food factories.

Pig prices vary and farmers have practically no control over them. Prices are usually higher in spring, when there are fewer pigs in the market, than in autumn when there are more pigs. Seasonal fluctuation in the quantities of milk available for pig feeding is the usual cause of fluctuating supplies of pigs to markets.

Another cause of fluctuation in production and prices of pigs, not so regular but sometimes big enough to cancel the seasonal one, is due to big increases or decreases in pig breeding. As three-quarters of the pig breeders in Victoria have an average of less than three breeding sows each, an addition of one more sow when prices are favourable results in a substantial over-all increase.

The number of pigs in Victoria at 31st March, 1964, was 322,051. About 77 per cent. of these are held in the Central, Western, Northern, and Gippsland districts which are so largely devoted to dairying. The following table shows classifications (in statistical districts) of pigs, together with the numbers of pig-keepers :—

VICTORIA—PIGS AND PIG-KEEPERS, 31ST MARCH, 1964

Statistical District	Boars	Breeding Sows	All Other	Total Pigs	Pig Keepers
Central	1,085	9,045	47,453	57,583	1,265
North-Central	254	1,617	8,274	10,145	431
Western	843	5,530	25,055	31,428	1,195
Wimmera	429	2,334	11,069	13,832	889
Mallee	456	2,741	12,644	15,841	806
Northern	1,853	15,428	77,381	94,662	1,860
North-Eastern	924	5,924	25,961	32,809	1,114
Gippsland	1,488	10,667	53,596	65,751	1,691
Total	7,332	53,286	261,433	322,051	9,251*

* Of this number 1,979 had herds of under 5 pigs ; 1,143 herds of 5 and under 10 ; 1,669 herds of 10 and under 20 ; and 4,460 herds of 20 pigs and over.

The following table shows the latest statistics available of the number of dairy herds (in size groups) separated into those where pigs are held, and those where no pigs are held. The sizes of pig herds are also shown.

VICTORIA—PIG-KEEPING IN CONJUNCTION WITH DAIRYING : NUMBER OF HOLDINGS AT MARCH, 1960

Size of Dairy Cattle Herd (Numbers)	Size of Pig Herd (Numbers)								Holdings with Pigs	Holdings with No Pigs	Holdings with Dairy Cattle
	1-4	5-9	10-14	15-19	20-29	30-49	50-99	100 and over			
1-4	526	119	71	44	49	55	42	31	937	12,351	13,288
5-9	481	136	64	45	50	58	33	11	878	4,786	5,664
10-14	279	122	70	24	35	32	14	7	583	2,113	2,696
15-19	169	83	57	23	40	24	10	2	408	1,301	1,709
20-29	255	164	121	61	93	60	23	14	791	1,946	2,737
30-49	330	339	255	169	240	172	53	14	1,572	3,176	4,748
50-69	179	261	261	192	328	298	100	15	1,634	2,976	4,610
70-99	118	142	165	151	320	490	266	30	1,682	3,747	5,429
100-149	42	75	55	64	171	300	288	73	1,068	2,050	3,118
150 and over	9	7	14	14	26	78	114	66	328	629	957
Total	2,388	1,448	1,133	787	1,352	1,567	943	263	9,881	35,075	44,956

Sheep Industry

Breeds of Sheep

Victoria and Tasmania are the only two Australian States in which the Merino does not comprise over 50 per cent. of the sheep population. In 1962, Victoria's sheep population consisted of 44 per cent. Merinos ; 15 per cent. Corriedales ; 5 per cent. Polwarths ; 30 per cent. Comebacks and Crossbreds ; and 6 per cent. British breeds (mainly pure Dorset Horn, Romney Marsh, Border Leicester, and Southdown).

The Corriedale and the Polwarth were both developed in Victoria to meet a special need in the southern high rainfall area for a dual purpose which combined the production of good style comeback or crossbred wools with good meat conformation. The pure British breeds are mostly run in small stud flocks which produce rams for use in cross breeding for prime lamb or crossbred wool production.

Some common crosses used in fine crossbred and comeback wool production are Merino by Corriedale, Merino by Polwarth, and Corriedale by Polwarth. The common crosses used to produce strong Crossbreds for wool and prime lamb production are Border Leicester by Merino, Romney Marsh by Corriedale, and Romney Marsh by Merino.

The most important breeds for siring prime lambs are the Dorset Horn (and the Poll Dorset), the Southdown, and the Border Leicester.

Information on the number of sheep of each breed is collected triennially.

The following table shows the breeds of sheep in Victoria (by statistical districts) at 31st March, 1962 :—

VICTORIA—BREEDS OF SHEEP (INCLUDING RAMS),
31ST MARCH, 1962
(’000)

Statistical District	Merino	Corriedale	Polwarth	Dorset Horn	Romney Marsh	Border Leicester	South-down	Merino Comeback	Crossbred	Other	Total
Central ..	515	385	191	70	43	36	38	217	724	17	2,237
North-Central ..	967	281	37	48	10	37	30	243	425	14	2,093
Western ..	4,428	1,925	839	91	360	48	35	1,029	901	32	9,688
Wimmera ..	3,134	458	27	44	29	34	1	163	387	12	4,288
Mallee ..	723	163	12	48	4	55	*	220	638	4	1,868
Northern ..	1,172	431	38	143	14	126	36	315	1,627	30	3,932
North-Eastern ..	565	225	80	34	23	34	11	185	689	14	1,860
Gippsland ..	610	142	23	42	25	27	20	197	466	15	1,566
Total ..	12,115	4,009	1,247	519	507	397	171	2,571	5,857	138	27,533

* More than nil but less than half the final digit shown.

Information on the number of rams of each breed is collected annually. The following table shows the breeds of rams in Victoria (by statistical districts) at 31st March, 1964 :—

VICTORIA—BREEDS OF RAMS, 31ST MARCH, 1964

Statistical District	Merino	Corriedale	Polwarth	Dorset Horn	Border Leicester	South-down	Other	Total
Central	4,105	4,550	1,938	8,788	1,429	5,141	3,772	29,723
North-Central	7,620	3,106	521	5,024	2,775	2,721	1,941	23,708
Western	51,909	24,100	11,453	7,917	2,162	4,244	14,491	116,276
Wimmera	26,721	6,397	304	4,951	4,084	170	2,138	44,765
Mallee	3,909	1,510	67	8,159	7,670	95	1,634	23,044
Northern	10,144	4,602	478	24,431	11,745	2,953	3,352	57,705
North-Eastern	4,412	2,331	875	8,151	3,772	1,997	3,457	24,995
Gippsland	4,263	1,546	203	3,539	1,893	2,740	3,645	17,829
Total	113,083	48,142	15,839	70,960	35,530	20,061	34,430	338,045

The numbers of sheep in Victoria in selected years since 1861 are shown in the table on page 519. The distribution of all livestock is shown in the table on page 520.

Factors such as seasonal conditions, prices of wool, mutton, lamb, and to a lesser degree, wheat, affect the number of sheep in the State in any given year. In an adverse season flocks may be reduced by mortality due to lack of fodder or water, by the increase in the slaughtering of fat stock, or by the decrease in lambing. Decreased imports from other States are another factor. In addition to the seasonal movements of sheep from New South Wales and South Australia for agistment, there is a regular importation of sheep from those States for slaughtering purposes.

Lambing

Climatic conditions also play a large part in determining the proportion of lambs dropped to ewes mated, and thus the natural increase from season to season may vary considerably. The following table shows the number of ewes mated or intended to be mated, the number actually mated, and lambs marked, in each of the five seasons 1960 to 1964 :—

VICTORIA—LAMBING

Season	Ewes Intended for Mating	Ewes Actually Mated	Lambs Marked	Proportion of Lambs Marked to Ewes Mated
1960	10,837	10,614	8,630	81
1961	11,516	11,440	9,773	85
1962	11,409	11,008	9,217	84
1963	11,436	11,369	9,795	86
1964	11,633	11,611	9,853	85

Sheep and Lambs in Statistical Districts

The following tables set out the number of rams, ewes, wethers, and lambs depastured in each statistical district of the State at 31st March, 1964, and the numbers of ewes mated classified according to whether the progeny is intended for wool, or for fat lamb production:—

VICTORIA—SHEEP AND LAMBS IN EACH STATISTICAL DISTRICT AT 31ST MARCH, 1964
(’000)

Particulars	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	North-ern	North-Eastern	Gipps-land	
Rams ..	30	24	116	45	23	58	25	18	338
Breeding Ewes*	1,092	862	3,977	1,658	1,067	2,190	982	738	12,566
Other Ewes ..	79	62	518	188	20	76	46	44	1,033
Wethers ..	814	878	3,043	1,576	266	846	533	464	8,420
Lambs ..	490	395	2,191	921	441	877	383	358	6,056
Total Sheep and Lambs ..	2,505	2,220	9,845	4,389	1,817	4,046	1,969	1,622	28,413

* Includes breeding ewes not mated (932,858 at 31st March, 1964).

VICTORIA—LAMBING, 1963 SEASON

Particulars	Statistical District								Total
	Central	North-Central	Western	Wimmera	Mallee	North-ern	North-Eastern	Gipps-land	
Ewes Mated '000 ..	974	794	3,472	1,479	977	2,113	921	639	11,369
Lambs Marked '000 ..	894	689	2,909	1,205	833	1,885	791	590	9,795
Percentage ..	92	87	84	81	85	89	86	92	86

VICTORIA—LAMBING FORECAST, 1964 SEASON
(As Advised by Farmers at 31st March, 1964)
(’000)

Breed of Rams Used	Ewes Mated or Intended to be Mated (For Lambing during 1964 Season)								Total
	Statistical District								
	Central	North-Central	Western	Wimmera	Mallee	North-ern	North-Eastern	Gipps-land	
Merino ..	159	267	1,439	885	156	330	180	184	3,600
Corriedale or Polwarth ..	200	115	1,126	199	69	159	114	69	2,051
Shortwool Breeds ..	564	301	508	223	453	1,151	460	290	3,948
Longwool Breeds ..	94	124	455	202	363	464	181	150	2,034
Total ..	1,017	807	3,528	1,508	1,040	2,104	935	694	11,633

Sheep and Wool Growing Districts

Sheep are run in all parts of Victoria, except on some of the fringe country of the southern coast, and the heavily timbered mountainous country in the Eastern Highlands.

Central. This district has a wide range of environments which influence the type of enterprise. Prime lamb production is the main sheep enterprise, with some areas suited to late lamb production. Some attractive wools are also grown.

North-Central. Wool growing is important in this district, but the wool is generally not as attractive as that produced in the Western District because of more dust and seed. Prime lamb production is also important in the western part of the district. The ewes preferred are Corriedale or similar crossbred types.

Western. This district has one of the highest concentrations of sheep in the world. The climate is well suited to the production of the finest and most stylish wools, having a reliable annual rainfall of 20 to 30 inches, and relative freedom from dust. About half the sheep are Merinos with the remainder mainly Polwarths, Corriedales, or Comebacks. These sheep are raised almost exclusively for wool, producing one-third of Victoria's total wool clip.

Wimmera. In this district sheep are mainly raised in conjunction with wheat growing. In the southern part wool growing is the main pursuit with Merinos forming the majority; whereas in the northern part prime lamb raising is of greater importance, using mainly strong wool Merinos or crossbred ewes mated with Dorset Horn or Border Leicester rams. Dust and vegetable faults detract from the wools grown in this district.

Mallee. As in the Northern Wimmera, prime lamb raising in conjunction with wheat growing is the main sheep enterprise. Dust, sand and burr reduce the value of wool grown in this district. Sheep play an important role in the medic-ley and clover-ley systems of farming which have been introduced in recent years.

Northern. The wheat sheep enterprise again predominates in this district. Early prime lamb production is of major importance on the irrigation areas within this district. On the dry land areas, both prime lamb raising and the growing of coarser types of wool occur.

North-Eastern. This high rainfall area produces both attractive wool and prime lambs, the population being approximately one-third Merino and two-thirds crossbreds.

Gippsland. In the eastern part of this district Merinos, Comebacks and crossbred types are run mainly for wool, with prime lamb production in conjunction with dairying in the western areas. There is a potential for late lamb production in the higher rainfall area around Leongatha.

Wool Growing Districts, 1962

Production of Wool

Statistics of wool production are obtained direct from growers, from fellmongeries and, for wool exported on skins, from the Department of Customs and Excise.

VICTORIA—SHEEP AND LAMBS SHORN, SEASON 1963-64

Statistical District	Shorn		Wool Clipped (Including Crutchings)		Average	
	Sheep	Lambs	Sheep's	Lambs'	Per Sheep	Per Lamb
	'000		'000 lb.		lb.	
Central ..	2,143	544	22,174	1,577	10·35	2·90
North-Central ..	2,138	506	21,279	1,418	9·95	2·80
Western ..	9,269	2,444	90,496	6,548	9·76	2·68
Wimmera ..	4,140	1,021	44,236	2,788	10·69	2·73
Mallee ..	1,463	413	16,889	1,255	11·54	3·04
Northern ..	3,631	1,024	36,909	3,011	10·16	2·94
North-Eastern ..	1,836	443	17,008	1,144	9·26	2·58
Gippsland ..	1,390	441	13,481	1,122	9·71	2·54
Total ..	26,009	6,836	262,472	18,863	10·09	2·76

VICTORIA—SHEEP SHORN AND WOOL CLIPPED

Season	Shorn		Wool Clipped (Including Crutchings)		Average	
	Sheep	Lambs	Sheep's	Lambs'	Per Sheep	Per Lamb
	'000		'000 lb.		lb.	
1959-60 ..	25,393	6,823	255,341	18,621	10·06	2·73
1960-61 ..	24,999	5,822	255,915	17,222	10·24	2·96
1961-62 ..	25,664	6,847	261,012	19,994	10·17	2·92
1962-63 ..	25,376	6,235	243,238	17,561	9·59	2·82
1963-64 ..	26,009	6,836	262,472	18,863	10·09	2·76

VICTORIA—WOOL PRODUCTION AND VALUE

Season	Clip	Stripped from and Exported on Skins, &c. (Greasy)	Total Quantity (Greasy)	Gross Value	Average Price per lb.
					'000 lb.	$'000	cents
1959-60 ..	273,961	49,038	322,999	151,905	47·03
1960-61 ..	273,137	48,874	322,011	138,530	43·02
1961-62 ..	281,006	49,632	330,639	148,438	44·89
1962-63 ..	260,799	55,906	316,705	158,013	49·89
1963-64 ..	281,335	52,953	334,288	208,700	62·43

Wool Marketing System

The present system of wool marketing has been built up over more than a century by the efforts of many able and energetic leaders, notably Thomas Sutcliffe Mort who prompted the first Australian

auctions held at Sydney in 1843, and Richard Goldsbrough who started the sale of Victorian wool and produce in Melbourne in 1848. Geelong, the third Australian centre, was established in 1857.

On these foundations has been built a marketing system probably unique in world commerce, where a product is sold, in the presence of its grower, to the highest bidder amongst manufacturers and their agents from all over the world.

A sales programme, which ensures that there is a representative selection of wool to meet the varied demand at each centre covered by Victorian buyers, is prepared for the complete season. Thus, by controlling the amount of wool offered, an orderly marketing system is maintained.

Auction System

Under the auction system wools are displayed on the show floors of woolbrokers' stores, equipped with sawtooth roofs, giving clear, even lighting. This presentation of the wool under conditions which promote the interest of the grower, and at the same time retain the confidence of the buyer is the responsibility of the selling broker, and involves strict and thorough attention to detail.

The whole of the offering in each catalogue is valued by the brokers' experts, who keep in the closest touch with the market and its movements. When the auction begins, the auctioneer is accompanied by the wool expert who is able to protect the growers' interests. In this way, the grower exercises control up to the last moment, and may withdraw any lot if the bids do not conform to his ideas of value.

At the fall of the auctioneer's hammer, the ownership of the lot passes from the woolgrower to the woolbuyer, but the woolbroker still performs some service by storing it in his warehouse until it is required by the buyer. If the wool is to go overseas it is dumped, or compressed tightly and held by metal bands. The broker then has it delivered to the ship, or the local mill, and at that point marketing ends.

Further Reference, 1963

History of Pastoral Industry, 1963

Meat Industry

The farm lands of Victoria have proved most suitable for meat production and about 30 per cent. of Australia's red meat is produced in Victoria.

The American market has brought big changes to the beef industry, since the United States is mostly interested in lean meat. The demand created to supply this market has lifted the prices of bulls, dairy cows, and what are known to the trade as store cattle. The prices for these cattle have increased considerably and are now close to the prices per 100 lb. dressed weight (chilled carcass) of the traditionally prime cattle, used extensively in supplying the local trade.

The local market for lamb has always been good but the demand for export lambs has been irregular, largely because of overfatness. Grading is largely a matter of fatness and the leaner, meatier types used locally are the most profitable to produce in areas where the season

favours marketing from February to September. Marketing of lambs from the drier parts of the State has to be done during October, November, and December when, because of the large offerings, lamb prices are at export parity.

Boneless mutton exports to the United States have provided a large market for old sheep which at one time brought low prices for canning and small goods. There is still a proportion of old sheep allowed to die on properties but the waste has been greatly reduced in recent years and is reflected in greater mutton production.

There have been more pigs in Victoria than at present but, with faster growth and more rapid turnover, pig meat production has remained high. Most pig meats are consumed locally and a small increase in production is reflected in a big drop in prices and vice versa. Since prices improved following the almost complete cessation of exports during the Second World War, pig meat production has tended to follow three year cycles. For about eighteen months, pig prices are low and many farmers go out of production. Then there is a shortage of pig meats and prices rise, attracting new farmers into pig meat production. When these new farmers have pigs to sell, the shortage is overcome and prices fall. The successful pig farmer has a cheap supply of good food and produces steadily all the time.

The American influence upon Victoria's standards of living has had a telling impact on table poultry production. Fewer people are keeping poultry for their own domestic requirements, and consequently, more poultry meat is purchased. This has resulted in a big increase of broilers, capons, and other table fowl, including ducks and turkeys.

Stock Slaughtered

The following table shows the number of slaughtering establishments and details of the stock slaughtered in the State during each of the five years 1959-60 to 1963-64 :—

VICTORIA—STOCK SLAUGHTERED

Particulars	Stock Slaughtered in Establishments and on Farms and Stations				
	Year Ended 30th June—				
	1960	1961	1962	1963	1964*
	'000				
Sheep	7,623	6,374	7,389	7,444	7,306
Lambs	4,888	5,002	5,099	5,408	5,342
Bulls and Bullocks	215	165	263	310	292
Cows	367	267	356	463	509
Young Cattle	199	172	216	255	312
Calves	497	436	508	574	668
Pigs	458	514	588	530	533
	No.				
Number of Slaughter-houses	306	296	282	284	282

* Average dressed weights per carcass during 1963-64 were : Sheep 45.91 lb. ; Lambs 34.57 lb. ; Bulls and Bullocks 591.47 lb. ; Cows 421.65 lb. ; Young Cattle 295.92 lb. ; Calves 48.74 lb. ; Pigs 106.70 lb.

Frozen Meat Exported

The importance of the beef, mutton and lamb export trade is indicated by the export figures for the years 1959-60 to 1963-64 as shown in the table below. During 1963-64 the United States, the United Kingdom, Japan, and Canada continued to absorb the largest quantities of frozen meats exported from Victoria. In that year 88 per cent. (in value) of beef and veal exports from Victoria were consigned to the United States, while that country also took the largest share (39 per cent.) of mutton exports, followed by Japan (22 per cent.) and Canada (15 per cent.). The United Kingdom was most prominent as a buyer of frozen lamb (59 per cent. of Victorian exports).

FROZEN MEATS EXPORTED FROM VICTORIAN PORTS

Year Ended 30th June—	Mutton		Lamb		Beef and Veal	
	'000 lb.	\$'000	'000 lb.	\$'000	'000 lb.	\$'000
1960	47,512	6,406	29,440	4,072	63,081	17,598
1961	50,043	9,360	34,209	6,244	41,652	11,868
1962	76,284	11,276	18,022	2,384	81,085	21,290
1963	95,057	16,502	27,674	5,114	117,314	31,822
1964	104,409	16,591	20,877	3,658	122,323	33,637

Honey Industry

Victoria's hardwood forests each year provide an important contribution to the wealth of the State by virtue of timber production for various purposes. However, one little known facet of forest productivity is the annual harvest of honey and beeswax taken from many species of eucalypts in all parts of the State. Today, Victoria ranks second among the States in apicultural activities. Eucalyptus species provide the bulk of the honey crop—up to 95 per cent. of the total—with the balance made up of ground flora species such as clover and Patterson's Curse.

There are some 1,250 apiarists in Victoria with five or more hives. These apiarists produce an average of 8 mill. lb. of honey per annum. Hive yields are relatively good and range from 90 to 150 lb. per annum. The larger commercial outfits would average 200 lb. per annum.

The industry is, of necessity, migratory, whole apiaries with attendant plant being moved by road transport from one part of the State to another following the flowering of various species of honey flora in the forests and on the farm lands. Hives, trucks, and plant have been designed and modified to suit the requirements of mobility demanded by the industry.

Pollination of agricultural crops is a further aspect of the industry which has received considerable attention. Each year in the past, thousands of colonies have been hired out to fruit and seed growers to ensure profitable sets of seed and fruit. However, in recent years the

advent of the newer types of insecticides and their increasing popularity, especially with fruit growers, has caused concern amongst apiarists. Many of these are no longer prepared to lease hives of bees for pollination because of serious bee losses resulting from the spray application of certain insecticides. It is anticipated that, with the increasing use of some of these chemicals, pollination of agricultural crops may become a serious problem in Victoria and elsewhere.

Marketing has always been a great problem to the industry. Violent fluctuations in the annual honey crop are always, in the absence of any organized marketing scheme, attended by similar fluctuations in prices. Considerable carry-overs occasionally aggravate this. However, late in 1962 Federal Parliament passed enabling legislation for the establishment of the Commonwealth Honey Marketing Board. The functions of the Board are to regulate export of, and export prices for, honey. The activities of the Board are financed by means of a levy on domestic consumption of honey and a publicity and research programme is being undertaken.

State interest in the industry is authorized by the *Bees Act* 1958 and extends to disease control, advisory services, and research into the problems of the industry. An Apicultural Research Unit is in operation at the Scoresby Horticultural Research Station.

Particulars relating to apiculture for the five years 1960–1964 are given in the following table :—

VICTORIA—BEE-HIVES, HONEY, AND BEESWAX

Season Ended 31st May—	Beekeepers*	Hives	Production		Gross Value	
			Honey	Beeswax	Honey	Beeswax
	No.		lb.		\$	
1960 ..	1,217	104,767	9,660,937	113,526	1,198,960	58,182
1961 ..	1,184	105,685	8,389,817	104,690	1,048,728	52,346
1962 ..	1,276	103,216	10,314,129	135,218	1,181,792	67,610
1963 ..	1,280	100,787	4,818,300	63,906	582,148	32,618
1964 ..	1,247	93,424	9,460,126	110,363	1,497,854	56,562

* Apiarists with 20 hives and over numbered 818 in 1960, 822 in 1961, 830 in 1962, 821 in 1963, and 747 in 1964. Since 1958 the collection has excluded apiarists with less than five hives.

Primary Industries Other than Farming

Forestry

Forest Estate

Of the 56,245,760 acres in Victoria, the forest estate consists of 5,580,237 acres of reserved forest and over this area the Forests Commission has full control. Only a proportion of this reserved forest produces commercial timber, as large areas come within the category of protection forests and are of value in safeguarding the State's water catchments. In addition, the Forests Commission has partial control

over some 9 mill. acres of unoccupied Crown land which must, therefore, be included in the forest estate. These Crown lands include areas of Mallee scrub and alpine grass lands as well as good timbered country.

The Forests Commission of Victoria was established by the *Forests Act 1918* and consists of a chairman and two commissioners. Subject to the Forests Act, the Commission has the exclusive control and management of all matters of forest policy, the granting of leases, licences, permits and authorities, and the collection of rents, fees, royalties, and other revenue. It is the duty of the Commission to carry out plans and works for the establishment, maintenance, improvement, and renewal of natural forests and plantations of indigenous and exotic trees. It is also responsible for the prevention and suppression of fires, the training of forest officers, conduct of research work, provision of facilities for public recreation, and the protection of native flora and fauna in State forests.

Forest Timber

The following table summarizes the total output of all species for the years 1960 to 1964 :—

VICTORIA—FOREST TIMBER
(’000 Cubic Feet)

Item	Year Ended 30th June—				
	1960	1961	1962	1963	1964
Logs for sawing, peeling, slicing, or pulping—					
Hardwoods	67,546	63,779	60,789	66,910	67,371
Softwoods—					
Indigenous Forest Pines ..	152	217	205	*	13
Plantation Grown Pines ..	7,554	7,822	8,139	9,615	10,853
Total Logs ..	75,252	71,818	69,133	76,525	78,237
Hewn and Other Timber (Not Included above) Estimated Volume—					
Firewood †	37,924	43,767	37,539	33,557	35,335
Other §	5,274	4,956	4,676	4,152	4,684

* Output was only 524 cub. ft.

† Excludes mill waste used as firewood.

§ Includes telephone and electric supply transmission poles, bridge and wharf piles and beams, fencing timbers, railway sleepers and mining timbers from Crown lands. Similar information for private lands is not available.

Softwood Plantations

Experimental plantings of softwoods began in Victoria in 1880, and the first commercial plantations were established in 1910. In 1925, there were 4,555 acres of State plantations and the planting

programme then increased quite rapidly until by 1935 the area had increased to 38,360 acres. The main areas were at Bright, Ovens, and Stanley in the north-east, the Otways, and at Ballarat and Creswick. More recent extensions of State plantations have been in the south-west, north-east, and in the south Gippsland hills on abandoned settlement areas. The total area of State plantations at 30th December, 1964, was 59,714 acres. In 1961 an expanded planting programme commenced and the annual planting objective of 5,000 acres of softwood per year was reached in the 1964 planting season.

Pinus radiata has proved itself adaptable to all sites available, makes rapid growth, is hardy and relatively immune from insect and fungous attack, and produces a good quality utility timber. The area planted to *Pinus radiata* comprises 49,839 acres. Many of the areas originally planted with other conifers are now being converted to this species.

The older stands are principally 12 to 35 years old. Relatively small areas have been clear felled and either replanted or naturally regenerated, the bulk of the timber utilized to date being from thinnings in the form of logs for peeling and sawing, and pulpwood for paper manufacture.

The output from State plantations is summarized below :—

VICTORIA—OUTPUT OF SOFTWOOD LOGS AND
PULPWOOD

(’000 Cubic Feet)

Year Ended 30th June—	Sawlogs and Peeling Logs	Pulpwood
1960	2,129	1,143
1961	2,196	1,392
1962	2,659	1,527
1963	2,949	1,540
1964	3,274	1,385

During 1963–64 there was increased consumption of wood by industrial users in each of the three main industries of sawmilling, paper manufacturing, and building board production. Veneer manufacturers, who rely quite heavily on imports for their raw materials, also increased both the amount of locally grown timber that they used and its proportion of their total intake.

The increased consumption recorded above required increased output from both native forests of eucalypts and plantations of exotic conifers, mainly *Pinus Radiata*. It is noticeable that the proportion from the latter source continues to increase and is now about fourteen per cent. of the intake. Supplies were drawn from both State and privately owned plantations.

Firewood is no longer of any significance as an industrial fuel, and practically the whole of the volume reported was used in private houses.

Demand for timber for miscellaneous uses was well sustained, and rather more railway sleepers were cut than during the previous year. Markets for timbers in the round are dominated by the requirements of power transmission and telecommunications authorities whose main requirements are now for poles suitable for pressure impregnation with preservative materials. At present the process is being carried out at twenty-two plants in Victoria. The plants are also treating volumes of smaller round timber for use as shed poles, fence posts, and similar purposes. They use softwoods and the faster-growing non-durable hardwoods and provide a market for thinnings from both of these species groups.

Privately owned softwood plantations were estimated to comprise 83,674 acres at 30th June, 1964, and the areas are steadily increasing. Large industrial companies are planting *Pinus radiata* to provide sustained yields of softwood for sawmilling and wood-fibre industries. Private individuals plant small areas as long-term investments and many State schools maintain small endowment plantations.

The *Land (Plantation Areas) Act 1959* is designed to encourage private establishment of softwood plantations by providing that Crown lands suitable for commercial plantations and unsuitable for agriculture may, with certain safeguards, be leased for timber-growing purposes and subsequently sold to the lessee.

Fire Protection

Victoria is one of the most fire hazardous areas in the world. Disastrous fire seasons have occurred periodically since 1851.

The Forests Commission is responsible for the prevention and suppression of fires in all State forests and National Parks and in certain alienated lands within one mile of State forest or National Park. This area of responsibility is legally designated the Fire Protected Area.

The State is divided into seven Divisions, comprising 55 forest districts. The Commission maintains a radio laboratory and a fire equipment workshop.

Legislation provides strict control over the lighting of fires, power to prohibit the use of fire, and to close down certain operations in the Fire Protected Area during any period of extreme fire danger.

Further Reference, 1965

Telecommunications

The radio system consists of 40 base stations, 210 mobile sets in vehicles, 330 portable radios, and a central station in Melbourne. Nine automatic repeating stations have been installed to improve radio performance in difficult areas, and three mobile emergency stations are held for use at the base of operations of major fires. Four hundred and twelve miles of telephone lines erected by the Commission are maintained each year prior to the fire season.

Forest Fires

The causes of fires attended by Forests Commission personnel in the period 1959-60 to 1963-64 were as follows :—

VICTORIA—CAUSES OF FOREST FIRES

Cause	Number of Fires				
	1959-60	1960-61	1961-62	1962-63	1963-64
Grazing Interests	8	2	2	7	1
Landowners, Household, &c. ..	141	101	200	149	117
Deliberate Lighting	91	44	59	44	45
Sportsmen, Campers, Tourists ..	58	59	82	61	49
Licenses and Forest Workers ..	19	18	34	22	12
Smokers	65	59	44	33	87
Lightning	100	187	133	53	143
Tractors, Cars, Trucks, Locomotives, and Stationary Engines ..	33	47	30	26	37
Children	27	30	39	18	37
Sawmills	20	10	7	3	18
Miscellaneous Known Causes ..	107	80	94	22	85
Unknown Origin	59	25	60	43	39
Total	728	662	784	481	670

VICTORIA—AREAS OF STATE FOREST BURNT
(Acres)

Year Ended 30th June—	Commercial Area	Non-Commercial Area	Total
1960	135,583	1,065,850	1,201,433
1961	25,943	118,996	144,939
1962	59,348	108,024	167,372
1963	36,289	43,592	79,881
1964	16,620	274,820	291,440

Laboratory Research

Tests for viability, purity and dormancy of seeds of various soft-wood and hardwood species are being carried out.

Field Research

The factors affecting regeneration of a number of eucalypts, particularly *E. regnans*, *E. delegatensis*, *E. obliqua*, *E. nitens*, and *E. camaldulensis* are being studied by extensive field trials. Thinning trials in regrowth of ash species and mixed eucalypt have been established and are being regularly measured together with the significance of damage to crop trees during thinning.

Methods of direct seeding of eucalypt species and conifers are being investigated including trial sowings of *E. delegatensis* by aircraft.

Various pathological and entomological investigations are being carried out, including major attacks to control *Sirex noctilio*, the European horntail woodwasp which is a serious potential danger to softwood plantations, and a phasmatid or native stick insect which defoliates eucalypts.

There are also forest hydrology studies under way in relation to quality and quantity of water from forested water supply catchments.

Further Reference, 1965

Fisheries and Wildlife

General

Practical management of the fish and wildlife resources of Victoria is vested in the Department of Fisheries and Wildlife, which is responsible to the Chief Secretary for the administration of the Fisheries Act and the Game Acts, and for conservation, management, and research on native and introduced fishes, birds, and mammals.

The State Freshwater Fisheries Research Station and Native Fish Hatchery is located at Snobs Creek, near Eildon. A wildlife research centre is being developed at Lara, near Geelong. Fisheries and Wildlife Officers (enforcement staff) are stationed at eighteen district centres throughout the State, and eight more district stations are proposed.

Marine Fisheries

The Department's marine research activities are best considered as four separate programmes of which three are exclusively Victorian, while the fourth shares in a co-operative enterprise called the Southern Pelagic Project, involving all of the south-eastern Australian States, including Tasmania, the Fisheries Division of the Department of Primary Industry, and the C.S.I.R.O. Division of Fisheries and Oceanography. This project was conceived in 1960 at the annual Commonwealth/State Fisheries Conference and it is concerned with fish such as the Australian Salmon, Southern Bluefin Tuna, Striped Tuna, Southern Crayfish, Barracouta, King George Whiting and Scallops. Other marine research undertaken by the Department includes the following major aspects.

General Marine Research aims to develop and manage in-shore and demersal fisheries such as Snapper, Flathead, Scallops, Mussels, and Abalone. This programme includes many diversified activities ranging from the provision of artificial fishing reefs to the expansion of port facilities. The newly developed scallop fishery deserves special mention for it is the first fishery to be developed in Victoria on a known stock. Fishermen were advised where and how to fish and a very complete record of the fishery is being maintained.

In the Gippsland Lakes area, a very important Bream fishery suffered a serious decline which appeared to be caused by over-fishing associated with environmental changes. Extensive hydrological research has been undertaken and further work is now proceeding on the Bream population itself.

In Westernport Bay, a programme was originally conceived as a general biological and ecological survey of the Bay, but much of the emphasis has now turned to an investigation of the Australian Whiting (King George Whiting), one of Victoria's most popular sporting and commercial species. Special measures have been adopted to collect catch data from amateur anglers. Concurrently, the Department is carrying out a Benthic Survey (benthos = bottom living fauna and flora) as a biological measure of the effect of industrial development on the marine environment.

State Wildlife Reserves System

In 1959 the State Government set up a Wildlife Reserves Investigation Committee ". to consider what areas of land should be reserved for wildlife.". The land set aside by the Government on the advice of this Committee is managed primarily so that it will support the optimum populations of native mammals and birds.

These Wildlife Reserves, administered by the Game Management Section of the Fisheries and Wildlife Department, are classified into three groups :—

- (1) State Game Reserves are intended specifically for the management of game, usually gamebirds, and licensed shooting of game is permitted during a proclaimed open season. At all other times shooting is prohibited.
- (2) State Game Refuges provide habitat similar to that of Game Reserves and cater for similar wildlife populations, i.e., game animals, but shooting is prohibited throughout the whole year so that these areas provide a haven for game during an open season.
- (3) State Faunal Reserves are set aside for non-game animals such as koalas or mallee-fowl to ensure that the specific type of habitat on which each species depends, is preserved.

Associated with this Reserves System are areas which are managed for the benefit of wildlife under a joint scheme with another authority. These co-operative projects, as they are called, allow wildlife conservation works to proceed in these important areas while they are used primarily for other purposes, e.g., State forests or sewerage farms.

The "Serendip Wildlife Research Station" at Lara, near Geelong, is being developed in conjunction with the Reserves System. As well as being a main game research centre for the Department, it will also be used in the development of wildlife management techniques such as the growing of food plants for waterbirds.

Every year increasing demands are made on the land resources of the State, with the consequence that corresponding inroads are made into suitable wildlife habitat on Crown lands and private property. Much is said and written about the killing of native animals for sport, commerce, or the protection of farms and forests. However, these activities do not often affect the size of animal populations as seriously as is popularly imagined. Meanwhile the much more



FIGURE 14.

serious process of habitat destruction proceeds year after year but causes little public concern. Clearing and cultivation of farmland, drainage schemes, repeated and uncontrolled burning of forests, injudicious grazing of forest land, establishment of softwood plantations, all result in permanent changes in the amount of habitat available to wildlife.

Building up depleted wildlife populations is not the only concern of the Department. From time to time some species breed so efficiently that they actually overstock the available habitat and it is often as a result of such overstocking that animals cause damage to other valuable resources (See Victorian Year Book 1962, pages 544 to 546). A wild animal population which outstrips the capacity of the habitat to feed or shelter it, soon becomes an unhealthy population and so it is in the interest of the animals themselves that their numbers should not be allowed to reach the stage when they spill over from the reserves which have been established for them.

Until recently most, though by no means all, of Victoria's native birds and mammals had managed to survive because, quite by chance, there was enough land and habitat of various types "left over" to provide them with living space after the other needs of the human community had been met. However, with the great increases of population and economic development in Victoria in the past twenty years, it is no longer certain that enough of these unspoiled lands will remain to provide sufficiently diverse and extensive habitats catering for animals with a wide range of environmental requirements. Reservation of land for wildlife will now be planned on an increased knowledge of native animals and their precise ecological needs.

In addition to species survival, it is important to conserve wildlife for reasons which will benefit man himself. Wildlife is a resource which is useful to man whether it be for food or scientific study, or commerce or tourism or sport, or for its role in maintaining a stable biotic community, or for recreation and aesthetic enjoyment.

Wildlife, 1962

Introduced Fish, 1963

Commercial Fisheries, European Carp, 1964

Freshwater Research, 1965

Fisheries Statistics

The statistics of production shown in the following tables are in terms of recorded landed weight. Some species are landed in a headed, headed and gutted, or otherwise reduced condition; others are landed whole. In interpreting fisheries statistics, allowance should be made for the incomplete coverage. Returns are collected from licensed professional fishermen only, and as a result the published totals fall short of total fish production to the extent of the catch by amateur fishermen, the commercial catch by persons not licensed as professional fishermen, and unrecorded catch by professional fishermen.

The following table shows certain particulars about the fishing industry in Victoria for the years 1959-60 to 1963-64 :—

VICTORIA—FISHERIES : MEN AND BOATS EMPLOYED : QUANTITY AND GROSS VALUE OF TAKE

Year Ended 30th June—	Number of Men	Boats Employed		Value of Nets and Other Plant	Recorded Production*			
		Number	Value		Fish		Crayfish	
					Quantity	Value	Quantity	Value
			\$'000	\$'000	'000 lb.	\$'000	'000 lb.	\$'000
1960	897	657	2,230	396	12,700	3,448	1,500	600
1961	1,002	714	2,414	440	12,140	3,118	2,069	966
1962	1,045	794	2,692	554	13,065	3,150	1,676	810
1963	1,004	784	2,748	634	12,611	2,938	1,531	766
1964	1,541	917	3,825	763	14,134	3,532	1,317	691

* Includes catch by Victorian fishermen in Tasmanian waters.

The following table shows the production of the principal types of fish in Victoria for the years 1959-60 to 1963-64 :—

VICTORIA—FISH : PRODUCTION OF PRINCIPAL TYPES ('000 lb. Landed Weight)

Type of Fish	Year Ended 30th June—				
	1960	1961	1962	1963	1964
Marine Fish—					
Australian Salmon ..	1,951	1,050	636	1,023	1,649
Barracouta ..	3,004	3,608	3,308	2,588	2,034
Bream	128	225	329	195	218
Flathead	1,815	1,880	2,318	1,832	2,213
Garfish	211	310	479	503	476
Morwong	71	138	318	277	505
Mullet	769	710	964	978	960
Pilchard	280	192	349	308	639
Shark*	1,488	1,873	2,181	2,731	2,987
Snapper	153	132	279	303	335
Whiting	464	537	402	300	255
Other†	2,176	1,265	1,258	1,369	1,630
Total Marine Fish..	12,510	11,920	12,821	12,407	13,901
Freshwater Fish ..	190	220	244	204	233
Total Fish ..	12,700	12,140	13,065	12,611	14,134

* Includes catch by Victorian fishermen in Tasmanian waters.

† Includes quantities of shark livers for oil extraction.

Mining

Since the discovery of gold in Victoria in 1851, mining has played a significant part in the State's development. The change from alluvial to reef mining developed gradually following the first discoveries of gold. By the end of the century gold mining had decreased in importance relative to other primary and secondary industries.

Although Victoria mines lime, black coal, clays, and other products, it was the discovery of brown coal which made the most important mining impact in this century. The State Electricity Commission's exploitation of brown coal in the Latrobe Valley has become the basis of Victoria's power generation, which in turn has been an important factor in the large development of secondary industry during the last three decades.

Mining in Victoria, 1964

Underground Water, 1964

Mineral Production

The mineral production of the State, as recorded by the Mines Department, from lands occupied under the Mines Act (excluding stone raised in quarries and salt) for the years ended December, 1963 and 1964, is shown in the following table :—

VICTORIA—MINERAL PRODUCTION

Minerals	1963		1964	
	Quantity	Value	Quantity	Value
Precious Metals—	fine oz.	\$	fine oz.	\$
Gold	24,668	853,950*	21,284	737,448*
Silver	546	550	646	646
Other Minerals—	ton		ton	
Bauxite	2,157	17,138	1,766	11,606
Coal, Black	50,481	588,856	47,058	544,400
Coal, Brown	18,456,445	16,157,532	19,034,792	17,303,974
Copper Concentrate	10.5	2,470†	38	4,918
Copper Ore	72.3		17	
Fire Clay	31,913	59,168	28,050	53,774
Gypsum	114,503	202,276	104,212	234,934
Kaolin and Other White Clays	713,379	1,227,366	600,467	1,147,510
Limestone	1,227,350	1,212,172	1,371,479	1,300,708
Other	612	38,322	812	62,276

* Includes gold subsidy, \$86,534 for 1963 and \$77,024 for 1964.

† Includes copper bounty \$106 for 1963 and \$42 for 1964.

The following table shows the average annual production and value of black and brown coal for each of the five year periods from 1921 to 1955 and the production and value for each of the years 1956 to 1964 :—

VICTORIA—COAL PRODUCTION AND VALUE*

Period	Black Coal		Brown Coal	
	Production	Value	Production	Value
	tons	\$'000	tons	\$'000
1921-1925	520,705	1,184	258,094	124
1926-1930	668,177	1,786	1,515,592	386
1931-1935	472,030	888	2,445,215	512
1936-1940	324,903	568	3,608,751	712
1941-1945	286,277	818	5,010,555	1,052
1946-1950	156,290	722	6,648,430	2,404
1951-1955	143,535	1,590	8,728,116	7,186
1956	118,827	1,336	10,559,801	9,288
1957	111,569	1,112	10,740,989	10,454
1958	108,359	1,056	11,643,629	10,836
1959	87,715	910	13,040,717	12,246
1960	77,995	836	14,982,990	13,690
1961	66,363	718	16,279,168	15,444
1962	56,721	632	17,137,438	15,682
1963	50,481	588	18,456,445	16,158
1964	47,058	544	19,034,792	17,304

* Value of output at the mine.

Offshore Drilling for Petroleum in Victoria

Permits to search for petroleum in seas off the Victorian coast were first taken up in 1959, and active exploration of the continental shelf areas commenced in 1960. Exploration commenced with a regional aeromagnetic survey to delineate the extent of the sedimentary basins in the shelf area. This was followed by reconnaissance marine seismic surveys which established the broad picture of geological structure and the thickness of sediments present.

At this stage an exhaustive study of all available geological and geophysical data relating to onshore and offshore parts of the Gippsland basin was made and an appraisal of the petroleum potential of certain Gippsland shelf tenements was prepared. A floating rig was brought out from the United States of America to carry out drilling operations. Concurrently, further seismic work was carried out in areas of special interest to finalize the location of drill sites. This work and other appraisal studies enabled the site for Australia's first offshore well to be selected. The well was spudded on 27th December, 1964. On 18th February, 1965, a major show of petroliferous gas was encountered in this well at a depth of approximately 4,350 feet. Information as to the likelihood of production from this well will not be available until testing is carried out on completion of drilling at a depth of about 10,000 feet.

Appraisal studies of other offshore areas have been made or are currently in progress for the Bass basin which is partly in Victorian and partly Tasmanian shelf waters. Additional wells are planned for the Gippsland basin and Bass basin on the continental shelf immediately following completion of the present well.

Oil Exploration in Victoria from 1924 to 1963, 1965

Quarrying

General

In its early years, Victoria developed its quarrying industry around Melbourne and at Malmsbury to meet its building and waterfront requirements. Since then the industry has expanded into multi-million dollar projects ; in fact, development of the mining industry in Victoria since 1960 has been characterized by marked progress in the open-cut mining of construction materials. The value of this output is greater than all other quarry production including brown coal.

The trend to mechanization in the quarrying of construction materials has enabled production costs to be held within reasonable limits against steeply rising labour costs. At the same time, the increased production capacity of these industries has enabled supplies to be maintained for a continuously expanding economy. Highway and freeway construction programmes have made great demands on first quality aggregates and the increased programmes of public works, homes, and schools, have made heavy demands on urban extractive industries. Some of the large quarrying projects are of a temporary nature to provide material for dam-construction in the more sparsely populated parts of the State.

Quarried materials include sand and gravel, which may be washed and sized into various specified gradings, and crushed rock for concrete, roads, and railway ballast. Limestone is mined chiefly for the Portland cement, lime, paper, and metallurgical industries, but it is often used as road-making material in regions where there is a deficiency of the usual materials. The quarrying of limestone, one of the State's most important economic minerals, has risen steeply since 1960. Most of this output is used for cement manufacture.

Uses of Material

Crushed Rock

Rock types suitable for aggregate materials include basalt (bluestone), toscanite, rhyolite, granite, chert, sandstone, travertine, limestone, hornfels, schist, and gneiss.

Since the requisite physical and chemical properties are found in most types, proximity to markets tends to determine the intensity of development. On the other hand, where hard rock only occurs many hundreds of feet below the surface, as it does in the Mallee-Wimmera regions, development of quarries is likely to take the form of a ring extending through the Grampians, St. Arnaud, and Charlton.

Sand and Gravel

Sands are used in every construction undertaking in every town, while needs of such undertakings as dam construction, although of a temporary nature, require vast quantities of sands.

Limestones, Marble, and Shell Grit

Calcium carbonate has a variety of uses, including metallurgical flux, Portland cement, lime, chemicals, sanitation, glass-manufacture, and bitumen filler. In Victoria, by far the greatest use of lime is for the manufacture of Portland cement. Other important uses are lime

manufacture for building mortar and plaster, soil stabilization in highway construction, and soil conditioners for agricultural purposes. Pure calcitic limestones are used for the manufacture of chemicals and glass.

Light Weight Aggregates

A field that is likely to expand in the future is the manufacture of light weight aggregate materials for concrete and light weight fired clay ware. When certain shales are fired rapidly in rotary kilns, these are bloated into low density aggregates. Another possible source of light weight aggregate is basaltic scoria occurring in the scoria cones north-west of Melbourne, around Geelong, and in the Western District.

Information in the following table has been obtained from "regular" quarries which are known to have a fixed plant and which are in permanent production, and from mines producing construction materials as by-products of their main activity.

VICTORIA—CONSTRUCTION MATERIALS

Year Ended 31st December—	Number of Returns	Production					Local Value of Production
		Sand	River Gravel and Gravel Boulders	Dimension Stone	Crushed and Broken Stone	Other Quarry Products	
		'000 cub. yds.		tons	'000 cub. yds.		\$'000
1959	121	948	107	4,387	4,970	489	11,684
1960	126	911	125	4,058	5,869	425	13,162
1961*	252	1,701	661	6,877	7,903	819	18,434
1962	254	2,054	425	9,181	7,622	744	17,784
1963	275	2,134	401	10,147	7,866	936	17,270

* From 1961 figures are not comparable with previous years. In 1961 increased coverage involving an additional 126 informants (59 being mainly sand and gravel quarries) accounted for sand 678,000 cub. yds.; river gravel and gravel boulders, 471,000 cub. yds.; dimension stone, 3,881 tons; crushed and broken stone, 1,013,000 cub. yds.; other quarry products, 437,000 cub. yds.; with a total additional value of \$3,210,000.

In addition to the production set out in the preceding table, there is a considerable quantity of material "won" by contractors operating shallow pits for or on behalf of Local Government Authorities, and by exploiting stone outcrops, mine tailings, &c. This itinerant activity

was first covered by a statistical collection for 1961. However, the statistics are available only from 1962. Reported production data for the years 1962 and 1963 are :—

VICTORIA—CONSTRUCTION MATERIALS : ITINERANT ACTIVITIES

Type of Material	Year Ended 31st December—	
	1962	1963
	'000 cu. yds.	
Sand	225	311
Gravel and Gravel Boulders	1,976	2,533
Crushed and Broken Stone	718	1,453
Other Quarry Products	524	914
	\$'000	
Local Value	982	1,659

Value of Production

General

The value of production as estimated in the following tables is based to a large extent on returns received annually from individual producers throughout the State. As a measure of total production it is incomplete, as it does not include the building and construction industry. It also omits factories employing less than four hands (unless power-driven machinery is used) and excludes agriculturists with holdings of less than 1 acre.

A detailed account of the period covered for individual rural industries is given on page 487. Except in the case of mining and quarrying, statistics for the non-rural industries refer to the year ended 30th June. Statistics for mining and quarrying relate to the year ended 31st December of the first year shown.

Gross Value

Gross value is defined as the value placed on recorded production at the wholesale price realized in the principal market. In cases where primary products are absorbed locally, or where they become raw material for secondary industry, these points are presumed to be the principal markets. Care is taken to prevent, as far as possible, all overlapping or double counting. The primary value of dairy production, in accordance with the above definition, is the price paid at the factory for milk or cream sold by the farmer ; the value added by the process of manufacturing into butter, &c., is included in manufacturing production.

VICTORIA—GROSS VALUE OF PRIMARY PRODUCTION
(\\$'000)

Industry	1959-60	1960-61	1961-62	1962-63	1963-64
Agriculture	184,822	265,836	230,224	253,468	272,807
Pastoral	320,276	278,828	287,760	318,914	382,211
Dairying*	140,942	144,008	143,176	157,136	172,560
Poultry and Bees	48,654	50,856	47,454	46,688	52,945
Trapping	7,498	6,312	6,048	5,868	6,373
Forestry	30,061	29,531	27,632	27,437	30,592
Fisheries	4,090	4,128	4,032	3,764	4,835
Mining	29,870	32,534	39,166	40,016	40,838
Total Primary Industries	766,214	812,032	785,494	853,291	963,161

* Includes Subsidy—1959-60, \$12,408,000 ; 1960-61, \$13,420,000 ; 1961-62, \$13,088,000 ; 1962-63, \$13,572,000 ; 1963-64, \$13,690,000.

Local Value

The gross value of production, less costs of marketing (freight, cartage, brokerage, commission, insurance, and containers), represents the gross production valued at the place of production, that is, local value, details of which are shown in the following table :—

VICTORIA—LOCAL VALUE OF PRIMARY PRODUCTION
(\\$'000)

Produce	1959-60	1960-61	1961-62	1962-63	1963-64
Agriculture—					
Barley	4,084	4,728	3,978	4,720	3,438
Maize	226	212	178	226	216
Oats	7,146	9,820	8,918	14,314	11,034
Wheat	44,842	81,442	73,342	85,118	93,039
Onions	1,684	1,256	1,300	1,078	919
Potatoes	9,932	16,626	10,756	3,986	13,432
Other Vegetables	17,406	18,820	16,208	15,106	15,876
Hay and Straw	27,672	41,708	27,468	39,850	34,703
Fruit—					
Orchards	15,828	20,168	20,846	17,560	22,016
Vineyards	12,376	14,472	15,920	12,678	21,875
Other Crops	17,064	19,700	18,562	21,112	23,389
Total ..	158,260	228,952	197,476	215,748	239,938

VICTORIA—LOCAL VALUE OF PRIMARY PRODUCTION—*continued*
(\$'000)

Produce	1959-60	1960-61	1961-62	1962-63	1963-64
Pastoral—					
Wool	135,516	122,190	126,950	137,980	187,157
Sheep, Slaughtered ..	55,532	47,310	40,964	44,764	46,523
Cattle, Slaughtered ..	99,782	81,926	86,034	102,434	112,071
Total ..	290,830	251,426	253,948	285,178	345,751
Dairying—					
Whole Milk Used for—					
Butter	61,658	61,592	61,422	71,368	77,246
Cheese	8,658	9,484	9,802	11,210	12,851
Condensing, Con- centrating, &c. ..	13,334	12,140	12,200	12,284	14,065
Human Consump- tion and Other Purposes ..	26,244	27,104	28,476	28,894	32,786
Subsidy Paid on Whole Milk for Butter and Cheese ..	12,408	13,420	13,088	13,572	13,690
Pigs, Slaughtered ..	12,920	14,354	11,546	13,410	15,217
Total ..	135,222	138,094	136,534	150,738	165,857
Poultry and Bees—					
Eggs	29,012	30,348	28,276	28,946	34,659
Poultry	13,530	13,790	12,370	11,794	12,009
Honey and Beeswax	856	638	830	480	1,151
Total ..	43,398	44,776	41,476	41,220	47,819
Trapping, &c.—					
Rabbits and Hares ..	5,120	4,620	4,570	4,332	4,444
Rabbit and Hare Skins, &c. ..	1,864	1,270	1,050	1,168	1,470
Total ..	6,984	5,890	5,620	5,500	5,914
Forestry—					
Sawmills	20,314	18,450	18,136	18,884	19,543
Hewn Timber ..	2,852	2,716	2,522	2,202	2,490
Firewood	5,297	6,525	5,444	4,943	6,682
Bark for Tanning ..	172	116	92	108	134
Other	72	72	66	64	72
Total ..	28,706	27,879	26,260	26,200	28,920

VICTORIA—LOCAL VALUE OF PRIMARY PRODUCTION—*continued*
(\$'000)

Produce	1959-60	1960-61	1961-62	1962-63	1963-64
Fisheries—					
Fish	2,990	2,694	2,714	2,528	3,049
Crayfish	520	840	706	670	606
Oysters	2	4	2	2	2
Other	30	36	60	50	545
Total ..	3,542	3,574	3,482	3,250	4,202
Mining—					
Gold	1,170	942	940	946	854
Coal—					
Black	910	836	718	632	589
Brown	12,246	13,690	15,444	15,682	16,158
Other Metals and Minerals ..	3,860	4,014	3,630	3,990	4,308
Quarrying* ..	11,684	13,052	18,434	18,766	18,929
Total ..	29,870	32,534	39,166	40,016	40,838
Total Primary Industries	696,813	733,126	703,962	767,851	879,238

* Figures for 1962-63 and 1963-64 not strictly comparable with those for earlier years. See section on Quarrying, pages 546-548.

Net Value of Production

Net value of production is computed by subtracting from local value the cost of materials used in the process of production. These materials include stock feed, seed, manures, power, petrol, kerosene, other oils, dips, sprays, and other costs. No deductions have been made for depreciation or certain maintenance costs. The net value of production is the only satisfactory measure to use when comparing or

combining the value of primary industries with those of other industries. Details for primary industries and manufacturing are shown in the table below :—

VICTORIA—NET VALUE OF PRODUCTION
(\$'000)

Division of Industry	1959-60	1960-61	1961-62	1962-63	1963-64
Rural—					
Agriculture ..	137,824	208,062	176,490	193,972	218,136
Pastoral	271,260	232,362	231,056	265,126	323,696
Dairying	94,938	101,894	87,044	110,134	121,385
Poultry	27,300	28,692	24,878	24,812	30,104
Bee-farming ..	856	638	830	480	1,151
Total Rural ..	532,178	571,648	520,298	594,524	694,473
Non-rural	63,432	63,660	67,464	67,372	72,686
Total Primary ..	595,611	635,309	587,762	661,897	767,159
Manufacturing ..	1,384,334	1,417,546	1,440,644	1,601,742	1,750,478
Total All Industries ..	1,979,945	2,052,855	2,028,406	2,263,639	2,517,637